

**Annual Report of Plan of Work  
Wisconsin Agricultural Experiment Station**

**College of Agricultural and Life Sciences  
University of Wisconsin, Madison**

**Federal Fiscal Year 2001  
Research Activities**

**Filed February 28, 2002**

Certification: Margaret Dentine, Executive Director, Wisconsin Agricultural Experiment Station

## Table of Contents

Wisconsin Agricultural Experiment Station .....	1
Foreword .....	4
Choice of reporting .....	4
Point of contact .....	4
Additional sources of reporting .....	4
Background .....	5
Structure .....	5
Operating Philosophy .....	6
Integrated Research and Extension .....	6
Multistate Research .....	6
Program Evolution .....	7
Research Activity in Support of National Goals and Themes .....	8
Goal 1. An agricultural system that is highly competitive in the global economy .....	10
Executive summary .....	10
Updated project list for FY01 .....	10
Impact Statements and Selected Results .....	19
Bacteria may help reduce fertilizer needs and still improve corn yields .....	19
Waste fish can help landfills and babies .....	19
Poultry stem cells .....	20
New cranberry to brighten future for growers .....	21
Industrial hemp won't replace traditional crops .....	21
Fruit protection after harvest .....	22
New pastures for graziers .....	22
Goal 2. A safe and secure food and fiber system .....	24
Executive summary .....	24
Updated project list for FY01 .....	24
Impact Statements and Selected Results .....	26
Natural plant compounds make germ-killers more effective .....	26
Protecting food handling equipment from dangerous bacteria .....	26
Goal 3. A healthy, well-nourished population .....	28
Executive summary .....	28
Updated project list for FY01 .....	28
Impact Statements and Selected Results .....	31
Rural access to health care .....	31
Goal 4. Greater harmony between agriculture and the environment .....	32
Executive summary .....	32
Updated project list for FY01 .....	32
Impact Statements and Selected Results .....	37
Dishing up local foods .....	37
Making Bt more effective against gypsy moth .....	38
Goal 5. Enhanced economic opportunity and quality of life for Americans .....	39

Executive summary.....	39
Updated project list for FY01 .....	39
Impact Statements and Selected Results.....	43
Dynamics of farm family labor.....	43
Evaluation of success of multistate, multi-institutional and multidisciplinary activities .....	43
Serving the entire community .....	46
Stakeholder Input Process.....	47
Areas of Identified Research Need for Wisconsin.....	49
Program review process.....	49
Integrated Research and Extension Activities .....	51
Actual Integrated R&E Expenditures (Form CSREES-REPT (2/00) .....	52
Appendices.....	53
Appendix A – Science Report and CALS Quarterly (3 issues).....	53
Appendix B – CALS Advisory Committee membership .....	54
Appendix C – Dean’s roundtable meetings .....	55

# **Annual Report of Plan of Work Wisconsin Agricultural Experiment Station**

## **Foreword**

### ***Choice of reporting***

The Wisconsin Agricultural Experiment Station, as an 1862 Land Grant Institution, has chosen to file a report on research activities for the Plan of Work at the University of Wisconsin (UW). University of Wisconsin-Extension will be reporting in a separate document on extension activities. Institutions involved with research work include the University of Wisconsin-Madison (College of Agricultural and Life Sciences, School of Veterinary Medicine and School of Human Ecology) and the University of Wisconsin- Stevens Point. Programs included in this annual report of accomplishments are those funded by formula funds provided by Hatch Act, McIntire-Stennis Cooperative Forestry Research Program, and Animal Health and Disease Research Program.

### ***Point of contact***

All correspondence regarding this report should be directed to:

Dr. Margaret Dentine  
Executive Director, Wisconsin Agricultural Experiment Station  
College of Agricultural & Life Sciences  
1450 Linden Drive  
Madison, WI 53706-1562

Phone: (608) 262-2397

Fax: (608) 265-9534

Email: [mrdentine@cals.wisc.edu](mailto:mrdentine@cals.wisc.edu)

### ***Additional sources of reporting***

Reporting of project titles and objectives as well as human resources have been filed in the CRIS system at USDA by means of the AD-416 and AD-417s. Expenditure data and human resources have been filed with the USDA in the CRIS system by means of the AD-419s. Annual progress reports (including impacts) and final reports have been filed with the USDA-CRIS system using the AD-421s. Impact statements for FY01 have been filed by the Wisconsin Agricultural Experiment Station with the USDA-CSREES Impact database and are included here where appropriate.

Access to the CRIS system of reporting and search capabilities is available at

<http://cris.csrees.usda.gov/>

The original Plan of Work for Wisconsin's research activities was filed July 15, 1999 and is available in pdf format at

<http://www.cals.wisc.edu/research/PlanofWork.pdf>

Highlights of research, extension and education programs are available at the following websites or print copies have been included with this report

2001-2002 Science Report – included as Appendix A

Title: "Education at Work"

Selected stories at

<http://www.cals.wisc.edu/>

CALS Quarterly – 3 issues included in Appendix A

News releases and stories:

<http://www.cals.wisc.edu/media/news/>

## **Background**

### *Structure*

The Director of the Experiment Station is Dean Elton Aberle of the College of Agricultural and Life Sciences (CALs) who has designated an Executive Director, Margaret Dentine (Associate Dean, Research Division, CALs) to be responsible for research operations. An Associate Director, Kevin McSweeney is responsible for the McIntire-Stennis Program and other research involved in natural resources. The CALs Research Division is responsible for reviewing proposals, making funding decisions and administering grants in cooperation with the University of Wisconsin-Madison School of Veterinary Medicine, the University of Wisconsin-Madison School of Human Ecology and the University of Wisconsin-Stevens Point College of Natural Resources.

CALS is composed of 21 departments with a large number of intra-college and inter-college centers, institutes and programs. CALs' mission is to improve the quality of life by discovering; critically analyzing and sharing knowledge in food and agriculture, the life sciences, natural resources and environmental stewardship, and rural community development and to offer strong, research-based education that is responsive to public needs and social, economic and environmental concerns. Additional information on the organization and personnel of UW-CALS is available on the college website at

<http://www.cals.wisc.edu/>

Within the College of Agricultural and Life Sciences, the Research Advisory Committee, a faculty committee of 12 members appointed by the Associate Dean for Research with ex-officio members of the Assistant Dean for Research and the Director of the School of Natural Resources meets regularly to discuss research issues. This committee recommends research policy guiding distribution and use of formula funds and is the primary peer review committee for Hatch and McIntire-Stennis proposals. The committee recommends policies and procedures that have been implemented to distribute formula funds on a competitive process.

### ***Operating Philosophy***

The Wisconsin Experiment Station is committed to the concept of investigator-driven and peer-reviewed research activities. The general philosophy in allocating formula funds is to provide support for specific reviewed projects rather than to distribute block amounts to faculty or departments. At the University of Wisconsin, faculty appointments are funded with state appropriations thus releasing nearly all formula funding for project support. Expenditures are allowed under a series of guidelines annually reviewed by a faculty committee. Matching funds come primarily from state support of salaries for investigators and research staff.

Formula funds are distributed to approved projects with yearly budgets. Approximately 200 projects are funded with formula funds each year with budgets that include personnel (mainly graduate students) and supplies. Funding of capital equipment items, some of which may be shared by several projects, are prioritized by departments and funded in a separate exercise. Travel to multi-state research meetings is provided for the official representative from a central pool of funds.

### ***Integrated Research and Extension***

Extension has its own Chancellor and is a separate “campus” within the University of Wisconsin System. CALS faculty with Extension specialist appointments are housed at the Madison campus with an annual Extension transfer of funding for portions of their appointments. These faculty are fully integrated into CALS departmental teaching and research programs and can apply for research project support under the formula-funded competitions listed above. County-based Extension faculty members are participants in research teams, but are not principal investigators for projects supported by formula funds. Thus the funding of integrated research-extension efforts is accomplished largely through salary support of Extension faculty and project support from competitive awards of research formula funds. In the following tables, the indication of integrated research /extension activities is based on projects where one or more of the principal investigators has an official extension appointment.

### ***Multistate Research***

We have adopted by reference the national Coordinated Multi-state Research Framework for fulfillment of our obligations to the AREERA's multistate and multidisciplinary activities. More details are available on the WWW at

<http://www.agnr.umd.edu/users/NERA/workshop/RPAFramework.html>

Reporting of Station accomplishments and impacts from multi-state projects are included in federal filing of the SAES-422 reports on these projects available on the CRIS system. Listing of states cooperating on these projects have already been filed with USDA Partnership office following the peer and merit review and approval by the Regional Directors multistate committees. In the following listings under the Goal headings, these projects are designated as multi-state and their regional project designations are given. Financial statements of expenditures are directly from the Wisconsin station reports filed as AD-419s.

### ***Program Evolution***

Programs in the Wisconsin Research Plan of Work were composed of a number of projects with individual review and reporting. Program duration may be extended for multiple years, but the contributing projects are a constantly shifting portfolio that can be quickly redirected. Projects have been approved for periods of one to five years with the majority on a four-year cycle. Proposals for new projects require a discussion of the results from previous formula fund support which is used as part of the criteria for ranking proposals and for evaluating the ability of the team to complete the research project successfully. Although some multi-state projects have been continuing for more than 10 years, revised proposals are required for review and approval at least every 5 years. Each year, approximately 25 percent of the research portfolio are shifted in new directions.

This process of continual re-examination of our portfolio allows us to address short-term, intermediate term and long-term issues. A small number of approved projects may be started at mid-year as new faculty members are hired or emerging problems trigger an early start at the discretion of the Associate Dean for Research. These processes ensure that projects are pertinent to the CSREES national goals and focus on current state research needs. In the project listing under the goals, projects that have been added to the portfolio are marked with an asterisk (\*) and printed in bold to highlight the new additions since filing of last year's annual report. Projects that have been completed are no longer listed.

## Research Activity in Support of National Goals and Themes

The five sections that follow relate a portion of the Wisconsin Agricultural Experiment Station research effort to the five national goals established by the U.S. Department of Agriculture for the national planning and reporting process. Between 500 and 600 research projects are underway in the College during the course of a year, ranging from the most basic of scientific studies to those that are highly applied. The reports that follow concentrate on those studies that are done as part of formula funded research (Hatch, McIntire-Stennis, and Animal Health). Most of these studies are of a more applied nature, and are significant sources of new science-based information for Wisconsin Cooperative Extension programs. Of the approximately 100 million in expenditures made through the College's research division, these formula funded research projects represent about \$5 million of the total.

In using the nationally devised goals and themes as the reporting framework, it also should be noted that research projects frequently do not fit neatly and exclusively into one and only one category. In many (perhaps most) instances, a research project relates to multiple goals and themes. Because of this difficulty, the assigning of a project to a particular goal is somewhat artificial. Research projects; like the agricultural, natural resource, and community issues they address; are frequently at the intersecting points of disciplines and interests. We view this interdisciplinary nature of our research efforts as a strength.

Of the studies selecting for reporting in this document, the largest portion (127) relate to the goal of "An agricultural system that is highly competitive in the global economy." This included 26 projects that were multi-state interdisciplinary projects and 28 that were integrated research/extension projects. The concentration of projects in this goal area is expected for two reasons –1) the nature of the research funding sources being reported are directed toward such problem areas, and 2) the state's agricultural economy is large (between \$5 billion and \$6 billion cash farm receipts a year, with total economic impact near \$20 billion a year) and dependent on new research knowledge to keep it competitive not only with international trade but with other regions of the United States producing similar food and fiber commodities. Among the research titles presented in this section are a broad array of studies that address the extreme breadth of Wisconsin agriculture. We have a highly diverse livestock and plant agriculture that stresses limited research resources to the limit.

The second largest number of research projects is reported under the goal of "Greater harmony between agriculture and the environment." There are 38 project reported here, with 9 of them being multi-state, interdisciplinary studies, and 13 integrated research/extension projects. Producing agricultural commodities in ways that are sustainable and protective of the natural resource base and the broader environment is one of the largest challenges facing Wisconsin farmers. The state's cash farm receipts derive overwhelmingly from livestock enterprises, with dairying being by far the most important. Managing livestock wastes and cycling them safely and productively through the various cropping systems is the most urgent challenge. Non-point pollution regulations are increasing from both the state and federal levels. A large number of studies in this reporting section relate to the handling of waste streams from livestock and other state industries. Beyond the waste stream challenge are many other environmental challenges relating to proper use of chemical fertilizers and reduced pesticide use. Because Wisconsin has a huge tourist industry that relies heavily upon quality land,

water, air, landscapes, and fish and wildlife populations, the impacts of environmental protection through proper agricultural production practices go well beyond agriculture.

Under the goal of “Enhanced economic opportunity and quality of life for American” there are a total of 21 projects reported – the third largest number under a goal heading. Seven of these were multi-state, interdisciplinary projects, and four were integrated research/extension projects. Although most of these studies are reported under Objectives 5.1 (increasing capacity of communities and families to enhance their own economic well being) and 5.2 (increasing capacity of communities, families and individuals to improve their own quality of life) a project not assigned to a particular objective heading is noteworthy. This project is a north central regional project (NC-208) that looks at agricultural research funding trends and impacts of those trends on agenda. One of its major conclusions is that as public sources of research funding (particularly in the agricultural sector) experience no real growth or declines in terms of inflation corrected buying power, researchers turn increasingly to non-governmental (industry and other private sources) funding.

