2011 Michigan State University Combined Research and Extension Plan of Work

Status: Accepted

Date Accepted: 05/28/2010

I. Plan Overview

1. Brief Summary about Plan Of Work

Michigan State University (MSU), the state's land-grant institution, is charged with generating research-based knowledge and educational programs people can access to make informed decisions to improve their lives. The mission of the Michigan Agricultural Experiment Station (MAES) is to engage in innovative, leading-edge research that ensures the wise use of agricultural, natural and community resources and enhances the quality of life in Michigan, the nation and the world. MAES strives to maintain a balance between basic and applied research and relies heavily on the input of its constituents in identifying research priorities. Michigan State University Extension (MSUE) helps people improve their lives through an educational process that applies knowledge to critical issues, needs, and opportunities.

The success and accomplishments of the MAES and MSUE are fueled by close ties with each other, as well as close linkages to state agencies, commodity groups and other stakeholders, plus outstanding legislative support.

Agriculture is Michigan's second largest industry. The state's agrifood system accounts for $71.3 billion in total economic activity (direct and indirect) and more than 1 million jobs. The direct economic impact of the agri-food system is estimated to be $42.6 billion; the direct economic impact of the agri-energy system (ethanol) is estimated to be $600 million. In total, the agricultural/food system employs a quarter of all people working in Michigan. The system is likely second only to the auto industry in importance to the state's economy. Michigan also has one of the most diverse agricultural industries in the United States. The state is second only to California in variety of crops grown. From field crops such as corn, wheat and soybeans to fruits such as cherries, apples, grapes and blueberries; to horticultural crops such as ornamental trees and flowering plants; and livestock, honey and fish, Michigan grows just about anything one can think of except citrus.

At the same time, Michigan is a state defined, literally, by water. Without the Great Lakes, Michigan's peninsulas and much of the state's agriculture, shipping and tourism offerings wouldn't exist.

For Michigan and MSU, the possibilities to expand ties between industry and agriculture go far beyond alternative energy. The state is uniquely positioned to build a new biobased economic sector upon the existing foundation of its agriculture, forestry, natural resources, industrial and manufacturing sectors. The result would be the advancement of a new, sustainable biobased sector that provides a competitive advantage in meeting the growing global demand for renewable sources of materials, chemicals and energy in products, processes and packaging.

MAES and MSUE have the research, education and outreach capabilities to partner with other MSU units and with other Michigan universities to drive Michigan forward to achieve this goal. MAES and MSUE have created a statewide, cohesive plan that uses the MSU research capability and knowledge base. This plan fosters economic development, improved quality of life, a healthy environment and a plentiful and secure food supply for all Michigan residents.

It is important to note that this report reflects only a portion of MAES and MSUE and not the whole breadth of research and educational initiatives. MAES total budget for 2009 was $115.4 million with this report representing $4.47 million in federal Hatch dollars and equivalent match. MSUE's total funding in 2009 was over $88 million with this report representing approximately $8 million federal formal dollars and equivalent match.Due to the complexity of the funding sources, matching of funds and inadequate information systems this Plan of Work was limited to federal dollars and match.

In examining the new NIFA priorities, MSUE estimates that approximately 30% (22.75 FTE) of the current FTEs (76.55 FTE) could shift from the existing plans to the new NIFA priorities, as indicated in the following tables below. Due to the short time and inability to get good estimates of the outputs and outcomes for these new priorities (as well as adjust the current plans), they were not added at this time to the Plan of Work and will be included in the following year.

MSUE Federal Planned Programs-federal fte (76.55)

1. Human Health, Environment, Family, Youth, Society and Community(**31.5)**
2. Soil, Water and Natural Resources (**5.4)**
3. Plant Sciences (**16.2)**
4. Food and Non-Food Quality, Nutrition, Engineering and Processing **(.05)**
5. Economics, Marketing and Policy **(16.2)**
6. Animal Production and Protection **(6.75)**

MSUE Federal Planned Programs with New NIFA Priorities - federal fte (76.55)

1. Human Health, Environment, Family, Youth, Society and Community **(24.5)**
2. Soil, Water and Natural Resources **(4.4)**

3. Plant Sciences **(5.2)**
4. Food and Non-Food Quality, Nutrition, Engineering and Processing **(0.5)**
5. Economics, Marketing and Policy **(14.2)**
6. Animal Production and Protection **(5)**

Global Food Security and Hunger **(7)**
Climate Change **(4)**
Childhood Obesity **(7)**
Food Safety **(4.75)**

Estimated Number of Professional FTEs/SYs total in the State.

Year	Extension		Research	
	1862	1890	1862	1890
2011	153.0	0.0	90.0	0.0
2012	152.0	0.0	90.0	0.0
2013	151.0	0.0	91.0	0.0
2014	150.0	0.0	92.0	0.0
2015	150.0	0.0	92.0	0.0

II. Merit Review Process

1. The Merit Review Process that will be Employed during the 5-Year POW Cycle

- Internal University Panel
- External University Panel
- External Non-University Panel
- Expert Peer Review

2. Brief Explanation

The challenges facing Michigan agriculture and natural resources are increasingly complex and diverse. MAES research programs are continuously evaluated for relevance and progress. A strategic visioning process, linked to those of MAES-affiliated colleges at MSU (Agriculture and Natural Resources, Veterinary Medicine, Engineering, Human Ecology, Social Science and Natural Science), has identified five strategic priority areas that will drive the MAES research agenda over the next decade. This process also involves industry experts, university faculty members, the interested public, elected officials and MSU Extension and Experiment Station Council members, and includes scientific review by peers (local, national and international) and industry experts. These target areas address the research priorities of Michigan agriculture and natural resources industries, but are also linked to national goals and new initiatives. The target areas are: Food and Health, Environmental Stewardship and Natural Resources Policy and Management, Enhancing Profitability in Agriculture and Natural Resources, Secure Food and Fiber, and Families and Community Vitality.