Under the goal of “A healthy, well-nourished population” are reported 13 projects, and under the goal of “A safe and secure food and fiber system” are reported 7 projects. If this report covered College research projects beyond those funded with formula research funds, there would be a much larger number of projects with relevance to human nutrition. About half of the federal competitive grant funding coming to the College is provided by the National Institutes of Health, and a large portion of those studies relate to human nutrition and health. The food safety issue is also of great importance to the College in spite of the small number of research projects reported here. Much of the food safety research is funded through the College’s Food Research Institute, and nearly all of the Institute’s funding derives from private sources. Again, because this report concentrates on formula funding sources, this privately funded research effort is not captured here.

Finally, this report does not attempt to sort all of the research activity into key reporting themes. Instead, examples of research impacts are offered, and relevant themes addressed by the examples are listed along with focus areas from the CSREES budget.

## **Goal 1. An agricultural system that is highly competitive in the global economy.**

### ***Executive summary***

Under this goal, there were 127 projects including 26 that were multistate interdisciplinary projects, 10 were McIntire-Stennis projects, 6 were Animal Health projects and 28 were integrated research/extension projects. Although the largest number of projects under the goals are classified as Goal 1, many of these projects address other goals as well. For instance, a newly added project, WIS04505, “Cooperation among Woodland Owners: A case study of Organizational Forms and Participant Motivations” has relevance to Goal 4.3 (To improve decision-making on public policies related to agriculture and the environment).

Wisconsin is committed to continually changing its portfolio of research. Thirty-two new projects have been added including those on animal vaccine development, forest fragmentation, cellular signaling in microbes and animals, disease resistance processes in plants, alfalfa biofarming and agricultural marketing forecasts. Meetings with our stakeholders have emphasized the needs of the green industry, alternatives to antibiotics and chemical controls, rural development, alternative crops and agricultural product economics. Newly added projects indicate that faculty are responding to stakeholder needs.

### ***Updated project list for FY01***

New projects are printed in **bold**. Note that recent reclassification of projects has moved some projects into goals different from those previously listed in the Plan of Work. Some projects address several goals but are listed in only one.

Principal Investigator	Title of Project	Hatch Total (Regular & Multistate)	Hatch Multistate	McIntire/Stennis	Animal Health	Extension Activity	Total Formula Funds	Total F.T.E
<b>Agriculture Production System that is Highly Competitive in the Global Economy</b>								
<b>Objective 1.1: To produce new and value-added agricultural products and commodities</b>								
Hartel, R. W.	IMPROVEMENT OF THERMAL PROCESSES FOR FOODS (NC-136)	X	X					
Roper, T. R.	MULTIDISCIPLINARY EVALUATION OF NEW APPLE CULTIVARS (NE-183)	X	X				X	
Casler, M. D.	CELL WALL CONCENTRATION AND COMPOSITION IN REGULATING BROMEGRASS NUTRITIONAL VALUE AND FUNGAL DISEASE	X						
Parkin, K. L.	LIPID MODIFICATION MEDIATED BY POTATO LIPOLYTIC ACYL HYDROLASE (PATATIN)	X						
Steele, J. L.	TYRAMINE ACCUMULATION IN CHEDDAR CHEESE: MECHANISM OF CONTROL	X						
Young, R. A.	ENHANCED UTILIZATION OF WOOD FIBERS AND POLYMERS THROUGH PLASMA MODIFICATION				X			
Osborn, T.	ALFALFA POPULATION IMPROVEMENT USING NOVEL GERM PLASMA	X						
Claus, J. R.	INHIBITION OF THE PINK DEFECT IN COOKED, UNCURED POULTRY PRODUCTS	X						
Gunasekaran, S.	RHEOLOGIC AND THERMAL PROPERTIES OF MIXED BIPOLYMERS GEL SYSTEMS	X						
Lucey, J. A.	INVESTIGATION INTO IMPROVING THE TEXTURE AND FUNCTIONALITY OF FERMENTED MILK PRODUCTS	X						
Plhak, L. C.	IMMUNOCHEMICAL APPROACH FOR THE STUDY OF PLANT LIGNANS	X						
Damodaran, S.	THERMODYNAMIC INCOMPATIBILITY AND PHASE SEPARATION OF PROTEINS AT THE OIL-WATER INTERFACE AND ITS EFFECT ON EMULSION STABILITY	X						
Richards, M. P.	INVESTIGATION INTO INHIBITION OF HEMOGLOBIN-MEDIATED LIPID OXIDATION IN COOKED AND UNCOOKED MUSCLE FOODS	X						
Cropp, R. A.	ADOPTION OF ALFALFA BIOFARMING TO ENHANCE RURAL ECONOMIC DEVELOPMENT	X					X	
	<b>Total:</b>	<b>\$342,214</b>	<b>\$29,015</b>	<b>\$20,836</b>	<b>\$0</b>	<b>\$40,418</b>	<b>\$363,050</b>	
<b>Objective 1.2: To increase the global competitiveness of the U. S. Agricultural production system</b>								
Bitgood, J. J.	ADVANCED TECHNOLOGIES FOR THE GENETIC IMPROVEMENT OF POULTRY (NC-168)	X	X					

Principal Investigator	Title of Project	Hatch Total (Regular & Multistate)	Hatch Multistate	McIntire/Stennis	Animal Health	Extension Activity	Total Formula Funds	Total F.T.E
Palmer, R. W.	MANAGEMENT SYSTEMS FOR IMPROVED DECISION MAKING AND PROFITABILITY OF DAIRY HERDS (NG 119)	X		X			X	
Greaser, M. L.	MOLECULAR MECHANISMS REGULATING SKELETAL MUSCLE GROWTH AND DIFFERENTIATION (NC-131)	X		X				
Wiltbank, M. C.	METHODS TO INCREASE REPRODUCTIVE EFFICIENCY IN CATTLE (NC-113)	X		X				
Roper, T. R.	ROOTSTOCK AND INTERSTEM EFFECTS ON POME AND STONE FRUIT TREES (NC-140)	X		X			X	
Czuprynski, C. J.	BOVINE RESPIRATORY DISEASE: RISK FACTORS, PATHOGENS, DIAGNOSIS AND MANAGEMENT (NC-107)	X		X				
Tracy, W. F.	PLANT GERMPLASM AND INFORMATION MANAGEMENT AND UTILIZATION (NC-7)	X		X				
Armentano, L. E.	METABOLIC RELATIONSHIPS IN SUPPLY OF NUTRIENTS FOR LACTATING COWS (NC-185)	X		X			X	
Duke, S. H.	REGULATION OF PHOTOSYNTHETIC PROCESSES (NC-142)	X		X			X	
Albrecht, K. A.	FORAGE PROTEIN CHARACTERIZATION AND UTILIZATION FOR CATTLE (NC-189)	X		X				
Stoltenberg, D. E.	BIOLOGICAL AND ECOLOGICAL BASIS FOR WEED MANAGEMENT DECISION SUPPORT SYSTEMS TO REDUCE HERBICIDE USE (NC-202)	X		X				
Wedberg, J. L.	ECOLOGY AND MANAGEMENT OF EUROPEAN CORN BORER AND OTHER STALK-BORING LEPIDOPTERA (NC-205)	X		X			X	
Dentine, M. R.	GENETIC IMPROVEMENT OF CATTLE USING MOLECULAR GENETIC INFORMATION (NC-209)	X		X				
Palta, J. P.	FREEZE DAMAGE AND PROTECTION OF FRUIT AND NUT CROPS (W-130)	X		X				
Maxwell, D. P.; Nienhuis, J.	GENETIC IMPROVEMENT OF BEANS (PHASEOLUS VULGARIS L.) FOR YIELD, DISEASE RESISTANCE AND FOOD VALUE (W-150)	X		X				
Bamberg, J. B.; Spooner, D. M.; Simon, P.	INTRODUCTION, PRESERVATION, CLASSIFICATION, DISTRIBUTION AND EVALUATION OF SOLANUM SPECIES (NRSP-6)	X		X				
Binning, L. K.	SHADING EFFECTS OF VEGETABLE CROPS ON COMMON ANNUAL WEEDS	X					X	
Darien, B. J.; Backstrom, L.	PRIMING AND CHANGE IN RESPIRATORY TRACT OF PIGS AFTER EXPOSURE TO DUST, ENDOTOXIN AND B-1,3-GLUCAN					X		

Principal Investigator	Title of Project	Hatch Total (Regular & Multistate)	Hatch Multistate	McIntire/Stennis	Animal Health	Extension Activity	Total Formula Funds	Total F.T.E
Lauer, J. G.	IMPROVEMENT OF SOYBEAN PRODUCTION EFFICIENCY IN A REDUCED-TILLAGE ENVIRONMENT	X					X	
Kirkpatrick, B. W.	BOVINE-HUMAN COMPARATIVE MAPPING THROUGH RADIATION HYBRID MAPPING	X						
Landick, R. C.	RECOGNITION OF PAUSE AND TERMINATION SIGNALS BY DIVERSE BACTERIAL RNA POLYMERASES	X						
Chambliss, G. H.	MICROBIAL DEGRADATION OF NITROGLYCERIN	X						
Nibert, M. L.	HOW DO MAMMALIAN REOVIRUSES SELECTIVELY PACKAGE AND REPLICATE THEIR 10 RNA GEONOME SEGMENTS.	X						
Hoffman, P. C.	THE EFFECT OF FORAGE SPECIES ON MILK PROTEIN PRODUCTION IN LACTATING DAIRY COWS	X					X	
Shaver, R. D.	INFLUENCE OF THE PHYSICAL FORM OF CORN SILAGE ON UTILIZATION BY LACTATING DAIRY COWS	X					X	
Connell, T. R.	DEVELOPMENT OF BIOLOGICALLY BASED SITE-SPECIFIC MANAGEMENT SYSTEMS FOR VEGETABLE CROP PRODUCTION	X					X	
Goldman, I. L.	ONION PHYTOPHARMACEUTICAL ACTIVITY: GENETIC CONTROL, AND TEMPORAL MORPHOLOGICAL DISTRIBUTION	X						
Handelsman, J.	RESISTANCE TO ZWITTERMICIN A	X						
Bockheim, J. G.	SOIL ACIDIFICATION, BASE-CATION CYCLING, AND SUSTAINABILITY OF NORTHERN MESIC FOREST ECOSYSTEMS	X						
Gower, S. T.; Mackay, D. S.	COUPLING FOREST ECOSYSTEM MODELS TO GROUNDWATER MODELS:GUIDE TO NATURAL RESOURCE MANAGEMENT IN WISCONSIN				X			
Young, D.	A COMPREHENSIVE STUDY OF THE SCARABAEOID BEETLES OF WISCONSIN (COLEOPTERA: SOARABAEOIDEA)	X						
Shook, G. E.; Weigel, K. A.	GENETIC ENHANCEMENT OF HEALTH AND SURVIVAL FOR DAIRY CATTLE (S-284)	X	X					
Lorimer, C.	MANAGEMENT OF EASTERN HEMLOCK FORESTS BY SINGLE TREE AND GROUP SELECTION METHODS				X			
Bockheim, J.; David, C.	TIMBER HARVEST IN A SOIL COMPACTION AND ASPEN GROWTH IN THE UPPER GREAT LAKES REGION				X			
Czuprynski, C. J.	INVESTIGATION OF GROWTH HORMONE AND PROLACTIN ON THE INTRACELLULAR MULTIPLICATION OF MYCOBACTERIUM					X		
Lauer, J.	IMPROVEMENT OF SILAGE YIELD AND QUALITY IN WISCONSIN CORN PRODUCTION SYSTEMS	X					X	

Principal Investigator	Title of Project	Hatch Total (Regular & Multistate)	Hatch Multistate	McIntire/Stennis	Animal Health	Extension Activity	Total Formula Funds	Total F.T.E
Gianola, D.	BAYESIAN ANALYSIS OF LONGITUDINAL MODELS FOR PRODUCTION, DISEASE AND PROLIFICACY DATA IN ANIMAL BREEDING	X						
Wentworth, B.	REPRODUCTIVE EFFICIENCY OF TURKEYS (S-285)	X	X				X	
Gourse, R.	PROMOTER IDENTIFICATION AND CHARACTERIZATION IN DIVERSE BACTERIA	X						
Reznikoff, W.	C-TERMINAL ANALYSIS OF TRANSPOSON TN5 TRANSPOSASE	X						
Amasino, R.	MODIFICATION OF FLOWERING TIME IN HIGHER PLANTS	X						
Sheffield, L.	CELL SIGNALING IN MAMMARY GLAND DEVELOPMENT	X						
Goodman, W. G.	MOLECULAR REGULATION OF HEMOLYMPH JUVENILE HORMONE BINDING PROTEIN EXPRESSION	X						
Kermicle, J.	GENE ACTION IMPRINTING IN CORN	X						
Stier, J.	MECHANISMS OF COLD TOLERANCE IN TURFGRASSES	X					X	
First, N. L.	CELLULAR & GENOMIC REPROGRAMMING OF VARIOUS CELL TYPES OF BOVINE BY DIFFERENT METHODS OF NUCLEAR TRANSFER	X						
Benevenga, N.	QUANTITATIVE ASPECTS OF LYSINE METABOLISM IN THE PIG	X						
Grau, C. R.	ENDOPHYTIC MICROORGANISMS AND LATENT PATHOGENS AS POSSIBLE AGENTS MODIFYING SOYBEAN HEALTH AND PRODUCTIVITY	X					X	
Doebly, J.	MOLECULAR-GENETICS OF PLANT ARCHITECTURE IN MAIZE	X						
Bohnhoff, D. R.	LOAD DISTRIBUTION IN METAL-CLAD WOOD-FRAME DIAPHRAGMS	X						
Shinners, K. J.	INTEGRATION OF HAY AND FORAGE EQUIPMENT INTO SITE SPECIFIC FARMING SYSTEMS	X						
Bavister, B. D.	MAINTENANCE OF MEIOTIC ARREST IN CATTLE OOCYTES BY PHYSIOLOGICAL MECHANISMS	X						
Splitter, G.	BRUCELLA GENES INDUCED OR SUPPRESSED WITH INTRACELLULAR INVASION	X						
Boerboom, C. M.	VARIABLES INFLUENCING WEED INTERFERENCE ON CORN AND SOYBEAN YIELD	X					X	
Stoltenberg, D. E.	ECOPHYSIOLOGICAL CHARACTERIZATION AND MODELLING OF WEED-CROP COMMUNITIES	X						
Tracy, W. F.	RUST RESISTANCE IN SWEET CORN: VEGETATIVE PHASE CHANGE AND SOURCES OF RESISTANCE (NE-124)	X	X					

Principal Investigator	Title of Project	Hatch Total (Regular & Multistate)	Hatch Multistate	McIntire/Stennis	Animal Health	Extension Activity	Total Formula Funds	Total F.T.E
Parrish, J.	EFFECT OF SCROTAL INSULATION ON THE ABILITY OF BOVINE SPERM TO PENETRATE AND ACTIVATE OCCYTES, AND SUPPORT EMBRYO DEVELOPMENT	X						
Thomas, D. L.	COMPARISON OF EAST FRIESIAN AND LACAUNE DAIRY SHEEP	X					X	
Downs, D. M.	THE ROLE OF YgfF IN THE METABOLISM OF SALMONELLA TYPHIMURIUM	X						
Clagett-Dame, M.	VITAMIN A AND SYMPATHETIC NEURONAL DEVELOPMENT	X						
Culbertson, M. R.	ROLE OF mRNA DECAY IN GENE EXPRESSION	X						
Laughon, A. S.	CIS-ELEMENT SELECTION: A TOOL FOR FUNCTIONAL GENOMICS	X						
Masson, P. H.	CHARACTERIZATION OF AN <i>ARABIDOPSIS THALIANA</i> GENE INVOLVED IN ROOT AND SHOOT MORPHOGENESIS	X						
Nienhuis, J.	CHARACTERIZATION AND UTILIZATION OF GENETIC RESOURCES IN PHASEOLUS VULGARIS	X						
Susman, M.R.	GENETIC MANIPULATION OF PLASMA MEMBRANE PROTEINS INVOLVED IN MINERAL TRANSPORT	X						
Lunn, D. P.	REGULATION OF EQUINE IMMUNE RESPONSES TO VIRAL RESPIRATORY INFECTION					X		
German, T. L.	EXPLOITING THE SPECIFICITY OF TOSPOVIRUS-THRIPS INTERACTIONS TO CONTROL VIRUS DISEASE AND INSECT DAMAGE	X						
MacGuidwin, A. E.	POPULATION ATTRITION OF THE SOYBEAN CYST NEMATODE IN THE ABSENCE OF A HOST (NG215)	X	X					
Nibert, M. L.	RECOATING REOVIRUS AND BLUETONGUE VIRUS PARTICLES W/BACULOVIRUS-EXPRESSED VIRAL PROTEINS					X		
Splitter, G.	BOVINE HERPESVIRUS-1 TEGUMENT PROTEINS					X		
Karasov, W. H.	HYDROPHILIC TOXIN ABSORPTION BY MAMMALS AND ITS MODULATION	X						
Thomas, C.; Houghton, J.	ASSESSING THE EDUCATIONAL NEEDS OF WOMEN WHO OWN NON-INDUSTRIAL PRIVATE FOREST LAND IN WISCONSIN				X			
Rogers, R.; David C.; Harms, J.	FEASIBILITY OF USING A NEW TYPE OF BIODEGRADABLE CONTAINER FOR FOREST SEEDLING PRODUCTION				X			
Combs, D.	ENVIRONMENTAL AND ECONOMIC IMPACTS OF NUTRIENT MANAGEMENT ON DAIRY FORAGE SYSTEMS (NE-132)	X	X					
Rutledge, J. J.	GERM CELL AND EMBRYO DEVELOPMENT AND MANIPULATION FOR THE IMPROVEMENT OF	X	X					

Principal Investigator	Title of Project	Hatch Total (Regular & Multistate)	Hatch Multistate	McIntire/Stennis	Animal Health	Extension Activity	Total Formula Funds	Total F.T.E
	LIVESTOCK (W-171)							
Ruegg, P. L.	BEHAVIORAL AND HEALTH EFFECTS OF TAIL DOCKING IN DAIRY COWS	X					X	
Silbernagel, J. M.	PLANT-POLLINATOR LANDSCAPES: BUMBLEBEE FORAGING PATTERNS WITHIN SPATIALLY-HETEROGENEOUS NATURAL BOGS AND CULTIVATED CRANBERRY BOGS	X						
Jung, G.	FINGERPRINTING OF CREEPING AND COLONIAL BENTGRASS CULTIVARS USING SCAR MARKERS	X					X	
Albrecht, K. Schaefer, D.	INTEGRATED CROP, SOIL, AND ANIMAL MANAGEMENT SYSTEMS FOR UPPER MIDWEST UNGLACIATED SOILS (NC-157)	X		X			X	
Powell, J.; Kelling, K.	MEASUREMENT OF PHOSPHORUS & NITROGEN AVAILABILITY FROM REPEATED MANURE APPLICATION	X					X	
Shook, G.E.; Collins, M. T.	GENETIC RESISTANCE TO PARATUBERCULOSIS IN DAIRY CATTLE	X						
Stanosz, G. R.; Kruger, E. L.	PLANT AND PATHOGEN INFLUENCES ON VARIATION IN SHADE TOLERANCE AMONG SPECIES IN NORTHERN HARDWOOD FORESTS				X			
Raffa, K. F.	INTERACTIONS AMONG BARK BEETLES, PATHOGENS, AND CONIFERS IN NORTH AMERICAN FORESTS (W187)	X		X				
Barnes, D. M.	DIETARY REGULATION OF THE MULTIDRUG RESISTANCE GENE PRODUCT, P-GLYCOPROTEIN	X						
Bent, A. F.	NEW METHODS FOR MOLECULAR GENETIC MANIPULATION OF SOYBEAN	X						
Patterson, S. E.	GENETIC AND MOLECULAR CHARACTERIZATION OF JL-2, A CELL SEP. MUTANT IN ARABIDOPSIS THALIANA REGULATING FLORAL ORGAN ABSCISSION & POD SHATTER	X						
Kaepler, H. F.	GENETIC ENGINEERING OF OAT WITH TRANSGENES ENCODING ANTIFUNGAL PROTEINS AND RESISTANCE PATHWAY REGULATORS FOR IMPROVED DISEASE RESISTANCE	X						
Kaepler, S. M.	GENETIC ANALYSIS OF PHOSOPHORUS NUTRITION AND MYCORRHIZAL INTERACTIONS IN MAIZE	X						
Coors, J. G.	CORN SILAGE: GERMPLASM AND TECHNOLOGY DEVELOPMENT	X						
Forest, K.	STRUCTURE-FUNCTION STUDY OF VIRULENCE FACTOR REGULATOR FROM PSEUDOMONAS AERUGINOSA	X						
Barclay, S. L.	GENES EXPRESSED DURING INFECTION BY CRYPTOSPORIDIUM	X						
Bednarek, S. Y.	CHARACTERIZATION OF ARABIDOPSIS DYNAMIN-	X						

Principal Investigator	Title of Project	Hatch Total (Regular & Multistate)	Hatch Multistate	McIntire/Stennis	Animal Health	Extension Activity	Total Formula Funds	Total F.T.E
------------------------	------------------	------------------------------------	------------------	------------------	---------------	--------------------	---------------------	-------------

	<b>LIKE PROTEINS</b>							
Fricke, P. M.	METHODS OF IMPROVING REPRODUCTION IN DAIRY HEIFERS	X					X	
Grummer, R. R.	ELIMINATION OF THE TRANSITION PERIOD TO ENHANCE DAIRY CATTLE HEALTH AND PRODUCTION	X						
Williamson, R. C.	EFFORTS OF CULTURAL MANIPULATIONS & HOST-PLANT SELECTION: ALTERNATIVE APPROACH FOR CONTROL OF BLACK CUTWORMS ON GOLF COURSE PUTTING GREENS	X					X	
Strand, M. R.	STRUCTURE-FUNCTION STUDIES ON PLASMATOCYTE SPREADING PEPTIDE	X						
Jiang, J.	MOLECULAR CYTOGENETICS ANALYSIS OF THE POTATO GENOME	X						
Jull, L. G.	EFFECT OF DEICING CHEMICALS ON WOODY ORNAMENTAL PLANTS	X					X	
Vierstra, R. D.	IDENTIFICATION OF FACTORS RESPONSIBLE FOR SELECTIVE PROTEIN DEGRADATION IN PLANTS	X						
Andrews, J. H.	THE COLONIZATION PATTERN OF APPLE LEAVES BY AUREOBASIDIUM PULLULANS	X						
Allen, C.	CHARACTERIZING BACTERIAL WILT VIRULENCE GENE EXPRESSION IN THE PLANT HOST	X						
McManus, P. S.	CHARACTERIZATION OF AGROBACTERIUM SPP. ISOLATED FROM CRANBERRY AND ETIOLOGY OF CRANBERRY AND ETIOLOGY OF CRANBERRY STEM GALL	X					X	
Albrecht, R. M.	COLLOIDAL METAL PARTICLES FOR HIGH RESOLUTION BIOLOGICAL LABELING	X						
Ginther, O. J.	FUNCTIONAL TWO-WAY COUPLING BETWEEN FSH AND FOLLICLES	X						
Goodwin, E. B.	ANALYSIS OF NUCLEAR EXPORT OF TRA-1 IN C. ELEGANS	X						
Lunn, D. P.	DEVELOPMENT OF ATTENUATED SALMONELLA AND MODIFIED VACCINIA ANKARA AS VECTORS FOR EQUINE INFLUENZA DNA VACCINATION					X		
Radeloff, V. C.	LANDSCAPE FRAGMENTATION DUE TO CHANGES IN ROAD DENSITY IN NORTHWESTERN WISCONSIN FROM 1938 TO 1992				X			
Rickenbach, M. G.	COOPERATION AMONG WOODLAND OWNERS: A CASE STUDY OF ORGANIZATIONAL FORMS AND PARTICIPANT MOTIVATIONS				X			
Wattiaux, M. A.	IMPACT OF DAIRY DIET FORMULATION ON LACTATION, NITROGEN UTILIZATION, NUTRIENT EXCRETION AND POTENTIAL AMMONIA LOSS TO THE ENVIRONMENT	X						



Investigator	Title of Project	Hatch Total (Regular & Multistate)	Hatch Multistate	McIntire/ Stennis	Animal Health	Extension Activity	Total Formula Funds	Total F.T.E
--------------	------------------	--	---------------------	----------------------	------------------	-----------------------	---------------------------	----------------

<b>Wisconsin Project No.</b>	<b>Principal Investigator</b>	<b>Title of Project</b>	<b>Hatch Total (Regular &amp; Multistate)</b>	<b>Hatch Multistate</b>	<b>McIntire/ Stennis</b>	<b>Animal Health</b>	<b>E A</b>
----------------------------------	-----------------------------------	-------------------------	---	-----------------------------	------------------------------	--------------------------	----------------

Wisconsin Project No.	Principal Investigator	Title of Project	Hatch Total (Regular & Multistate)	Hatch Multistate	McIntire/Stennis	Animal Health	F
-----------------------	------------------------	------------------	------------------------------------	------------------	------------------	---------------	---

## ***Impact Statements and Selected Results***

Publications in refereed journals, books and extension bulletins have been reported on projects using the AD-421 annual reports in the CRIS system. A number of projects are reported as impacts on agriculture or natural resources. Some of the projects had funding from Hatch, McIntire-Stennis and Animal Health; others were funded from competitive federal programs and industry gifts and grants. Outputs described in the original Plan of Work are illustrated by example from the past year in the following projects.

### **Bacteria may help reduce fertilizer needs and still improve corn yields**

***Key themes: Plant production efficiency, plant health, biological control, nutrient management***

***Focus area: Sustainability of agriculture and forestry***

The issue: Nitrogen fertilizer for corn is a major input cost for farmers and a potential problem with water quality. Soil microorganisms can provide nitrogen for legumes but have rarely been studied or utilized for non-legumes. If strains of bacteria could be developed for corn, nitrogen fixation by the bacteria could lessen or eliminate the need for nitrogen fertilizers with accompanying benefits on surface and ground water quality.

What's been done: Two UW-Madison agronomists have investigated naturally occurring strains of bacteria that showed promise of providing nitrogen to crops. Results identified some strains as likely prospects for improving corn. Promising strains were field tested in five states as an inoculum to corn seed during 2000. Inoculation increased yields an average of 5 to 10 percent.

The impact: A patent application has been filed by the Wisconsin Alumni Research Foundation, "Enhanced maize yield by inoculation with *Klebsiella* sp. ZMVSY, *Herbaspirillum seropedicae* Z152, and *Gluconacebacter diazotrophicus* PA15". Agrobiotics, a family-owned company that manufactures similar products for legumes has negotiated a licensing agreement for the technology. Seed with the inoculum should be available to producers in the next few years.