Michigan State University Extension (MSUE) uses several continuous processes that assist in setting priorities and evaluating program goals and plans. At the county level, the public, local government officials, advisory group members, extension council members, staff members and industry experts are involved in both the stakeholder process and review of the county and individual agents' plans. Each Area of Expertise (AoE) Team reviews the county needs, agents' plans, and research to support these programs as well as others that may reflect emerging trends. In addition, the AoE goals are reviewed by state leaders and industry experts for quality and relevance. Collectively these

plans are reviewed by MSUE and MAES directors who not only evaluate them, but use them in their regional and statewide presentations to describe future plans.

Jointly, MSUE and the MAES address issues of concern in local communities with research and teaching by using a network of citizen advisory groups at the local and state levels. County Extension councils identify and prioritize issues, seek collaborations and resources, and communicate to others the importance of Extension's educational programming. Citizen Advisory Councils help establish research priorities at the 15 MAES field research stations. The MSU Extension and Experiment Station Council serves as a liaison among county councils, field station advisory groups and state agencies and organizations.

III. Evaluation of Multis & Joint Activities

1. How will the planned programs address the critical issues of strategic importance, including those identified by the stakeholders?

As the state's land-grant institution, MSU is charged with generating research-based knowledge and educational programs so that people can make informed decisions to improve their lives. To accomplish this important mission, the MAES and MSUE are constantly evaluating and updating the areas they focus on to best meet the ever-changing needs of Michigan's people, industries and communities. As the state's priorities change, research and educational programs, research agendas and external relationships also must change.

MAES and MSUE work collaboratively to gather public input on the issues of greatest concern to Michigan citizens. An issues identification process, Strengthening Michigan's Economy, ensured that relevant, research-based educational programming is available to address local issues for the past five years (2005-2009). A new issues identification process, Advance Michigan, will be launched in April 2010, to revisit priorities from the previous survey and gather new information to inform continuing and new research and educational programming over the next five years. Both organizations continue to use and fine-tune this input to guide state-level decisions for research priorities and program support. Additional surveys, focus groups, conferences and meetings build on and enhance baseline data collected. Due to stakeholder input, MSUE and MAES have focused more sharply on biobased products that can help boost the Michigan economy, including fuels, chemicals, nutraceuticals and food products, as well as youth and family issues, the environment, land use issues and biotechnology.

2. How will the planned programs address the needs of under-served and under-represented populations of the

Soil, Water and Natural Resources: Urban sprawl and community vitality research and education programs are partnering with local urban agencies and groups that have never worked with MSUE or the MAES before. Program directors have made sure that under-served people are members of advisory and planning boards. Plant Sciences: Of the 52,800 farms in Michigan, about 205 are classified as organic with 45,500 certified organic acres**.** Organic growers and growers who are considering incorporating more organic production practices into their operations have been asking for research on pest control methods that meet organic certification standards. In partnership with Michigan Food and Farming Systems (MIFFS), the USDA Risk Management Agency and the Black Farmers Association, programs are reaching underrepresented racial/ethnic farm operators. Food Quality, Nutrition and Processing: Economics, Marketing and Policy: Destination marketers and technology managers are non-traditional audiences. Many research programs employ multi-cultural graduate and post-graduate students. Human Health, Environment, Family, Youth, Society and Community: Individuals, families and communities that are low income, at risk, and under-served are targeted in this area through family resource management, parenting and community development programs. 4-H after-school programs are used to target non-traditional audiences.

3. How will the planned programs describe the expected outcomes and impacts?

Each of the planned programs have specific outcomes that are expected to happen during the five-year plan of work. In some programs, the specified outcomes and impacts are scheduled to happen in the first or second year, but other outcomes will continue to occur throughout the five-year period and beyond. Under each planned program, specific progress toward the outcomes and impacts will be documented.

4. How will the planned programs result in improved program effectiveness and/or efficiency?

MSUE and MAES programs have a well-documented history of increasing efficiency, improving productivity, both of which result in better quality of life for the state's residents. Because of their close working relationship, MSUE education programs are research-based, and the results of MSUE programs inform MAES research. Specific examples of this tightly integrated interaction are provided in each planned program section.

IV. Stakeholder Input

1. Actions taken to seek stakeholder input that encourages their participation

- Use of media to announce public meetings and listening sessions
- Targeted invitation to traditional stakeholder groups
- Targeted invitation to non-traditional stakeholder groups
- Targeted invitation to traditional stakeholder individuals
- Targeted invitation to non-traditional stakeholder individuals
- Targeted invitation to selected individuals from general public
- Survey of traditional stakeholder groups
- Survey of traditional stakeholder individuals
- Survey of the general public
- Survey of selected individuals from the general public
- Other (Conferences and meetings)

Brief explanation.

A variety of strategies and approaches were used in the past year to encourage stakeholder participation for a number of key activities and undertakings:

MSU Extension is in the midst of a major restructuring effort to reinvent itself to better meet the challenges of the 21st century. MSUE staff participation was encouraged by: publishing weekly newsletters from the MSU Extension Director to share information on the progress of the restructure and to solicit staff feedback; using the MSU Extenstion portal to post information and collect feedback from staff; and holding five Town Hall meetings at various locations across the state to discuss the MSUE restructuring plan and solicit staff input to guide the plan and to identify and develop four new institutes within the MSU Extension framework -- Preparing Michigan's Children & Youth for the Future, Enhance Michigan's First Green Industry: Agriculture and Agribusiness, Improve Health and Nutrition for Michigan Residents, and Greening Michigan: Leveraging Natural and Human Assets for Prosperity. Further, numerous individual meetings were held with staff, stakeholder advisory groups and the MAES/MSU Extension State Council related to the development of MSU Extension institute areas and what they should be. Meetings were also held with the Michigan Association of Counties and state legislators. Now that the framework for the redesign and the four institutes have been established, a comprehensive needs assessment -- AdvanceMichigan -- to seek input and direction from staff, internal and external stakeholders, and the general public on what the programmatic priorities should be within each of the institutes. The development of the survey instrument and communications campaign have been in process since Fall 2009. The survey will be launched in April 2010 and run through June 2010. Survey results will then be compiled and used to develop a logic model for specific program priorities in each institute and a statewide plan of work.