Funding — Department of Energy grant funds, funds from Cargill; USDA Hatch project WIS05219, "Enhancing mineral nutrient availability in maize: microbial associations and genetic optimized uptake", an interdisciplinary project that ended 9/30/99; as well as State of Wisconsin.

### **Waste fish can help landfills and babies**

***Key themes: Niche market, biobased products, recycling***

***Focus areas: Biobased products program***

Issue: Each year the petroleum industry makes 800,000 tons of hydrogels -- the material that captures and holds moisture in diapers and scores of commercial products. But those hydrogels use up valuable oil and degrade slowly in landfills. Millions of tons of fish go to waste every year in commercial fishing and lake rehabilitation programs that result in harvest of undesirable species such as carp. These fish often pose another disposal headache.

What's been done: A UW-Madison food scientist has developed a biochemical process that turns dried and chemically stabilized fish proteins into the first biodegradable hydrogels for diapers and other products. The fish-based hydrogels decompose in the landfill within a month. The hydrogels can absorb up to 400 times their weight in water.

Impact: On one large lake in Wisconsin, the harvest of carp is over 2 million pounds annually. The new process could make "waste" fish more valuable, while reducing demand for petroleum and landfill space. This process also can be adapted for using other under-utilized plant proteins, such as soy protein, as feed stocks. Preliminary research indicates that the protein-based hydrogels could also temporarily trap herbicides and other pesticides, slowing their release in soil. The material may work in other hydrogel uses such as hand lotion and filters.

A WARF patent has been issued, #US6310105, "Carboxyl-modified super-absorbent protein hydrogel". High industry interest has prompted over 25 companies to contact WARF about licensing. A commercial start-up company has worked towards setting up a pilot manufacturing facility. NuTerra Chemical is a Colorado-based company that concentrates on environmentally friendly products. NuTerra has been improving the cost efficiency and absorption efficiency of the product and expects to have samples available to manufacturers in fall 2002.

Funding – The UW-Madison Graduate School, USDA –NRICGP, NOAA Sea Grant Institute and State of Wisconsin.

### **Poultry stem cells**

***Key themes: Animal genomics, Adding value to agricultural products, biotechnology***

***Focus areas: Advances in biotechnology to develop new agricultural products***

The issue: Embryonic stem cells have become increasingly important in biology and health. Mouse stem cells have helped scientists understand the early development of mammals, but scientists who work with birds have not had these tools to work with.

What's been done: Scientists at CALS (UW- Madison) have coaxed into existence a new line of cells from fertilized chicken eggs. Called blastodermal cells, the cell line is the avian counterpart of stem cells. The cells appear immortal in culture and remain in an undifferentiated state. Researchers have been able to make cells from this new line differentiate into representatives of the four main tissues of birds: muscle, nerve, connective, and epithelial. Similar methods should work for other avian species.

Impact: The technology could be used to develop new reproductive methods for domestic fowl as well as endangered species. The cell lines can be frozen and remain viable (in contrast to problems in freezing avian semen). Preserving the cells of endangered species could increase the populations of California condors, whooping cranes and other endangered birds. The cells could

also lead to methods for producing valuable proteins from transgenic birds or producing pharmaceuticals in the germ-free environment of eggs.

Funding – Wisconsin Hatch project #WIS04181, “Reproductive efficiency of turkeys”, a contribution to the multistate project, S-285.

### **New cranberry to brighten future for growers**

***Key themes: Adding value to agricultural products, Plant germplasm, Agricultural competitiveness***

***Focus areas: Sustainability of agriculture and forestry***

The issue: Wisconsin leads the nation in cranberry production and the state produces more than 3 million barrels and around 50 percent of the national crop. Northern Wisconsin has short growing seasons that can delay ripening and especially color production of the crop. Processors pay a premium price for deep red berries. Wisconsin growers are at a disadvantage with growers with a longer season. Coloration of cranberry has a health consequence since the pigments act as antioxidants and may reduce the risk of heart attack, stroke and cancer.

What’s been done: In response to grower requests for an early coloring but high producing variety, horticultural scientists at UW-Madison started a development program for improved strains. Ten years of work has resulted in a high yielding strain that outperforms the current industry standard in early maturing and coloration. Field tests in northern and central Wisconsin showed that the new variety consistently outperformed its competitors.

The impact: A commercial variety, HyRed, has been patented by the Wisconsin Alumni Research Foundation. ‘HyRed’ has a high propensity to produce flower buds and may produce consistently high yields. The yields of other selections often decrease following a year with high yields. Grower trials are proceeding to further test the variety under commercial conditions. Results indicate that harvest can be done 2 to 3 weeks earlier with better color development.

Funding - Gottschalk Family Endowment, Wisconsin Cranberry Board, Ocean Spray, Inc., and State of Wisconsin.

### **Industrial hemp won’t replace traditional crops**

***Key issues: Agricultural competitiveness, niche market, risk management***

***Focus areas: Biobased products program***

The issue: Interest in industrial hemp as an alternative crop has been discussed in Wisconsin and some prominent officials have been debating the economic potential if the crop were legalized. Farmers are always interested in crops with good cash returns that might not need high inputs of fertilizer or chemicals.

What’s been done: Agricultural economists from CALS have reviewed more than 75 studies on industrial hemp production to look at the market potential if the crop were to become legal. Results were not very encouraging including a steep decline in worldwide production, a number

of competing crops with similar uses (such as flax and jute) complicated harvest and processing needs and a limited demand. Researchers concluded that fewer than 100 farms could supply the current North American market. With widespread interest and this small market, prices could be driven down or swing widely.

The impact: CALS economists presented the results of the study to the Wisconsin Assembly Agriculture Committee on Oct. 3, 2001. The study also identified research needs if the crop were to be legalized. This report has sparked intense discussions on the part of proponents and potential producers. Risk management will clearly be an important key to future production in Wisconsin.

Funding – State of Wisconsin and Integrated Research/Extension Hatch project #WIS04423, “Development of basis forecasting tools for Wisconsin agricultural markets”

### **Fruit protection after harvest**

*Key themes: Adding value to new and old agricultural products, food quality*

*Focus areas: Food quality and protection act implementation*

The issue: Increasing fruit and vegetable consumption is a goal for improved human health, but many limit their purchase of fresh foods due to spoilage concerns. Some artificial chemicals can preserve fruits and vegetables but many consumers prefer natural products. Producers and retailers could make more money on fresh foods if spoilage was less of a concern.

What’s been done: Scientists at UW-Madison have discovered a natural lipid found in plant and animal cells that can be sprayed on fruit before harvest. Plants sprayed with lysophosphatidylethanolamine, LPE, ripen their fruits more quickly (important in short-season Wisconsin) and fruits remain crisp longer in storage. Subsequently, the team has applied LPE to vegetables and cut flowers with similar positive results.

The impact: The technology for use of LPE in fruits and vegetables has been patented by the Wisconsin Alumni Research Foundation, #US5110341 and #US5126155. A new Wisconsin start-up company “Nutra-Park Inc.” has licensed the technology and has applied to the EPA for full approval after extensive field tests on cranberries under experimental use permits. Trials are also underway in Florida and California for tomatoes, grapes, strawberries, apples, citrus, cherries, and peaches.

Funding – Soybean Marketing Board; Wisconsin Cranberry Board; Wisconsin Potato Industry Board, Leach Farms, Inc.; and Wisconsin Hatch project #WIS03717, “Freeze damage and protection of horticultural species” (also multistate project W-130).

### **New pastures for graziers**

*Key issues: Grazing, diversified/alternative agriculture, plant germplasm*

*Focus areas: Small farms and their contributions to local economies*

The issue: Wisconsin producers put more cattle on pastures each year. They establish pastures by seeding a mix of grasses and a legume -- typically either alfalfa, red clover, or birdsfoot trefoil. But those legumes generally succumb to winter-kill or disease after two to five years and need to be re-established. Producers need pastures that will produce good forage and hold up better over the years.

What's been done: Preliminary research indicated that kura clover is a high-yielding, high-quality, persistent legume that might be an ideal pasture crop. Researchers evaluated the growth of Holstein steers that grazed either on red clover-grass or kura clover-grass pastures in southwestern Wisconsin. Both steers and kura clover pastures fared extremely well, even when grazing began in April and continued until September or October. Over a three-year period, steers on the kura clover-grass pastures gained an average of 2.65 pounds per day (916 pounds/acre/year) compared with 2.26 pounds per day (712 pounds/acre/year) for steers on red clover/grass pastures. The growth on kura clover-grass pastures also far surpassed previously reported growth on alfalfa-grass pastures at the same location. A second study found that forage yields from kura clover-grass mixtures remained stable over 10 years. Kura clover's extensive system of underground stems allows it to survive Wisconsin's harshest winters.

The impact: Assuming a selling price of 70 cents per pound for Holstein steers, the kura clover-grass pasture in this study would produce a return of approximately \$140 more per acre per year than the red clover-grass pastures.

Funding – Wisconsin Hatch project #WIS03270, “Forage protein characterization and utilization for cattle” (part of multistate project NC-189); Babcock Institute for International Dairy Research and Development; Center for Integrated Agricultural Systems (State of Wisconsin); and NorFarm Seeds.

## **Goal 2. A safe and secure food and fiber system.**

### ***Executive summary***

Under this goal, there were 7 projects including 3 that were multistate, interdisciplinary projects, and one which is an integrated research/extension project. Wisconsin is committed to continually changing its portfolio of research. The campus recently hired a cluster of three new faculty in food safety.

Wisconsin has a strong livestock economy with the majority of milk producers selling milk for cheese manufacture and export from Wisconsin. A number of specialty cheese plants, small meat processors, and fresh market vegetable and fruit producers must address food safety concerns. New projects have been established in marketing of quality cereals and oilseeds (WIS04227, multistate project NC-213) as well as a project on understanding the production of toxins due to fungal contamination in food (WIS04490).

### ***Updated project list for FY01***

New projects are printed in **bold**. Note that recent reclassification of projects has moved some projects into goals different from those previously listed in the Plan of Work. Some projects address several goals but are listed in only one.

Principal Investigator	Title of Project	Hatch Total (Regular & Multistate)	Hatch Multistate	McIntire/Stennis	Animal Health	Extension Activity	Total Formula Funds
<b>Goal 2: Enhance and Secure Food and Fiber System</b>							
<b>Objective 2.1: To improve access to an affordable, healthful, and culturally relevant food supply</b>							
Gould, B. W.	FOOD DEMAND, NUTRITION AND CONSUMER BEHAVIOR (S-278)	X	X				
Cox, T.	ANALYSIS OF THE INTERREGIONAL IMPACTS OF CHANGES IN U.S. AND WORLD DAIRY POLICY ON THE WISCONSIN AND U.S. DAIRY SECTORS	X					
Gunasekaran, S.	MARKETING AND DELIVERY OF QUALITY CEREALS AND OILSEEDS (NC-213)	X	X				
Walters, B. S.	THE POULTRY FOOD SYSTEM: A FARM TO TABLE MODEL (S-292)	X	X				
Jesse, E. V.	SUPPORTING THE UNDERSTANDING AND USE OF DAIRY PRICE RISK MANAGEMENT TOOLS	X				X	
	Total:	\$65,899	\$13,824	\$0	\$0	\$23,571	\$65,899
<b>Objective 2.2: To improve food safety by controlling or eliminating foodborne risks</b>							
Wong, A.	GENOTYPIC DIVERSITY IN HEMOLYSIN BL, A DIARRHEAL ENTEROTOXIN FROM BACILLUS CEREUS	X					
Yu, J.	GENETICS OF FUNGAL GROWTH, SPORULATION, AND MYCOTOXIN PRODUCTION	X					
	Total:	\$72,353	\$0	\$0	\$0	\$0	\$72,353
	<b>Total Goal 2:</b>	<b>\$138,252</b>	<b>\$13,824</b>	<b>\$0</b>	<b>\$0</b>	<b>\$23,571</b>	<b>\$138,252</b>

<b>Wisconsin Project No.</b>	<b>Principal Investigator</b>	<b>Title of Project</b>	<b>Hatch Total (Regular &amp; Multistate)</b>	<b>Hatch Multistate</b>	<b>McIntire/ Stennis</b>	<b>Ani Hea</b>
----------------------------------	-----------------------------------	-------------------------	---	-----------------------------	------------------------------	--------------------

Wisconsin Project No.	Principal Investigator	Title of Project	Hatch Total (Regular & Multistate)	Hatch Multistate	McIntire/Stennis	Animal Health
-----------------------	------------------------	------------------	------------------------------------	------------------	------------------	---------------

## ***Impact Statements and Selected Results***

Publications in refereed journals, books and extension bulletins have been reported on projects using the AD-421 annual reports in the CRIS system. A number of projects have impacts on food processors and consumers. Some of the projects had funding from Hatch, McIntire-Stennis and Animal Health; others were funded from competitive federal programs and industry gifts and grants. Outputs described in the original Plan of Work are illustrated by example from the past year in the following projects.

### **Natural plant compounds make germ-killers more effective.**

***Key themes: Food safety, new uses for agricultural products***

***Focus areas: biobased products program***

The issue: Antibacterial agents that target harmful microbes are found in everything from toothpastes, soaps and cosmetics, to sponges, cutting boards, and baby toys. But as the use of antibacterial agents in everyday items has soared, so have fears about the widespread emergence of resistant bacteria. New methods to kill germs safely but slow development of resistance are needed.