As mentioned in previous plans of work, MSU Extension contracted with the Institute for Public Policy and Social Research (IPPSR) to include questions related to MAES and MSU Extension programmatic priorities on its State of the State Survey (SOSS) for three years (2007 to 2009). In 2009, survey questions were posed related to perceptions about entrepreneurship. In addition, targeted surveys to collect information on the Michigan equine industry, the Michigan dairy industry and trends in farmers perspectives on MSU Extension were also conducted. The results of these surveys are included in the "What you Learned from Your Stakeholders" section of this overview.

2(A). A brief statement of the process that will be used by the recipient institution to identify individuals and groups stakeholders and to collect input from them

1. Method to identify individuals and groups

- Use Advisory Committees
- Use Internal Focus Groups
- Use External Focus Groups
- Open Listening Sessions
- Needs Assessments

- Use Surveys

Brief explanation.

With a mission to generate knowledge through strategic research to enhance agriculture, natural resources, and families and communities in Michigan, MAES has an extremely broad and long list of stakeholders. In reality, every Michigan citizen is an MAES and MSUE stakeholder. Using the methods checked above, the emphasis is on keeping up-to-date on key internal and external stakeholders, legislative contacts and the "interested public" and using a blend of traditional and online platforms to reach individiuals and groups and collect input from them.

The Advance Michigan online issues identification process being initiated (and the previous Strengthening Michigan's Economy process) and ongoing efforts offer multiple ways for people in various roles and locations to help identify the issues and opportunities for MAES research priorities and MSUE educational programming during the years ahead.

Statewide telephone surveys for the State of the State Survey (SOSS) and citizen focus groups are used to identify the major issues and opportunities in Michigan and assign a priority ranking to each.

Community-based discussions in all Michigan counties, involving the local MAES advisory committees, MSUE councils and others are held to discern what issues and opportunities stakeholders believe should be addressed related to research and programming. Community groups, commodity and producer groups and other state and local partners are periodically asked what specific issues and opportunities should be addressed.

Faculty focus groups, with representatives from MSU colleges and units, are held as needed to glean faculty perceptions on emerging Michigan issues and opportunities and identify ways that MSU science might address them. MSU faculty and MAES/MSUE staff surveys are used as needed to develop a better understanding of the university's ability to respond to issues identified in faculty focus groups.

County teams, including MAES field station managers, synthesize and submit local priorities identified by local MSUE councils and MAES advisory committees.

Area of Expertise (AoE) teams synthesize and prioritize content-specific program and research needs generated from the input of their advisory bodies and continue to fine tune these needs as additional input is received.

2(B). A brief statement of the process that will be used by the recipient institution to identify individuals and groups who are stakeholders and to collect input from them

1. Methods for collecting Stakeholder Input

- Meeting with traditional Stakeholder groups
- Survey of traditional Stakeholder groups
- Meeting with traditional Stakeholder individuals
- Survey of traditional Stakeholder individuals
- Meeting with the general public (open meeting advertised to all)
- Survey of the general public
- Meeting with invited selected individuals from the general public
- Survey of selected individuals from the general public

Brief explanation.

Several methods are used to collect stakeholder input:

MSU Extension is in the midst of a major restructuring effort to reinvent itself to better meet the challenges of the 21st century. MSUE staff participation was collected via the MSU Extenstion portal, five Town Hall meetings at various locations across the state, numerous individual meetings with staff, stakeholder advisory groups and the MAES/MSU Extension State Council. Meetings were also held with the Association of Counties and state legislators. A comprehensive needs assessment -- AdvanceMichigan -- to seek input and direction from staff, internal and external stakeholders, and the general public on what the programmatic priorities should be within each of the institutes will be launched in April 2010 and run through June 2010. Survey results will then be compiled and used to develop a logic model for specific program priorities in each institute and a statewide plan of work.

As mentioned in previous plans of work, MSU Extension contracted with the Institute for Public Policy and Social Research (IPPSR) to include questions related to MAES and MSU Extension programmatic priorities on its State of the State Survey (SOSS) for three years (2007 to 2009). In 2009, telephone survey questions were posed

related to perceptions about entrepreneurship in Michigan.

Targeted surveys to collect information on the Michigan equine industry, the Michigan dairy industry and trends in farmers perspectives on MSU Extension were also conducted to collect data from these selected individuals and groups.

3. A statement of how the input will be considered

- In the Budget Process
- To Identify Emerging Issues
- Redirect Extension Programs
- Redirect Research Programs
- In the Staff Hiring Process
- In the Action Plans
- To Set Priorities

Brief explanation.

Stakeholder input provides the foundation for the research and educational programs developed by MAES and MSUE. Stakeholders help decide the future direction for MAES through programs such as Project GREEEN, the Animal Agriculture Initiative, Families and Communities Together, commodity advisory teams and the Area of Expertise teams. Due to stakeholder input, MAES has focused more sharply on biobased products that can help boost the Michigan economy, including fuels, chemicals, neutraceuticals and food products; the environment, land use issues and biotechnology. Stakeholder input has changed the direction of youth programming to focus on job readiness and health, which have not been traditional program areas.

More specifically for FY 2009:

MSU Extension Restructuring: Town Hall meetings, individual meetings, feeback via e-mail, blogs and surveys and the upcoming AdvanceMichigan online needs identification are all being used to inform the restructuring framework, including identification of the four new institutes and the priorities that should be set under each of the institutes.

State of the State Survey: These results provide a step toward providing benchmarks for communities wishing to employ policies that encourage a shift in entrepreneurial culture. SOSS surveys will continue to be used to identify major issues and opportunities in Michigan to inform research priorities and programming.

Michigan Dairy Industry Survey: These findings are being used to update research and Extension priorities related to this important sector.

Horses Count in Michigan Survey -- MSU faculty members will use the results to inform educational programs, research and Extension efforts. The information will also help government officials make decisions and policies about zoning and land use, trail access, tax laws and other issues affecting equine owners. Veterinarians and others who monitor equine health will also find this information helpful.

Trends in Farmers Perspectives on MSU Extension - These findings are being used to guide research and Extension priorities especially related to the identification of strategies for optimum impact of MSU Extension programs and activities with increasingly limited resources.

V. Planned Program Table of Content

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Human Health, Environment, Family, Youth, Society and Community

2. Brief summary about Planned Program

Michigan's children are among the most inactive and sedentary in the nation. Many other health risks also face children, including poor diets, teenage smoking, unintended pregnancies, infectious diseases and lead poisoning. By high school graduation, more than 80 percent of all students have been harassed or bullied by classmates. Almost two of three Michigan residents are overweight or obese. Studies show that a lack of competitively priced fresh produce in urban grocery stores contributes to obesity, as does a lack of consistent, easy-to-understand information about nutrition. Food safety is a concern to Michigan residents, as is keeping themselves and their families safe. The past several years have been very difficult for the Michigan economy. The slumping auto industry has deeply affected the state's finances. Downturns in other manufacturing sectors and record-high gasoline prices have pushed the situation from bad to worse. To improve the health and safety of Michigan's adults, youth and communities, the Michigan Agricultural Experiment Station and MSU Extension have developed broad and comprehensive research and education programs to address specific Michigan needs. Youth development, community development, nutrition and food safety research and education, and family and parenting skills are focus areas that stakeholders have identified as important.

Programs in this area will:

Help Michigan residents eat healthier, become more active, be better caregivers, and prevent and manage chronic health conditions. Improve management of financial resources by individuals and families. Help prepare youth for life and work. Assist Michigan communities in making critical policy decisions and functioning more smoothly with citizen involvement.

3. Program existence : Mature (More then five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
702	Requirements and Function of Nutrients and Other Food Components	1%		10%	
703	Nutrition Education and Behavior	5%		3%	
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources	1%		2%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	1%		5%	
721	Insects and Other Pests Affecting Humans	1%		5%	
723	Hazards to Human Health and Safety	7%		12%	
724	Healthy Lifestyle	11%		15%	
801	Individual and Family Resource Management	13%		0%	
802	Human Development and Family Well-Being	12%		8%	
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	3%		10%	
805	Community Institutions, Health, and Social Services	5%		10%	
806	Youth Development	40%		20%	
	Total	100%		100%	

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

Health-care costs have skyrocketed. The number of overweight adolescents in the United States has tripled in 30 years. Overweight kids have a 70 to 80 percent chance of becoming overweight adults. More than 60 percent of Michigan residents are overweight. Physical inactivity and obesity are the leading health indicators targeted for intervention by the Centers for Disease Control. The effects of physical inactivity cost billions annually. More than 61 percent of youth don't participate in any organized physical activity outside school. Children involved in after-school programs are much less likely to be obese than nonparticipants. Eighth-graders who do not participate in supervised after-school activities double their risk of smoking, drinking and using drugs.

By the time a child is three, 85 percent of the brain is developed, but many children enter school unprepared to learn. Many parents and caregivers lack knowledge of developmentally appropriate practices, physical health and wellness, social competence, emotional well-being and cognitive development. Families lack family communication skills. Affordable, high-quality childcare supports business productivity and quality of life for families.

According to a report of the Governor's Commission on Higher Education and Economic Growth, many students are not prepared for life and work. In a recent State of the State survey, 80 percent of respondents identified youth job training as a high priority. Tenth graders who aren't involved in extracurricular activities are 57 percent more likely to drop out of school. Michigan's high-school graduation rate is only 74 percent.

Antibiotic resistance, bacterial pathogens, food allergies and viruses continue to be issues in food safety, especially *Listeria,Salmonella*, *E. coli* O157:H7 and *Campylobacter*. New solutions to time-temperature control in food are needed, as are new methods to detect pathogens quickly, accurately and efficiently.

Research by the Federal Reserve indicates that household debt is at a record high relative to disposable income. The average American family carries nearly $20,000 in credit debt. Bankruptcy rates have increased tenfold in five years. U.S. life

expectancies have risen, but many people are not prepared to successfully manage their finances in anticipation of retirement. Fewer than half of all minority and low-income families own their residence.

Many communities are not prepared for the health care, housing and transportation needs of seniors.

Leaders in urban centers look for help revitalizing struggling downtowns; government officials in municipalities of all sizes need assistance with economic development. In many communities, multicultural differences are not recognized, understood and appreciated. Citizens lack awareness of the level and funding of public services, the complexity of public issues and the methods of citizen involvement.

2. Scope of the Program

- In-State Extension
- In-State Research
- Multistate Research
- Multistate Extension
- Integrated Research and Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

Funding for these research projects and educational programs will remain constant or possibly decrease; therefore, some expertise will be lost. The methodology used to determine program direction is sound. People who are trained in nutrition and food safety will change their nutritionally unsound behavior and handle food safely. Reducing the number of overweight and obese adults and children in Michigan will reduce health-care costs and improve residents' quality of life. Given appropriate information and tools, people with chronic medical conditions will manage their condition effectively. Financial literacy training will result in better financial decisions. Training parents and caregivers will improve children's readiness to enter school. Improved parenting and family management skills will improve quality of life. Given accurate information, communities will act positively to meet the needs of seniors. Citizens and local officials who are trained will use the information learned to improve their communities. Helping Michigan communities of all sizes with economic development will provide improved quality of life, a more robust economy and a more attractive business climate for Michigan. Preparing youth for meaningful, well-paying careers will lead to better employment opportunities, which will improve their quality of life and boost the state's economy.

2. Ultimate goal(s) of this Program

To ensure that all Michigan residents have access to safe, healthful, affordable food.