What's been done: UW-Madison scientists have discovered a promising way to keep microbes vulnerable to germ-killers. The method uses natural compounds called sesquiterpenoids. These compounds contribute to the aromas and flavors of herbs, spices, and flowers, and are widely used in perfumes and as flavorants. Sesquiterpenoids are safe and many are approved for use in foods and cosmetics. The researchers studied nerolidol, a sesquiterpenoid in green tea. They found that when teamed with small amounts of nerolidol, several antibiotics and other antibacterial agents became much better at killing bacteria, including some strains that cause illnesses. Other related terpenoids also promoted the activity of antibiotics and natural antimicrobials.

The impact: The discovery could pave the way for new antibacterial formulations that would be effective at much lower doses in consumer products. Sesquiterpenoids could also extend the life and effectiveness of antibiotics and antiseptics by delaying the appearance of microbes that resist those germ killers. A patent has been filed with the Wisconsin Alumni Research Foundation, #US6319958, "Method of sensitizing microbial cells to antimicrobial compound".

Funding – USDA-NRI grants 94-37201-1026 and 96-35201-272 and the State of Wisconsin.

## **Protecting food handling equipment from dangerous bacteria**

***Key themes: Food handling, food safety, foodborne pathogen protection***

***Focus areas: Food quality and protection act implementation***

The issue: Many of the worst disease-causing pathogens in food, such as Salmonella, E. coli O157:H7, and Listeria monocytogenes, are capable of thriving in the nooks and crannies of food-industry materials. These may even escape thorough cleaning and survive to contaminate food.

What's been done: A microbiologist and a cold plasma engineer have developed techniques to modify the surface of materials to make them more safe for food handling. One technique incorporates antimicrobial agents in an extremely thin surface layer. A second technique protects surfaces by fusing a film to them that bacteria cannot stick to nor form colonies. The food industry could apply these techniques to protect processing machines and perhaps even packaging.

The impact: A patent on this process has been issued to WARF, #US6096564, "Plasma-aided treatment of surfaces against bacterial attachment and biofilm deposition". This technique might be extended to medical devices such as catheters and implants.

Funding – Wisconsin Hatch project #WIS04507, "Generation of antifouling layers from high molecular weight liquid phase compounds under cold plasma conditions" (starting 10/1/01); USDA-Integrated Food Safety Initiative award 00-51110-9735; and NSF 87-21545.

### **Goal 3. A healthy, well-nourished population.**

#### *Executive summary*

Under this goal, there were 13 projects including 2 that were multistate interdisciplinary projects, and 2 that were integrated research/extension projects. Some projects listed under Goals 1 and 2 also have relevance for Goal 3. For instance, project #WIS04036, "Onion phytopharmaceutical activity: genetic control, and temporal morphological distribution", examines the health benefits of compounds from onions. Producers have been very enthusiastic about research that quantifies the health aspects of foods and identifies strains with particularly beneficial effects. New varieties of onions, beets, and carrots have been released by the Wisconsin experiment station for use by producers in 2001.

Wisconsin is committed to continually changing its portfolio of research. One new project (WIS04440) looks at the regulation of iron metabolism, which is a very common nutritional deficiency, particularly among women. Another new project (WIS04433) looks at the mechanisms of communication for yellowjackets, a common pest in Wisconsin. Results from this project may lead to management guidelines for avoiding problems with outdoor food sales, an important aspect of tourism in Wisconsin.

#### *Updated project list for FY01*

New projects are printed in **bold**. Note that recent reclassification of projects has moved some projects into goals different from those previously listed in the Plan of Work. Some projects address several goals but are listed in only one

Principal Investigator	Title of Project	Hatch Total (Regular & Multistate)	Hatch Multistate	McIntire/Stennis	Animal Health	Extension Activity	Total Formula Funds
<b>Healthy, Well Nourished Population</b>							
<b>Objective 3.1: To optimize the health of consumer by improving the quality of diets, the quality of food, and the number of food choices</b>							
Elson, C. E.	ROLE OF N-3/N-6 POLYUNSATURATED FATTY ACIDS IN HEALTH MAINTENANCE (NC-167)	X	X				
Nitzke, S. A.	USING STAGES OF CHANGE MODEL TO PROMOTE CONSUMPTION OF GRAINS, VEGETABLES AND FRUITS BY YOUNG ADULTS (NC-219)	X	X			X	
Ney, D.	ANABOLIC EFFECTS OF INSULIN-LIKE GROWTH FACTOR-I AND GROWTH HORMONE DURING PARENTERAL NUTRITION	X					
Schoeller, D.	EFFECTS OF EXERCISE ON THE UTILIZATION OF DIETARY FAT	X					
Attie, A. D.	BIOCHEMISTRY AND GENETICS OF INSULIN RESISTANCE AND DIABETES	X					
Ntambi, J. M.	CONJUGATED LINOLEIC ACID (cla) IN FAT CELL DIFFERENTIATION AND METABOLISM	X					
Smith, S. M.	FUNCTIONS OF VITAMIN A IN CARDIAC DEVELOPMENT AND FUNCTION	X					
Tanumihardjo, S. A.	DEVELOPMENT OF THE 13C2-RETINOL ISOTOPE DILUTION ASSAY IN THE HUMAN AND ITS APPLICATION TO DIETARY B-CAROTENE MODIFICATION	X				X	
Eisenstein, R. S	IRON REGULATION OF TRANSFERRIN SYNTHESIS & SECRETION	X					
Groblewski, G. E	CALCIUM/CALMODULIN DEPENDENT PROTEIN KINASE II AND DIGESTIVE EXOCRINE SECRETION	X					
Total:		\$324,430	\$24,554	\$0	\$0	\$49,988	\$324,430

Principal Investigator	Title of Project	Hatch Total (Regular & Multistate)	Hatch Multistate	McIntire/Stennis	Animal Health	Extension Activity	Total Formula Funds
<b>Objective 3.2: To promote health, safety, and access to quality health care</b>							
Trumbo, C.	CLAIMS-MAKING AND POPULAR EPIDEMIOLOGY IN THE EXPRESSION OF COMMUNITY CONCERN OVER CANCER	X					
Jeanne, R. L.	MECHANISMS OF COMMUNICATION YELLOWJACKET WASPS	X					
Lan, Q.	ISOLATION OF CUTICLE PROTEIN GENES FROM MOSQUITO, AEDES AEGYPTI	X					
	Total:	\$46,557	\$0	\$0	\$0	\$0	\$46,557
	<b>Total Goal 3:</b>	\$370,987	\$24,554	\$0	\$0	\$49,988	\$370,987

<b>Wisconsin Project No.</b>	<b>Principal Investigator</b>	<b>Title of Project</b>	<b>Hatch Total (Regular &amp; Multistate)</b>	<b>Hatch Multistate</b>	<b>McIntire/ Stennis</b>	<b>Ani Hea</b>
----------------------------------	-----------------------------------	-------------------------	---	-----------------------------	------------------------------	--------------------

Wisconsin Project No.	Principal Investigator	Title of Project	Hatch Total (Regular & Multistate)	Hatch Multistate	McIntire/Stennis	Animal Health
-----------------------	------------------------	------------------	------------------------------------	------------------	------------------	---------------

## ***Impact Statements and Selected Results***

Publications in refereed journals, books, and extension bulletins have been reported on projects using the AD-421 annual reports in the CRIS system. A number of projects listed under other goals have impacts on human health and nutrition. Some of the projects had funding from Hatch, McIntire-Stennis, and Animal Health; others were funded from competitive federal programs and industry gifts and grants. Outputs described in the original Plan of Work are illustrated by example from the past year in the following projects.

### **Rural access to health care**

***Key issues: Health care, impact of change on rural communities, workforce safety***

***Management goals: Multicultural and diversity issues***

***Focus areas: Small farms and their contributions to local economies***

The issue: Farm families and migrant workers are likely to be at a disadvantage in obtaining health insurance at a reasonable cost with adequate coverage. Both farm families and migrant workers contribute to rural economies and are an important part of economic development.

What's been done: A random sample of 250 farm households from the Wisconsin Farm Service Agency were sampled as well as a telephone survey of 629 Wisconsin farm households were analyzed for access to health insurance and off-farm employment. On Wisconsin dairy farms, when one spouse was working off farm, the wife was 4 times as likely to be the off-farm worker as the husband. Over 50 % of the farms had one, but not both, spouses in off-farm employment. Thus the "farm wife" was the major source of health care that came from off-farm employment. Health insurance coverage was cited as one of the reasons to seek off-farm employment.

Bilingual interviews were done with 161 migrant workers in 17 Wisconsin counties and 120 employers of migrant workers were surveyed on their attitudes toward the Migrant Labor Law, health insurance provisions, effect on businesses of availability of migrant workers and economic effects of migrant workers on local economies.

The impact: The Governor's Council on Migrant Labor has received a briefing on the survey results of the migrant study. Additional funding has been provided by the Wisconsin Department of Workforce Development, United Migrant Opportunity Services, Inc., and the Midwest Food Processors Assn. A report on the status of small farms, "A portrait of family farmers in Wisconsin" has been published by the Center for Demography and Ecology, UW-Madison.

Funding: Hatch project #WIS04044, “The impact of health insurance on health status and medical utilization among Wisconsin farmers” and state project # WIS04587, “Economic impact of migrant farmworkers in Wisconsin”.

## **Goal 4. Greater harmony between agriculture and the environment.**

### *Executive summary*

Under this goal, there were 38 projects including 9 that were multistate interdisciplinary projects, 7 were McIntire-Stennis projects, and 13 were integrated research/extension projects. Projects listed under Goal 1 have many aspects that address the interactions of agricultural production and protection of natural resources.

Wisconsin is committed to continually changing its portfolio of research. Eleven new projects have been added including many that address crucial aspects of water quality. Dairy producers have indicated that manure and nutrient management is one of their highest priorities. New projects address this need with soil modeling approaches (WIS04451, at the microscopic level, and WIS04453 at the watershed level), manure treatment options (WIS04492), and management practices (WIS04485, multistate NC-230). Organic producers have been interested in the effects of different management strategies on soil microbial populations. This topic is addressed in the new project WIS04466. In summer of 2000, a new soybean aphid was detected in southern Wisconsin. Concerns from producers prompted the formation of multistate project WIS04492 as part of NC-502, a rapid response multistate research and extension activity.

### *Updated project list for FY01*

New projects are printed in **bold**. Note that recent reclassification of projects has moved some projects into goals different from those previously listed in the Plan of Work. Some projects address several goals but are listed in only one.

Principal Investigator	Title of Project	Hatch Total (Regular & Multistate)	Hatch Multistate	McIntire/Stennis	Animal Health	Extension Activity	Total Formula Funds
<b>Water Harmony Between Agriculture and the Environment</b>							
<b>Objective 4.1: To develop, transfer, and promote the adoption of efficient and sustainable agricultural, forestry, and other resource conservation policies, programs technologies, and practices that ensure ecosystems integrity and biodiversity</b>							
Lowery, B.	IMPACT OF ACCELERATED EROSION ON SOIL PROPERTIES AND PRODUCTIVITY (NC-174)	X	X			X	
Bundy, L. G.	CHARACTERIZING NITROGEN MINERALIZATION AND AVAILABILITY IN CROP SYSTEMS TO PROTECT WATER RESOURCES (NC-218)	X	X			X	
Barak, P. W.	MICROSCALE ANALYSIS AND MODELING OF AGRICULTURAL LIMING	X					
Field, D. R.	LANDOWNERS AND LANDUSE PRACTICES ADJACENT TO THE KICKAPOO RESERVE.			X			
Guries, R.	FOREST TENURE DYNAMICS AT THE PUBLIC/PRIVATE LANDS INTERFACE			X			
Deller, S. C.	MODELING THE STRUCTURAL CHANGES OF WISCONSIN'S RURAL ECONOMY	X				X	
Triplett, E.W.	ANALYSIS OF A TRIFOLIUM TOXIN RESISTANCE MECHANISM CONFERRED BY RHIZOBIUM	X					
Cooperband, L.; Stone, A.; Stevenson, W. R.; MacGuidwin, A.E.; Staub, J.; Harrison, H.	VEGETABLE PRODUCTION WITH RAW OR COMPOSTED PAPER MILL SLUDGE: EFFECTS ON SOIL QUALITY IN WISCONSIN'S CENTRAL SANDS	X				X	
Helmke, P. A.	MINERALIZATION OF SOIL ORGANIC PHOSPHORUS BY PHOSPHATASE AND PHYTASE AND ITS RELATION TO PLANT NUTRITION	X					
Nordheim, E. V.	THE DEVELOPMENT OF STATISTICAL METHODS FOR COMPARING SPECIES ABUNDANCE CURVES AND ASSESSING SPECIES RELATIONSHIPS	X					

Principal Investigator	Title of Project	Hatch Total (Regular & Multistate)	Hatch Multistate	McIntire/Stennis	Animal Health	Extension Activity	Total Formula Funds
	Total:	\$226,942	\$62,199	\$51,031	\$0	\$126,826	\$277,973
<b>Objective 4.2: To develop, transfer, and promote adoption of efficient and sustainable agricultural, forestry, and other resource policies, programs, technologies, and practices that protect, sustain, and enhance water, soil, and air resources</b>							
Goodman, R. M.	BIOCONTROL OF SOIL-BORNE PLANT PATHOGENS (NC-125)	X	X				
Wedberg, J. L.	A NATIONAL AGRICULTURAL PROGRAM TO CLEAR PEST CONTROL AGENTS FOR MINOR USES (NRSP04)	X	X			X	
Raffa, K. F.	EFFECTS OF PLANT DEFENSE CHEMISTRY ON BIOLOGICAL CONTROL OF CHEMICALLY DEFENDED/UNDEFENDED PESTS			X			
McCown, B.	DEFINITION AND APPLICATION OF PEST RESISTANCE MECHANISMS IN THE TREE GENUS BETULA			X			
Cooperband, L.	EFFECTS OF COMPOST ON SOIL CHEMICAL/PHYSICAL/BIOLOGICAL PROPERTIES IN FIELD NURSERY CROP PRODUCTION	X				X	
Hogg, D. B; Grau, C. R.; Undersander, D. J.; Doll, J. D.; Wedberg, J. L.	DEVELOPMENT OF PEST MANAGEMENT STRATEGIES FOR FORAGE ALFALFA PERSISTENCE (NC-226)	X	X			X	
Wyman, J. A.	BIOLOGICAL REGULATION OF APHID POPULATIONS IN WISCONSIN POTATOES	X				X	
Goodman, R. M.	ANALYSIS OF MICROBIOTA ASSOCIATED WITH PLANT ROOTS IN COMPOST-AMENDED FARM SOIL	X					
Shepard, R. L.; Madison, F.	AN EVALUATION OF NUTRIENT MANAGEMENT PLANNING IN WISCONSIN	X				X	
Bland, W. L.; Barham, B. L.	INTEGRATED ASSESSMENT MODELING OF THE CENTRAL SANDS IRRIGATED VEGETABLE AGRICULTURAL SYSTEM	X				X	

Principal Investigator	Title of Project	Hatch Total (Regular & Multistate)	Hatch Multistate	McIntire/Stennis	Animal Health	Extension Activity	Total Formula Funds
Goodrich-Blair, H.	GENETIC AND BIOCHEMICAL CHARACTERIZATION OF AN ANT-DETERRENT PRODUCED BY X. NEMATOPHILUS	X					
Kung, K. S.	QUANTIFYING THE SOIL PORE SPECTRUM TO MINIMIZE CHEMICAL LEACHING THROUGH FIELD-SCALE PREFERENTIAL FLOWS PATHS	X					
Mackay, D. S.	DISTRIBUTED PARAMETER NONPOINT SOURCE POLLUTION MODELING IN NESTED WATERSHEDS	X					
Lindroth, R. L.	EFFECTS OF AIR POLLUTANTS ON TROPHIC INTERACTIONS			X			
Bozek, M.	EVALUATING STRUCTURAL LINKAGES BETWEEN RIPARIAN AREAS AND LITTORAL ZONES: DEVELOPMENT OF DENDROCHRONOLOGICAL RIPARIAN LAND USE MODEL			X			
Hogg, D. B.; Wedberg, J. L.; Grau, C. R.; German, T. L.; Wyman, J. A.; Boerboom, C. M.	NC-502 SOYBEAN APHID: A NEW PEST OF SOYBEAN PRODUCTION (NC-502)	X	X			X	
Karthikeyan, K. G.	ORGANIC SOLIDS AND PHOSPHORUS REMOVAL FROM ANIMAL MANURE USING CHEMICAL TREATMENT	X					
	Total:	\$284,756	\$54,597	\$85,186	\$0	\$161,574	\$369,942
<b>Objective 4.3: To improve decision-making on public policies related to agriculture and the environment</b>							
Converse, J. C.; Powell, J. M.; Holmes, B. J.	ANIMAL MANURE AND WASTE UTILIZATION, TREATMENT, AND NUISANCE AVOIDANCE FOR A SUSTAINABLE AGRICULTURE	X				X	
Bleam, W. F.	OXIDATION AND REDUCTION PROCESSES IN SOILS AFFECTING THE SOLUBILITY OF CHROMIUM AND MERCURY.	X					

Principal Investigator	Title of Project	Hatch Total (Regular & Multistate)	Hatch Multistate	McIntire/Stennis	Animal Health	Extension Activity	Total Formula Funds
Kruger, E. L.	USE OF TREMBLING ASPEN AS A BIOINDICATOR OF OZONES POTENTIAL TO INJURE WISCONSIN FORESTS	X					
Kloppenborg, J. R.; Stevenson, G. W.	COMMODITIES, CONSUMERS, AND COMMUNITIES: LOCAL FOOD SYSTEMS IN A GLOBALIZING ENVIRONMENT (NE-185)	X	X				
O'Keefe, G. J.	ENVIRONMENTAL INFORMATION SOURCES PREFERENCES OF AGRICULTURAL PRODUCERS	X					
Stier, J.	THE ROLE OF FORESTLAND TAX PROGRAMS IN PROMOTING ECOSYSTEM MANAGEMENT			X			
Bishop, R.	INVESTIGATION OF THEORETICAL FOUNDATIONS OF COST SHARING: APPLICATION TO WISCONSIN WATERSHED PROGRAM	X					
Field, D. R.	CREATING A SOCIAL-DEMOGRAPHIC LAYER FOR LANDSCAPE SCALE ANALYSIS IN UPPER MISSISSIPPI RIVER FLYWAY	X					
Hickey, W. J.	MICROBIOLOGICAL AND BIO-PHYSICAL FACTORS CONTROLLING BIOAVAILABILITY AND BIODEGRADATION OF POLYNUCLEAR AROMATIC HYDROCARBONS (PAHS)	X					
Hickey, W. J.	SOIL MICROBIAL TAXONOMIC AND FUNCTIONAL DIVERSITY AS AFFECTED BY LAND USE AND MANAGEMENT (S-297)	X	X				
Wolkowski, R. P.	INTEGRATING BIOPHYSICAL FUNCTIONS OF RIPARIAN SYSTEMS WITH MANAGEMENT PRACTICES AND POLICIES (NC-230)	X	X			X	
	Total:	\$170,762	\$26,633	\$15,270	\$0	\$0	\$186,032
	Total Goal 4:	\$682,460	\$143,429	\$151,487	\$0	\$288,400	\$833,947

<b>Wisconsin Project No.</b>	<b>Principal Investigator</b>	<b>Title of Project</b>	<b>Hatch Total (Regular &amp; Multistate)</b>	<b>Hatch Multistate</b>	<b>McIntire/ Stennis</b>	<b>Ani Hea</b>
----------------------------------	-----------------------------------	-------------------------	---	-----------------------------	------------------------------	--------------------

Wisconsin Project No.	Principal Investigator	Title of Project	Hatch Total (Regular & Multistate)	Hatch Multistate	McIntire/Stennis	Animal Health
-----------------------	------------------------	------------------	------------------------------------	------------------	------------------	---------------

## ***Impact Statements and Selected Results***

Publications in refereed journals, books, and extension bulletins have been reported on projects using the AD-421 annual reports in the CRIS system. A number of projects are listed in other goals but have impacts on agriculture or natural resources. Some of the projects had funding from Hatch, McIntire-Stennis, and Animal Health; others were funded from competitive federal programs and industry gifts and grants. Outputs described in the original Plan of Work are illustrated by example from the past year in the following projects.

### **Dishing up local foods**

***Key issues: Sustainable agriculture, organic agriculture, niche market***  
***Focus areas: Small farms and their contributions to local economies***

The issue: With more social awareness of where and how food is produced, university food service operators are finding that students are changing their food preferences. Many students now appreciate seeing locally grown and organic foods on dorm menus. Small growers often face marketing issues that limit their access to institutional markets. The organic demand is growing at 20 percent per year, but faces logistical barriers to some markets.

What's been done: On the UW-Madison campus, the Center for Integrated Agricultural Systems developed the College Food Project. The project helped University Housing Food Service administrators connect with state farmers who could supply locally grown and organic foods.

The impact: Between 1996 and 2001, campus dining centers prepared 20 special meals featuring locally grown and organic food. In 2000 the UW-Madison became the first Big 10 university to put locally grown food -- blue corn tortilla chips, apples, and potatoes -- on the everyday menu at dorm dining centers. The catering service at the Wisconsin Union and the chef at the University Club have now provided locally grown food at 12 conferences and events. The Wisconsin Union served local meals to 1,000 people attending a conference in July, 2001. Wisconsin growers provided food for the four meals. Overall, 30 Wisconsin farms and three farmer-owned cooperatives (representing hundreds of farmers) have provided food for local meals on campus. The College Food Project has also worked with eight colleges in Wisconsin to initiate, expand, or publicize local food purchasing.

For the third year, project personnel have been instrumental in organizing a major outreach event, the now annual Food For Thought Forum and Festival. Some 6,000 people attended and efforts will be undertaken to extend the model to other cities. The Farm Fresh Atlas, a listing of local producers, will be released to consumers this spring.

Funding – Hatch project, #WIS04051 “Commodities, consumers, and communities: local food systems in a globalizing environment (a part of multistate project NE-185); WIS04268, “

Institutional markets for sustainable agricultural products”; and State of Wisconsin.

### **Making Bt more effective against gypsy moth**

*Key themes: forest resource management, biological control*

*Focus areas: Improved pest control, sustainability of agriculture and forestry*

The issue: Gypsy moth is the most damaging pest of deciduous trees in North America. Millions of dollars are spent each year to prevent gypsy moth damage. Aerial spraying with Bt, an insecticide produced by a soil bacterium, is the most common method for treating gypsy moth outbreaks in wooded areas. Compared with other insecticides, Bt is considered a safe compound. It is approved for use in organic agriculture, for example, and is widely used to control agricultural pests. Therefore, it would be a major problem if the widespread use of Bt led to Bt-resistant populations of gypsy moth or other insect pests.

What’s been done: In laboratory studies, UW-Madison researchers tested what happened to gypsy moth caterpillars when they ate leaves containing Bt or leaves with Bt and the antibiotic zwittermicin A. Zwittermicin A is unlike any antibiotic used in human or veterinary medicine. Zwittermicin A itself did not kill gypsy moth larvae that ate it. However, when groups of gypsy moth larvae were fed a constant amount of Bt and different amounts of zwittermicin A, gypsy moth mortality increased in direct proportion to the amount of antibiotic in the diet. The scientists hypothesize that zwittermicin A alters the bacteria in the insect’s gut making Bt more lethal to caterpillars.

The impact: If the results are duplicated in field trials and if zwittermicin A could be used widely, the research may lead to applications that increase Bt’s potency, slow the appearance of Bt-resistant insect populations, and allow pest managers to apply smaller amounts of Bt if they also combine it with zwittermicin A. In addition, the research may provide insights that help scientists devise new and more effective methods to manage insect pests.

Funding -- Wisconsin Department of Natural Resources; McIntire-Stennis project #WIS04054 “Effects of plant defense chemistry on biological control of chemically defended/undefended pests”; McKnight Foundation; and Hatch project #WIS04038, “Resistance to Zwittermicin A”.

## **Goal 5. Enhanced economic opportunity and quality of life for Americans.**

### *Executive summary*

Under this goal, there were 21 projects including 7 that were multistate, interdisciplinary projects, 2 McIntire-Stennis projects and 4 that were integrated research/extension projects. Included among these projects are those addressing the public perceptions and consumer behavior, rural economies, and applications of statistical methods for interpreting data.

Wisconsin is committed to continually changing our portfolio of research. Four new projects have been added this year. Rural populations have been undergoing considerable change in economics. Stakeholders have brought the human dimension to the forefront in the

face of rural change. Three of these new projects address stresses in rural economic and social life: WIS03972 deals with the changing farm structure in the Wisconsin dairy industry, WIS04370 deals with the global aspects of agriculture and natural resources on rural life, and WIS04437 deals with the family issues of child labor on farms including farm safety. The increasing use of spatial data, particularly for geographic information systems and precision farming, has led to WIS04497 which develops new statistical methods for handling and interpreting this data.

### ***Updated project list for FY01***

New projects are printed in **bold**. Note that recent reclassification of projects has moved some projects into goals different from those previously listed in the Plan of Work. Some projects address several goals but are listed in only one.