Develop new tests to detect current and emerging food pathogens quickly, accurately and efficiently.

To give individuals, parents and caregivers the knowledge and tools to choose healthful food, physically active lifestyles and behaviors consistent with federal dietary guidelines to prevent obesity or deal with it in a positive way, practice safe food handling, and effectively manage chronic medical conditions.

Individuals will gain financial literacy, management and organizational skills, including credit, budgeting, savings and investing, homebuying, energy and affordable housing options. This will increase savings and reduce consumer debt.

To ensure that children enter school ready to learn by teaching parents and caregivers how to use developmentally appropriate practices to ensure their children's physical health and wellness, social competence, emotional well-being and cognitive development.

Family relationships will be strengthened.

To prepare communities to meet the health care, housing and transportation needs of seniors.

To prepare public officials to seek and hold office and gain knowledge about funding, the most efficient and effective ways to provide services, strategic planning, conflict management, communication, engaging the public in policy development, and intergovernmental cooperation. This will enable local public officials to be confident, efficient, effective leaders in their communities.

Michigan citizens will be knowledgeable, prepared and willing to serve in public roles and make good decisions.

To ensure that youth have the knowledge and skills needed for well-paying, fulfilling employment and to meet the challenges of a changing world, as well as enhanced physical, social, emotional and cognitive health and well-being.

To enhance the personal growth of youth through volunteering in community service.

To help guide public health recommendations for dietary intakes of specific micronutrients and bioactive food components to prevent the deveopment of allergic disorders, especially in the context of airway disease.

To evaluate the role of migrating waterfowl and shorebirds in the dispersal of pathogens that pose significant health threats to wild and domestic animals as well as humans.

To better understand community capacity in the management and decision making around natural resources, specifically water and sanitation.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2011	63.0	0.0	12.5	0.0
2012	62.0	0.0	12.5	0.0
2013	61.0	0.0	12.5	0.0
2014	60.0	0.0	12.5	0.0
2015	60.0	0.0	12.5	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Develop an understanding of how n-3 polyunsaturated fatty acids affect human health and disease, especially cardiovascular disease and inflammation.

Determine the relationships between obesity and family meals/lifestyle factors; family lifestyle factors/education and food choices and general health; and environmental influences and obesity/general health/physical activity.

Increase understanding about how environmental pollutants, especially ozone and endocrine disruptors affect human health.

Establish new programs and policies to help young people move successfully from foster care to independent living after they are too old for foster care.

Analyze the relationships among social support, public policy and family characteristics and how they affect the function and well-being of rural low-income families.

Increase understanding and develop more effective environmental management systems.

Develop better models for the human health and human services sectors.

Educational programs to:

Teach how to choose healthful food, physically active lifestyles and behaviors consistent with dietary guidelines. Teach consumers to keep their food safe by offering programs on food safety, home food preservation and healthy, hygienic food-handling practices. Teach people living with chronic medical conditions to manage their condition effectively. Teach financial literacy and prepare individuals to manage their finances in anticipation of retirement. Teach caregivers and parents how to prepare children for school. Increase access to affordable, high-quality childcare. Prepare communities for the health care, housing and transportation needs of seniors. Educate citizens and public officials about funding methods, service provision and intergovernmental cooperation. Provide counties and municipalities with technical assistance related to intergovernmental contracting, consolidating services and financial and strategic planning. Assist government officials in leadership, conflict management, communication and engaging the public in policy development. Prepare youth with knowledge and skills needed for life and employment. Enhance the physical, social, emotional and cognitive health and well-being of youth.

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
● Education Class ● Workshop ● Group Discussion	● Newsletters ● TV Media Programs ● Web sites ● Other 1 (News Releases) ● Other 2 (Annual Report/Magazine)

3. Description of targeted audience

Michigan private citizens, state agencies, farmers, food processors, commodity groups and agricultural industry representatives are targets of research programs. Individuals of all ages and life stages are targeted for healthy lifestyle and food-safety education programs. Human development and family well-being programs target parents and caregivers of preschool children, people living with chronic medical conditions and senior citizens. Community institutions, health and social services programs target citizens and public/government officials. Youth age 9 to 18 are targets of youth development programs.

V(G). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons(contacts) to be reached through direct and indirect contact methods

	Direct Contact Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
2011	3750	7550	4350	8700
2012	3750	7550	4350	8700
2013	3750	7550	4350	8700
2014	3750	7550	4350	8700
2015	3750	7550	4350	8700

2. (Standard Research Target) Number of Patent Applications Submitted

2011:1 **2012:**1 **2013:**1 **2014:**1 **2015:**1

3. Expected Peer Review Publications

Year	Research Target	Extension Target	Total
2011	35	1	36
2012	35	1	36
2013	35	2	37
2014	35	2	37

Year	Research Target	Extension Target	Total
2015	35	3	38

V(H). State Defined Outputs

1. Output Target

- Number of research programs on human health, environment, family, youth, society and community.

  2011:37 **2012:**37 **2013:**37 **2014:**37 **2015:**37

- Number of adult participants trained in healthy lifestyles.

  2011:1400 **2012:**1400 **2013:**1400 **2014:**1400 **2015:**1400

- Number of youth participants trained in healthy lifestyles.

  2011:2500 **2012:**2500 **2013:**2500 **2014:**2500 **2015:**2500

- Number of adult participants trained in human development and family well-being.

  2011:2500 **2012:**2500 **2013:**2500 **2014:**2500 **2015:**2500

- Number of youth participants trained in human development and family well-being.

  2011:2500 **2012:**2500 **2013:**2500 **2014:**2500 **2015:**2500

- Number of adult participants trained in youth development.

  2011:1500 **2012:**1500 **2013:**1500 **2014:**1500 **2015:**1500

- Number of youth participants trained in youth development.

  2011:2200 **2012:**2200 **2013:**2200 **2014:**2200 **2015:**2200

- Number of adult participants trained in family resource management.