Principal Investigator	Title of Project	Hatch Total (Regular & Multistate)	Hatch Multistate	McIntire/Stennis	Animal Health	Extension Activity	Total Formula Funds
<b>anced Economic Opportunity and Quality of Life for Americans</b>							
<b>Objective 5.1: To increase the capacity of communities and families to enhance their own economic well-being</b>							
Jasper, C. R.; Goebel, K.	FAMILY BUSINESSES: INTERACTION IN WORK AND FAMILY SPHERES (NE-167)	X	X				
Douthitt, R.	PRIVATE STRATEGIES, PUBLIC POLICIES, AND FOOD SYSTEM PERFORMANCE (NE-165)	X	X				
Freudenburg, W.R.	POVERTY, PROSPERITY AND NATURAL RESOURCES IN WISCONSIN	X					
Green, G. P.	EVALUATING THE OUTCOMES AND IMPACTS OF GROWTH MANAGEMENT EFFORTS IN NONMETROPOLITAN WISCONSIN	X				X	
Riggles, L. M.	THE REORGANIZATION OF LABOR PRACTICES IN THE FOOD PROCESSING SECTOR	X					
Slesinger, D. P.	THE IMPACT OF HEALTH INSURANCE ON HEALTH STATUS & MEDICAL UTILIZATION AMONG WISCONSIN FARMERS	X					
Deller, S. C.	RURAL ECONOMIC DEVELOPMENT: ALTERNATIVES IN THE NEW COMPETITIVE ENVIRONMENT (NE-162)	X	X			X	
Provencher, R. W.	THE ECONOMIC VALUE OF PRESERVING NATURAL AMENITIES IN REMOTE AREAS: LAKE SHORE			X			
	Total:	\$93,413	\$37,432	\$21,959	\$0	\$15,270	\$152,074
<b>Objective 5.2: To increase the capacity of communities, families, and individuals to improve their own quality of life</b>							
Sarmadi, M.	DEVELOPMENT OF TEXTILE MATERIALS FOR ENVIRONMENTAL COMPATIBILITY AND HUMAN HEALTH AND SAFETY (S-272)	X	X				

Principal Investigator	Title of Project	Hatch Total (Regular & Multistate)	Hatch Multistate	McIntire/Stennis	Animal Health	Extension Activity	Total Formula Funds
Ray, R. O.	INTENTIONS AND OUTCOMES: EDUCATION AND LEARNING IN STATE AND NATIONAL FORESTS IN WISCONSIN			X			
Trumbo, J.	VISUALIZATION AND VISUAL LITERACY IN SCIENCE COMMUNICATION	X					
Loew, P. A.	TRIBAL NEWSPAPERS & SOVEREIGNTY: A FRAMEWORK FOR UNDERSTANDING ATTITUDES ABOUT NATURAL RESOURCES IN WISCONSIN	X				X	
Gunther, A. C.	THE HOSTILE MEDIA EFFECT AND ITS CONSEQUENCES FOR SCIENTIFIC ISSUES	X					
Hitchon, J. C.	COSTLY CHARITY OR SMART STRATEGY? IMPACT ON CONSUMERS AND MANAGERS OF ADVERTISING WITH A SOCIAL DIMENSION	X					
Kleinman, D. L.	CITIZENSHIP AND THE KNOWLEDGE ECONOMY	X					
Barham, B. L.	IMPACTS OF STRUCTURAL CHANGE IN THE DAIRY INDUSTRY (NE-177)	X	X			X	
Lee, M. A.	RURAL RESTRUCTURING: CAUSES AND CONSEQUENCES OF GLOBALIZED AGRICULTURAL AND NATURAL RESOURCE SYSTEMS (S-276)	X	X				
Zepeda, L.	CHILD LABOR ALLOCATION AND WORK SAFETY ON WISCONSIN DAIRY FARMS	X					
	Total:	\$198,630	\$66,395	\$20,252	\$0	\$51,181	\$2
<b>Objective 5.3: Not Assigned</b>							
Buttel, F.	IMPACT ANALYSES AND DECISION STRATEGIES FOR AGRICULTURAL RESEARCH (NC-208)	X	X				
Clayton, M.	APPLICATION OF STATISTICS TO AGRICULTURE: ANALYSIS OF SPATIALLY AUTOCORRELATED CATEGORICAL DATA	X					
Zhu, J.	ANALYSIS OF SPATIAL DATA USING MULTI-SCALE STATISTICAL MODEL	X					

Principal Investigator	Title of Project	Hatch Total (Regular & Multistate)	Hatch Multistate	McIntire/Stennis	Animal Health	Extension Activity	Total Formula Funds
	Total:	\$58,100	\$22,873	\$0	\$0	\$0	\$
	Total Goal 5:	\$350,143	\$126,700	\$42,211	\$0	\$66,451	\$3
	Grand Total:	\$4,863,898	\$996,728	\$484,327	\$140,741	\$1,251,844	\$5,4

<b>Wisconsin Project No.</b>	<b>Principal Investigator</b>	<b>Title of Project</b>	<b>Hatch Total (Regular &amp; Multistate)</b>	<b>Hatch Multistate</b>	<b>McIntire/ Stennis</b>	<b>Ani Hea</b>
----------------------------------	-----------------------------------	-------------------------	---	-----------------------------	------------------------------	--------------------

Wisconsin Project No.	Principal Investigator	Title of Project	Hatch Total (Regular & Multistate)	Hatch Multistate	McIntire/Stennis	Animal Health
-----------------------	------------------------	------------------	------------------------------------	------------------	------------------	---------------

## ***Impact Statements and Selected Results***

Publications in refereed journals, books, and extension bulletins have been reported on projects using the AD-421 annual reports in the CRIS system. A number of projects are reported as impacts on agriculture or natural resources. Some of the projects had funding from Hatch, McIntire-Stennis, and Animal Health; others were funded from competitive federal programs and industry gifts and grants. Outputs described in the original Plan of Work are illustrated by example from the past year in the following projects.

### **Dynamics of farm family labor**

***Key issues: Children, youth and families at risk, family resource management, farm safety***  
***Focus area: Small farms and their contributions to local economies***

The issue: Farm families must make daily decisions about allocation of family labor. Children are often part of this workforce, which contributes to high rates of accidents among farm children. Decisions to stay in farming or to leave agriculture often depend on the balance of work and family life.

What's been done: Six hundred telephone interviews were conducted with farm couples as well as four focus groups to examine how decision are made in farm families about farm operations, time use, and use of intensive rotational grazing. Women were found to be involved in all farm activities except crops and machinery and to be important decision-makers on farms. Women with off-farm jobs had expanded roles in decision-making. Women were also found to be working longer hours on average (about 11% more per day than men).

Existing data about labor by children and accident statistics are being used to look at factors that influence safety, especially the factors that contribute to longer hours of work by children on farms. Economic status of fathers has been shown to be the largest influence on hours that children work.

The impact: Knowledge about how families decide to allocate time and what factors contribute to farm safety could provide guidelines to help families lower farm accidents and support family stability.

Funding – Wisconsin Hatch project #WIS04437, “Child labor allocation and work safety on Wisconsin dairy farms”; Wisconsin Hatch project #WIS05200, “Rotational grazing and the family farm: technology, economics, sustainability and gender”; State of Wisconsin through UW Center for Integrated Agricultural Systems.

## **Evaluation of success of multistate, multi-institutional and multidisciplinary activities**

The College of Agricultural and Life Sciences and indeed the entire UW-Madison campus place a high value upon faculty-driven, multistate, multi-institutional, and multidisciplinary activities. This traditional value has served science and the state well for many years. For the most part, UW Madison administrators take pride in breaking down barriers to multistate, multi-institutional, and multidisciplinary work so that faculty can form effective teams to address pressing problems and issues.

Interdisciplinary tradition and enthusiasm on the UW-Madison campus received recent reaffirmation in the creation of a faculty hiring strategy called “cluster hiring.” This hiring strategy encourages and rewards creation of new faculty positions that are interdisciplinary, inter-college, and inter-departmental in nature. A recent example of a cluster is one where four faculty members were hired to address food safety problems, particularly those related to mycotoxin contamination. New faculty members have been hired in areas of mycotoxin biosynthesis, mycotoxin genomics, food microbiology and toxicology (surface coatings), and human medicine – all with a focus of reducing human health dangers posed by mycotoxin and other contaminants of foods. Similarly, cluster hires are underway in land use planning, structural biology, chemical biology, genomics, and a host of other areas across campus. Recent permission has been given for recruiting for cluster hires in agroecology and symbiosis, which are likely to result in additional hires for College of Agricultural and Life Sciences.

Discussions under each of the goals previously presented in this report identify multistate, multi-institutional research projects, as well as those that have integrated research and extension objectives. Those data will not be cataloged again here. UW-Madison faculty members are heavily involved in North Central Regional research projects, and have competed effectively as part of multistate teams in the new Initiative for Future Agriculture and Food Systems grant program. Dairy Extension programming in the Upper Midwest functions to a considerable degree on a multistate basis. For many years, Wisconsin has made its Lancaster Agricultural Research Station available to joint research projects with Iowa State University, the University of Illinois, and the University of Minnesota. Collaborative efforts result in research projects directed at cropping, and soil and water conservation issues on the unglaciated soils found at the station. This cooperative research effort has well served those agricultural interests which share common challenges of farming on hilly, unglaciated terrain found in the nearby four-state region. Four midwest states (ND, MN, WI and MI) formed a new multistate project in potato research and extension that was approved in 2001 and plans on writing a project for multistate funding in spring 2002.

The UW-Madison College of Agricultural and Life Sciences participates in a UW System Consortium for Agricultural and Natural Resources Research, Extension, and Instruction. The purpose of the consortium is to conduct collaborative research among investigators at UW-Madison, UW-Platteville, UW-River Falls, and UW-Stevens Point, in addition to bringing better coordination to instructional and extension programs operated by the four Wisconsin universities. The Midwest Poultry Science Undergraduate Center of Excellence is yet another example of multistate programming in the instructional area that has great value in offering students from a number of different institutions educational opportunities that otherwise would

not be available to them. This program is organized through the UW-Madison. Multistate and multi-institutional programming in all three land grant functional areas (research, extension, and instruction) is a strategy that individual states and institutions adopt with increasing enthusiasm as budget constraints press down.

Multistate, multi-institutional, and multidisciplinary programs have been effective in addressing needs of stakeholders. An example of this effectiveness can be found in a new Wisconsin effort called the Agricultural Stewardship Initiative, which is directed at the state's huge livestock industry. This program came into being because Wisconsin livestock and dairy producers face growing challenges and regulations in managing and utilizing animal wastes in ways that do not degrade the natural resource base or the environment. Farmers asked that state agencies, the university, the industries and producer organizations to listen to their concerns and develop effective programs to address those concerns.

The Agricultural Stewardship Initiative was developed as an answer to agricultural producer concerns. It is made up of component research, a systems farm, and a network of Discovery Farms to evaluate and demonstrate appropriate waste management and nutrient cycling technologies and practices. Key to the entire effort is farmer-driven research, demonstrations, and education programs. Throughout the initiative's development and its early operation, there has been intensive producer input. Five farms have agreed to become Discovery Farms in 2001, including an organic grazing operation.

As a measure of success in translating research into usable results, the patent record of the University of Wisconsin is outstanding. The College of Agricultural and Life Sciences contributed an average of 92 patent disclosures per year over the last 6 years. Based on a study of U.S. universities done by Purdue University<sup>1</sup>, the average rate of disclosure in universities is 1 per \$2 million of federal research support. CALS average between 1995 and 2000 was 2.56 times this average. Not all disclosures result in patents with a generally accepted guideline of one patent per 4 disclosures (.25 acceptance rate). CALS average over this time period (.479) was almost twice this benchmark. Formula funding represents only a small portion of our federal funding (around 8 % in state fiscal year 2001), but was listed as primary funding on 20 of the patent disclosure and contributing funding on 7 more. We feel this record supports our competitive process for funding projects and our emphasis on applied problem solving as a target for use of these funds. Many of the examples listed in this report are taken from the list of patents awarded to CALS faculty.

User input and program response to that input is also referenced in each to the goals sections. It will not be repeated here, other than to stress that great amounts of energy are devoted to meeting with various user groups and incorporating their suggestions and needs into research and extension programming.

---

<sup>1</sup> "A study of selected university technology and technology-transfer programs", Research and Sponsored Programs of Indiana University-Purdue University at Indianapolis, July 1990.

## *Serving the entire community*

The Wisconsin Agricultural Experiment Station makes sincere efforts to serve the needs of consumers, minority populations, small landowners, alternative agriculture, and non-traditional clientele. Below lists a number of research projects that relate to these special client groups. Note that three of the following projects are multistate, multidisciplinary projects.

Projects serving underrepresented and minority populations:

Population	Project	Principal Investigator(s)	Title
Non-traditional farms	WIS05227	Cropp, R. A. leading an interdisciplinary team	ADOPTION OF ALFALFA BIOFORAMING TO ENHANCE RURAL ECONOMIC DEVELOPMENT
Young adults	WIS03967	Nitzke, S. A.	USING STAGES OF CHANGE MODEL TO PROMOTE CONSUMPTION OF GRAINS, VEGETABLES AND FRUITS BY YOUNG ADULTS (NC-219)
Urban horticulture	WIS04442	Jull, L.G.	EFFECT OF DEICING CHEMICALS ON WOODY ORNAMENTAL PLANTS
Sustainable agriculture/organic producers	WIS04051	Kloppenburg, J. R.; Stevenson, G. W.	COMMODITIES, CONSUMERS, AND COMMUNITIES: LOCAL FOOD SYSTEMS IN A GLOBALIZING ENVIRONMENT (NE-185)
Organic producers	WIS04317	Goodman, R. M.	ANALYSIS OF MICROBIOTA ASSOCIATED WITH PLANT ROOTS IN COMPOST-AMENDED FARM SOIL
Children	WIS04437	Zepeda, L.	CHILD LABOR ALLOCATION AND WORK SAFETY ON WISCONSIN DAIRY FARMS
Children	WIS04017	Pingree, S.	CHILDREN AND THE NEW MEDIA ENVIRONMENT
Low income	WIS04040	Freudenburg, W.R.	POVERTY, PROSPERITY AND NATURAL RESOURCES IN WISCONSIN
Native Americans	WIS04282	Loew, P. A.	TRIBAL NEWSPAPERS & SOVEREIGNTY: A FRAMEWORK FOR UNDERSTANDING ATTITUDES ABOUT NATURAL RESOURCES IN WISCONSIN
Families/ small business owners	WIS03858	Jasper, C. R.; Goebel, K.	FAMILY BUSINESSES: INTERACTION IN WORK AND FAMILY SPHERES (NE-167)
Minority farm workers	WIS04044	Slesinger, D. P.	THE IMPACT OF HEALTH INSURANCE ON HEALTH STATUS & MEDICAL UTILIZATION AMONG WISCONSIN FARMERS
Small woodlot owners	WIS04505	Rickenbach, M.G.	COOPERATION AMONG WOODLAND OWNERS: A CASE STUDY OF ORGANIZATIONAL FORMS AND PARTICIPANT MOTIVATIONS

Women foresters	WIS04323 MCINTIRE- STENNIS	Thomas, C.; Houghton, J.	ASSESSING THE EDUCATIONAL NEEDS OF WOMEN WHO OWN NON- INDUSTRIAL PRIVATE FOREST LAND IN WISCONSIN
-----------------	----------------------------------	-----------------------------	--

Although formal evaluations have not been done to determine the effectiveness of these efforts, there is ample field experience and observations to support the contention that they do have significant impact on the problems and populations addressed. See earlier presented research impact statements.

## Stakeholder Input Process

Stakeholder input for the development and conduct of research relating to state needs has been accomplished in a tiered system. The College of Agricultural and Life Sciences has a central Advisory Board (CALS Board of Visitors) that meets twice a year with the Dean and Associate Deans. Members of this committee (see Appendix B for current list of members) are selected from a wide range of producer, industry, consumer, environmental groups, and state agencies. In addition to advisory groups, the Dean of CALS has been meeting with small groups of leaders representing Wisconsin organizations (see Appendix C) for roundtable discussions. These meetings include traditional and non-traditional stakeholders (invitees included in original Plan of Work).

The Dean and Associate Deans attend many meetings of organizations concerned with our research priorities. Faculty regularly attend national scientific conferences and are members of national and international scientific committees. Many attend national forums for research priority setting such as the FAIR 2002 (Food Animal Integrated Research Symposium) and CROPS 99 (Coalition for Research on Plant Systems). These national conferences include stakeholders and representatives from federal agencies. Many departments, centers, and institutes maintain advisory committees that meet periodically with researchers in the units. Additionally, faculty regularly attend events with agricultural, natural resource, and community service activities.

Wisconsin Cooperative Extension has developed 15 system and issue teams (comprised of University research and Extension professionals, other agency personnel, and producers) to develop educational programs directed at both farm and industry clientele. System teams conduct applied research and educational programming that address issues and problems specific to commodities (dairy, beef, swine, sheep, grain crops, forages, vegetable crops, fruit crops, and urban agriculture/horticulture). Issue teams deal with integrated issues across the agricultural systems (marketing and risk management, farm business management, nutrient management, land use and agriculture, food safety and quality, and new and emerging farm and agricultural markets). Principal investigators with Hatch, McIntire-Stennis, and Animal Health grants are members of both system and issue teams.

Implementation of research priorities in the formula funding process is accomplished through a compilation of the departments' research priorities based on their interactions with stakeholders. Department chairs were asked to provide a small number of research topics from each unit of CALS for use in annual Hatch and McIntire-Stennis calls for proposals. The Dean and Associate Deans assembled a list of common themes from this set that is included in this year's call for proposals. In 2001, a revised list of priorities has been collected to be issued with the call for proposals for 2002.

For the Animal Health process, every two years, the Association of American Veterinary Medical Colleges (AAVMC), with numerous co-sponsors, organize a two-day listening conference entitled "Critical Issues in Animal Health Research Conference." Representatives from major and minor commodity groups present their positions on the most critical area for research investment. The Associate Dean of the School of Veterinary Medicine (SVM) attends and helps organize this national conference. The SVM has a Board of Visitors, which meets twice a year with SVM administration and faculty to provide input on critical research issues. Faculty reviewers of proposals annually attend a meeting of a variety of stakeholder groups such as the American Veterinary Medical Association, the National Pork Producers, the Bovine Practitioners Association, and the National Turkey Growers Association.

At UW-Stevens Point, concurrent with the distribution of request for proposals, members of the UWSP Forestry Advisory Committee were contacted and asked to submit priority areas of forestry-related research needs in Wisconsin. The committee consists of 21 members who are recognized as leaders in the forestry and conservation community in the State of Wisconsin.

University of Wisconsin –Extension also has a stakeholder process used for setting priorities. Details are available in pdf format at

<http://www.uwex.edu/ces/pdande/ProgramPlanning/statewide.html>

Since many of our faculty have a joint appointment in UW-Extension, this stakeholder input is also used in setting research priorities in programs by those joint faculty and other colleagues in their departments.

CALS administrative activities for planning and input:

November 2001 April 2001	CALS Board of Visitors (advisory committee, see Appendix B for current members)	CALS Executive Staff and Deans, Dept. chairs of departments
June 2001	All day administrative retreat	CALS Deans and chairs of departments
December 2001	CALS budget retreat	CALS Deans

### Areas of Identified Research Need for Wisconsin

Meetings with stakeholders, such as those listed above, are utilized to identify research needs specific to Wisconsin. Faculty meet regularly with a number of college and departmental advisory groups, commodity organizations, state agencies, consumer groups, and private citizens. Input from these stakeholders and from those who are performing the research is used to help highlight areas of research need. Every other year, department chairs are asked to provide a small number of research topics from each unit of CALS for use in Hatch and McIntire-Stennis calls for proposals. The Dean and Associate Deans of the College of Agricultural and Life Sciences work on these needs to identify a set of goals for use in the Hatch and McIntire-Stennis call for proposals. Reviewers are provided these priorities as is the Research Advisory Committee that ranks the proposals for funding. The following is a compilation of common themes identified and published in the UW-Madison Call for Proposals in summer 2001.

1. Mechanisms of pest and pathogen resistance and control that minimize effects on environmental quality and human health.
2. Effects of change in global climate, population pressures or public policy on agricultural production, natural resources, and future land use.
3. Identification of socioeconomic forces that shape the viability of rural industries and employment including agriculture, forestry, and other land uses.
4. Research on human perceptions and access to information on food choices, food safety, environmental protection, and biotechnology.
5. Sustainable agricultural and forestry production and processing systems that provide improved food safety, environmental protection, and human well being.

### **Program review process**

Hatch, McIntire-Stennis, and Animal Health funds are used for specific projects solicited in an annual call for proposals. Animal Health proposals are reviewed at the School of Veterinary Medicine; Hatch and McIntire-Stennis proposals are reviewed in CALS.

CALS process:

The following is published in the call for proposals as guidance to the scientists requesting Hatch or McIntire-Stennis funding. This process occurred in November of 2001 for 62 new proposals. One additional call for proposals was made in Spring 2001 for scientists requesting multistate research funding. A similar review process was done for multistate funding with the smaller subset of proposals already approved through the regional Experiment Station director's processes in March 2001.

### **The Faculty Review Panel (FRP):**

*The Associate Dean for Research will choose members of the FRP in consultation with the Research Advisory Committee (RAC). Each proposal will be reviewed by two members of the FRP and at least two other (ad hoc) reviewers. The CALS Research Division, in consultation with RAC members, will make the identification of the ad hoc reviewers. Where possible, ad hoc reviewers will be CALS faculty, though other reviewers both on and off campus may be appointed as necessary. The critical criteria for selection of FRP members and ad hoc reviewers will be scientific excellence, appropriate disciplinary expertise, and overall balance. No member of the FRP will have a proposal under review.*

### **Review Criteria for Reviewers:**

*Reviewers are asked to critique and evaluate proposals in a constructive way, identifying both the strengths and weaknesses of the proposal(s) reviewed. Reviews should be concise and include comments addressing each of the following criteria:*

- *An evaluation of the scientific significance of the objectives and appropriateness of the research approach as indicated in the original Congressional Acts and CSREES Goals.*
- *A judgement of the potential usefulness to society of the research, in the short and/or long term. Problem solving is a key feature of the formula funding guidelines.*
- *An evaluation of the ability of the research team to accomplish the stated objectives and the match between the objectives and available resources. For teams with multiple investigators, please include a plan of coordination of the work across laboratories or departments.*

### **Review Process:**

- *Copies of the proposal will be sent to two members of the Faculty Review Panel (FRP) and at least two ad hoc reviewers. Each reviewer will prepare a written critique of the proposal and rank the proposal from excellent to unacceptable. The reviews will be submitted to the CALS Research Division and recorded anonymously upon receipt. The two FRP reviewers will receive copies of all reviews (anonymity maintained) on which they are primary or secondary reviewers prior to the FRP meeting so they may be prepared to lead the discussion on the proposals assigned to them.*
- *A meeting will be held of FRP to discuss proposals. Prior to the meeting, copies of all reviews will be provided to FRP members.*

- *At the meeting, the primary reviewer will give a short description of the proposal, the principal investigator's background, and his/her own critique. The secondary reviewer will provide his/her own critique and raise any other points that have been overlooked. Where the FRP has insufficient expertise in the proposal area, an ad hoc reviewer may be brought in as primary or secondary discussant. Comments from ad hoc reviewers will be provided by the primary reviewer and confusing issues clarified.*
- *An approximate placement will be made with respect to proposals as discussion takes place. Obviously this placement will involve some degree of reconsideration of previously placed proposals. Because of this process, an inappropriately negative external review will not condemn a proposal. At the end of the process, FRP members will go over the list and look for any inappropriate placement. The prioritized list will be forwarded to the Associate Dean for Research.*
- *The primary reviewer of each proposal will prepare a summary of the written review comments and FRP discussion. The summary and reviews from individual reviewers will be returned to applicants.*

The Research Advisory committee of CALS (12 faculty including representation of the School of Human Ecology) approves the guidelines for Hatch proposals, review, and funding. The committee has changed the wording slightly from year to year, but no substantial change in the review process has occurred from the Plan of Work description submitted in July 1999.

#### SVM Process

Animal Health proposals are reviewed by a faculty committee appointed by James Tracy, Associate Dean for Research, UW-Madison School of Veterinary Medicine. Proposals for research grants from Animal Health Formula Funds are reviewed by the Research Committee of the School of Veterinary Medicine (SVM) in a dual peer review process. After receiving and reading all proposals, the Research Committee first meets to select two peer reviewers, experts in the area of each proposal. These experts are asked to comment both on the scientific merit as well as the relevancy to animal health and specifically to health of livestock in Wisconsin. The Associate Dean for Research of the School of Veterinary Medicine together with the Research Committee from the SVM reviews the overall portfolio of research projects sponsored by the Animal Health Formula Funds make sure that the portfolio of projects is representative of the livestock health issues in Wisconsin.

#### UW –Stevens Point Process

The McIntire-Stennis Proposal Review Panel consists of five members, three from the College of Natural Resources and two from the forestry community in Wisconsin. Each review panel member is asked to rank the proposals using the following criteria: scientific and technical merit, ability of the principal investigators to perform the research potential for publishable results, and recommended research topics by the UWSP Forestry Advisory Committee. Decisions are made by the Victor Phillips, Dean of the College of Natural Resources, UW-Stevens Point.

## **Integrated Research and Extension Activities**

Our integrated research and extension activities are organized into projects that have been listed under the appropriate goals. Brief descriptions of activities are included as examples of the integration in those sections.

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

Wisconsin Agricultural Experiment Station, College of Agricultural & Life Sciences
Wisconsin

	<b>Multistate Extension Activities</b>
<b>x</b>	<b>Integrated Activities (Hatch Act Funds)</b>
	<b>Integrated Activities (Smith-Lever Act Funds)</b>

**Expenditures**

<u>Named Program/Activity</u>		<b>FY 2001</b>
<u>and Research and Extension</u>		
<u>Project lists under goals and descriptions</u>		1,251,844
		1,251,844

entine

\_\_\_\_\_  
**Executive Director**

\_\_\_\_\_  
**Date**



## **Appendices**

### ***Appendix A – Science Report and CALS Quarterly (3 issues)***

(Not included in electronic version, hard copy by separate mailing)

Additional news stories and electronic version of Science Report available at

<http://www.cals.wisc.edu/>

*Appendix B – CALS Advisory Committee membership*

**CALS Board of Visitors. September 2001**

Mr. Stephen S. Becker ('02)  
Becker Food Company, Inc.

Dr. Peter Huettl ('04)  
Applied Sciences, Inc.

Dr. James R. Behnke ('03)  
Advisor to the CEO Pillsbury Corporation

Mr. Pete Kappleman ('04)  
Dairy Farmer

Ms. Linda Bochert ('01)  
Michael Best & Friedrich  
Environmental Law Firm

Mr. Ralph Kauten ('02)  
PanVera (Biotech) Company

Mr. Steve Braunginn ('04)  
Urban League of Greater Madison, Inc.

Mr. Bliss Nicholson ('04)  
The Bruce Company

Ms. Margaret Dohnalek ('04)  
Abbott Laboratories International  
Nutritional Products

Mr. Rod Nilsestuen ('04)  
Wisconsin Federation of Cooperatives

Ms. Kay A. Finch ('02)  
Perry Creek Cranberry Co.

Mr. Doug Quick ('04)  
Lakeside Foods

Mr. Gordon Foss ('04)  
Badgerland Farm Credit Services

Mr. Roger Ripley ('04)  
Accelerated Genetics

Mr. John Hansen ('02)  
Nesnah Group

Mr. Tom Strachota ('04)  
Dairyland Seed Company, Inc.

Dr. Robert Horsch ('04)  
Monsanto Company

Ms. Leigh Tuckey ('04)  
LeighBert Farms

Ms. Linda Wenck ('02)  
Morgan & Myers/The Barkin Group



## Appendix C – Dean’s roundtable meetings

February 1, 2001 -- General Farm Organizations Roundtable

February 19, 2001 -- Food Processing and Marketing Roundtable

February 23, 2001 -- Forestry and Green (Horticultural/Turf) Industry Roundtable

March 9, 2001 -- Plant production Roundtable

March 16, 2001 -- Meat and Dairy producers and industry Roundtable

March 23, 2001 -- Environmental Organizations Roundtable

November 16 – 17, 2001 -- CALS Board of Visitors’ Fall meeting

April 19-20, 2001 -- CALS Board of Visitors’ Spring meeting