  2011:100 **2012:**100 **2013:**100 **2014:**100 **2015:**100

V(I). State Defined Outcome

O. No.	Outcome Name
1	Number of research programs to determine the relationship between obesity and family meals/lifestyle factors/education,food choices and general health, and environmental influences/obesity/physical activity and general health.
2	Number of research programs to understand how environmental pollutants, especially ozone and endocrine disruptors, affect human health.
3	Number of research programs to analyze the relationships among social support, public policy and family characteristics and/or develop better models for the human health and human services sector.
4	Number of adult participants with increased knowledge about healthy lifestyles.
5	Number of youth participants with increased knowledge about healthy lifestyles.
6	Number of adult participants with increased knowledge of human development and family well-being.
7	Number of youth participants with increased knowledge of human development and family well-being.
8	Number of adult participants with increased knowledge of youth development.
9	Number of youth participants with increased knowledge of youth development.
10	Number of research programs to develop more effective environmental/natural resources management systems.
11	Number of adult participants with increased knowledge of family resource management.
12	Number of research programs that study the function of nutrients and other components related to human health.

Outcome # 1

1. Outcome Target

Number of research programs to determine the relationship between obesity and family meals/lifestyle factors/education,food choices and general health, and environmental influences/obesity/physical activity and general health.

2. Outcome Type : Change in Action Outcome Measure

2011:14	**2012:**14	**2013:**14	**2014:**14	**2015:**14

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior
- 724 - Healthy Lifestyle
- 802 - Human Development and Family Well-Being
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 2

1. Outcome Target

Number of research programs to understand how environmental pollutants, especially ozone and endocrine disruptors, affect human health.

2. Outcome Type : Change in Condition Outcome Measure

2011:5	**2012:**5	**2013:**5	**2014:**5	**2015:**5

3. Associated Knowledge Area(s)

- 723 - Hazards to Human Health and Safety
- 805 - Community Institutions, Health, and Social Services

4. Associated Institute Type(s)

- 1862 Research

Outcome # 3

1. Outcome Target

Number of research programs to analyze the relationships among social support, public policy and family characteristics and/or develop better models for the human health and human services sector.

2. Outcome Type : Change in Condition Outcome Measure

2011:10	**2012:**10	**2013:**10	**2014:**10	**2015:**10

3. Associated Knowledge Area(s)

- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities

- 805 - Community Institutions, Health, and Social Services
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 4

1. Outcome Target

Number of adult participants with increased knowledge about healthy lifestyles.

2. Outcome Type : Change in Knowledge Outcome Measure

2011:1100	**2012:**1100	**2013:**1100	**2014:**1100	**2015:**1100

3. Associated Knowledge Area(s)

- 724 - Healthy Lifestyle

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 5

1. Outcome Target

Number of youth participants with increased knowledge about healthy lifestyles.

2. Outcome Type : Change in Knowledge Outcome Measure

2011:2125	**2012:**2125	**2013:**2125	**2014:**2125	**2015:**2125

3. Associated Knowledge Area(s)

- 724 - Healthy Lifestyle
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 6

1. Outcome Target

Number of adult participants with increased knowledge of human development and family well-being.

2. Outcome Type : Change in Knowledge Outcome Measure

2011:1300	**2012:**1300	**2013:**1300	**2014:**1300	**2015:**1300

3. Associated Knowledge Area(s)

- 802 - Human Development and Family Well-Being

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 7

1. Outcome Target

Number of youth participants with increased knowledge of human development and family well-being.

2. Outcome Type : Change in Knowledge Outcome Measure

2011:2125	**2012:**2125	**2013:**2125	**2014:**2125	**2015:**2125

3. Associated Knowledge Area(s)

- 802 - Human Development and Family Well-Being
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 8

1. Outcome Target

Number of adult participants with increased knowledge of youth development.

2. Outcome Type : Change in Knowledge Outcome Measure

2011:1275	**2012:**1275	**2013:**1275	**2014:**1275	**2015:**1275

3. Associated Knowledge Area(s)

- 802 - Human Development and Family Well-Being
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 9

1. Outcome Target

Number of youth participants with increased knowledge of youth development.

2. Outcome Type : Change in Knowledge Outcome Measure

2011:1800	**2012:**1800	**2013:**1800	**2014:**1800	**2015:**1800

3. Associated Knowledge Area(s)

- 802 - Human Development and Family Well-Being
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 10

1. Outcome Target

Number of research programs to develop more effective environmental/natural resources management systems.

2. Outcome Type : Change in Knowledge Outcome Measure

2011:6	**2012:**6	**2013:**6	**2014:**6	**2015:**6

3. Associated Knowledge Area(s)

- 723 - Hazards to Human Health and Safety
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities

4. Associated Institute Type(s)

- 1862 Research

Outcome # 11

1. Outcome Target

Number of adult participants with increased knowledge of family resource management.

2. Outcome Type : Change in Knowledge Outcome Measure

2011:88	**2012:**88	**2013:**88	**2014:**88	**2015:**88

3. Associated Knowledge Area(s)

- 801 - Individual and Family Resource Management

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 12

1. Outcome Target

Number of research programs that study the function of nutrients and other components related to human health.

2. Outcome Type : Change in Condition Outcome Measure

2011:2	**2012:**2	**2013:**2	**2014:**2	**2015:**2

3. Associated Knowledge Area(s)

- 702 - Requirements and Function of Nutrients and Other Food Components
- 723 - Hazards to Human Health and Safety

4. Associated Institute Type(s)

- 1862 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Description

These programs are based on priorities set in the 2005-2006 issues identification process, as well as ongoing refinement and modification of these priorities and related programs moving forward. Public policy changes may affect priorities. Obesity, good nutrition and career-ready graduates are high priorities for Michigan's elected officials. If priorities change, funds may be reallocated among programs. If funding is reduced, programming will be reduced. A drastic change in population could necessitate a change in priorities to meet the needs of the target audiences. Public reactions to and perceptions of food safety and quality will influence the research and its outcomes.

V(K). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)
- Case Study
- Comparisons between program participants (individuals, group, organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- Comparison between locales where the program operates and sites without program intervention

Description

The research will be evaluated in a variety of ways. To determine whether knowledge/behavior has changed, we will query participants. To determine whether the environment/human health has improved, we will use

agreed-upon parameters to evaluate any benefits/risks. MSU Extension will use pre- and post-program surveys to determine the change in competency level of participants in educational programs.

2. Data Collection Methods

- Sampling
- Whole population
- On-Site
- Structured
- Unstructured
- Case Study
- Observation
- Tests
- Other (crowdsourcing)

Description

When collecting data, we will consider the relative merit of each method of data collection. The method we choose will be influenced by the type of information we desire to analyze, the time available and the cost. While there are many data we could collect about each project, we will choose those that provide the most useful information and are within our budget. Most important, we want to ensure that the data collected are credible, accurate and useful to our organizations.

V(A). Planned Program (Summary)

Program # 2

1. Name of the Planned Program

Soil, Water and Natural Resources

2. Brief summary about Planned Program

Michigan has more than 36 million acres of land with more than 10,000 inland lakes and 36,000 miles of streams. No place in Michigan is more than 85 miles from one of the Great Lakes. The state's land and water support the plants and animals that provide shelter, food and fiber. They provide minerals and other inorganic materials and are the final repository for all the state's waste. Agriculture and natural resources industries -- the two most economically important industries in Michigan after the automobile industry -- depend completely on the state's soil and water resources to remain viable.

To preserve, protect and enhance these resources, the Michigan Agricultural Experiment Station and MSU Extension have extensive research and education programs addressing specific Michigan needs. Soil conservation, waste management and use of waste products, ecosystem management, water research (quality, watershed management, and water use for agriculture and natural resources businesses) are all areas of focus that have been identified as important by stakeholders.

3. Program existence : Mature (More then five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
101	Appraisal of Soil Resources	1%		2%	
102	Soil, Plant, Water, Nutrient Relationships	19%		15%	
111	Conservation and Efficient Use of Water	12%		15%	
112	Watershed Protection and Management	15%		10%	
123	Management and Sustainability of Forest Resources	8%		7%	
131	Alternative Uses of Land	18%		10%	
132	Weather and Climate	1%		15%	
133	Pollution Prevention and Mitigation	12%		15%	
134	Outdoor Recreation	1%		0%	
135	Aquatic and Terrestrial Wildlife	5%		8%	
806	Youth Development	8%		3%	
	Total	100%		100%	

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

Michigan is a state defined, literally, by water. Without the Great Lakes, Michigan's peninsulas would not exist. Nor would much of the state's agriculture, manufacturing, shipping and tourism offerings. Water is necessary for life -- every human needs water to live, as do the plants and animals that provide food and shelter. Michigan has more households -- 1.12 million -- served by private wells than any other state.

At the same time, Michigan's land resources provide food, shelter and space and materials for the state's industries, as well as recreation.

Research and education are needed to:

Identify the trends, causes, and consequences of urban sprawl and to provide recommendations to state government to minimize the negative effects of current land use patterns on Michigan's environment and economy. Determine the best way to remove pollutants from soil and water and turn over these areas into safe, productive sites. Provide farmers with techniques to maintain the health and productivity of their soils. Offer growers a more thorough understanding of the relationships among crops, nutrients and water and how crops can be grown efficiently and productively with the fewest inputs possible. Understand how the warming trend in Michigan's climate will affect agricultural crops, weeds, insects and diseases. Determine how agriculture can hold carbon in the soil, which would help reduce the amount of carbon dioxide in the atmosphere, as well as how carbon markets may benefit Michigan farmers. Keep Michigan's surface and groundwater clean and make all citizens aware of why this is a critical issue. Ensure that a safe, secure and plentiful water supply is available for the state's citizens, industries, wildlife and natural areas. Develop tools and technology to help Michigan's natural resources-based tourism industry grow by meeting consumer demands. Determine how wildlife, fisheries, and natural resources areas respond to habitat management to encourage management for sustainable benefits.

These priorities have been identified as important by Michigan citizens, farmers, state government representatives, private industry and commodity groups.

2. Scope of the Program

- In-State Extension
- In-State Research
- Multistate Research
- Integrated Research and Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

Determining the causes of undesirable outcomes will lead to techniques to change the undesirable outcome into a desirable outcome.

Developing best practices to remove pollutants will lead to safe, healthy soil and water resources. Farmers depend on their land for their livelihoods. They want to ensure that it is sustainable and productive. All Michigan citizens should have access to clean land and water. Two of Michigan's top industries (agriculture and tourism) depend on the availability of clean land and water.

Farmers will adopt new production methods if the methods are proven to work and will enhance the farmers' profitability.

Sustainable forests, land and water benefit Michigan's economy and quality of life.

Funding will remain constant or decrease.

2. Ultimate goal(s) of this Program

Identify the trends, causes, and consequences of urban sprawl and provide recommendations to state government to minimize the negative effects of current land use patterns on Michigan's environment and economy.

Determine the best way to remove pollutants from soil and water and turn over these areas into safe, productive sites.

Provide farmers with techniques to maintain the health and productivity of their soils.

Offer growers a more thorough understanding of the relationships among crops, nutrients and water and how crops can be grown efficiently and productively with the fewest inputs possible.

Understand how the warming trend in Michigan's climate will affect agricultural crops, weeds, insects and diseases.

Determine how agriculture can hold carbon in the soil, which would help reduce the amount of carbon dioxide in the

atmosphere, as well as how carbon markets may benefit Michigan farmers.

Keep Michigan's surface and groundwater clean and make all citizens aware of why this is a critical issue.

Ensure that a safe, secure and plentiful water supply is available for the state's citizens, industries, wildlife and natural areas.

Develop tools and technology to help Michigan's natural resources-based tourism industry grow by meeting consumer demands.

Determine how wildlife, fisheries, and natural resources areas respond to habitat management to encourage management for sustainable benefits.

Foster positive resource management attitudes and stewardship actions.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2011	10.8	0.0	15.0	0.0
2012	10.8	0.0	15.0	0.0
2013	10.8	0.0	15.0	0.0
2014	10.8	0.0	16.0	0.0
2015	10.8	0.0	16.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Develop new land use models for Michigan communities. Offer education to planners, elected officials and citizens on how these new models will reduce sprawl and ensure that the desirable outcomes will become reality. Create new remediation strategies to clean up polluted soil and water. These strategies will be environmentally friendly, economically feasible and easy to implement with proper training. Discover new knowledge about the composition, organization and fluctuations of microbial populations in the soils. Develop a user-friendly computer program for nutrient management for Michigan crop and livestock producers to improve the management of fertilizer and manure nutrients on cropland to protect water resources and boost crop productivity. Develop greenhouse gas mitigation strategies Develop management techniques for potato and vegetable growers that includes cover crops. Develop new nitrogen application recommendations for turf managers. Develop a management system for Michigan inland lakes that does not involve sampling the lakes. Develop Total Maximum Daily Load (TMDL) assessment tools for evaluation of Michigan watersheds. Determine how wildlife responds to ecosystem management decisions in forest and agricultural systems. Quantify the benefits and costs of a sample green roof system installed on campus. Develop fish population/community computer models for species important to Michigan. These models will be used to evaluate different fishery management strategies. Develop web-based tools and models for natural resources managers so knowledge can be shared quickly and easily. Develop computer models to assess how habitat management affects species important to Michigan, including white-tailed deer, salmon, trout and perch. Promote and support value-added processing of forest products, including wood products, biofuels, maple syrup and other nontimber products. Identify, prevent and control exotic invasive pests and diseases of forests. Conduct educational programs to help farmers improve nutrient management and other practices to maintain and improve quality of groundwater and surface water. Conduct educational programs with riparians and lake users to enhance their understanding of watershed management and inland lakes water quality issues. Work with state agencies and local communities to encourage protection of community groundwater supplies through wellhead protection programs. Educate and train health officials, consultants, engineers and riparians to improve onsite and decentralized wastewater treatment and design.

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
● Education Class ● Workshop ● Group Discussion ● One-on-One Intervention ● Demonstrations	● Public Service Announcement ● Newsletters ● TV Media Programs ● Web sites ● Other 1 (News Releases) ● Other 2 (Annual Report/Magazine)

3. Description of targeted audience

Michigan farmers, natural resource managers, private citizens, agriculture and natural resources industry representatives, state agencies, riparians and foresters.

V(G). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons(contacts) to be reached through direct and indirect contact methods

	Direct Contact Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
2011	5250	10500	6700	0
2012	5250	10500	6700	0
2013	5250	10500	6700	0
2014	5250	10500	6700	0
2015	5250	10500	6700	0

2. (Standard Research Target) Number of Patent Applications Submitted

2011:4 **2012:**4 **2013:**4 **2014:**5 **2015:**5

3. Expected Peer Review Publications

Year	Research Target	Extension Target	Total
2011	54	1	55
2012	54	1	55
2013	54	2	56
2014	56	2	58
2015	56	2	58

V(H). State Defined Outputs

1. Output Target

- Number of research programs on soil, water and natural resources.

  2011:44 **2012:**44 **2013:**44 **2014:**46 **2015:**46

- Number of adult participants trained in soil, plant, water and nutrient relationships.

  2011:800 **2012:**800 **2013:**800 **2014:**800 **2015:**800

- Number of youth participants trained in soil, plant, water and nutrient relationships.

  2011:500 **2012:**500 **2013:**500 **2014:**500 **2015:**500

- Number of adult participants trained in watershed protection and management.

  2011:1000 **2012:**1000 **2013:**1000 **2014:**1000 **2015:**1000

- Number of youth participants trained in watershed protection and management.

  2011:2000 **2012:**2000 **2013:**2000 **2014:**2000 **2015:**2000

- Number of adult participants trained in management and sustainability of forest resources.

  2011:1000 **2012:**1000 **2013:**1000 **2014:**1000 **2015:**1000

- Number of youth participants trained in management and sustainability of forest resources.

  2011:400 **2012:**400 **2013:**400 **2014:**400 **2015:**400

- Number of adult participants trained in alternative uses of land.

  2011:1500 **2012:**1500 **2013:**1500 **2014:**1500 **2015:**1500

- Number of youth participants trained in alternative uses of land.

  2011:600 **2012:**600 **2013:**600 **2014:**600 **2015:**600

V(I). State Defined Outcome

O. No.	Outcome Name
1	Number of research programs to discover new knowledge about the composition, organization and fluctuations of microbial populations in the soils.
2	Number of adult participants with increased knowledge of watershed protection and management.
3	Number of youth participants with increased knowledge of watershed protection and management.
4	Number of adult participants with increased knowledge in management and sustainability of forest resources.
5	Number of research programs to determine how wildlife responds to ecosystem management decisions in natural resource and agricultural systems.
6	Number of youth participants with increased knowledge in management and sustainability of forest resources.
7	Number of adult participants with increased knowledge of alternative uses of land.
8	Number of adult participants with increased knowledge of soil, plant, water and nutrient relationships.
9	Number of youth participants with increased knowledge of alternative uses of land.
10	Number of youth participants with increased knowledge of soil, plant, water and nutrient relationships.
11	Number of research programs that deal with fish population dynamics and the management of Great Lakes fisheries.
12	Number of research programs that deal with the security, stewardship and management of Michigan's water resources.
13	Number of research programs that analyze key soil characteristics to better assess their agricultural and environmental contribution, including crop yield.
14	Number of research programs that explore the occurrence, transport and fate/effect of organic contaminants, chemicals, pesticides, pharmaceuticals and particulates in soils.
15	Number of research programs to develop new land use models for Michigan communities.

Outcome # 1

1. Outcome Target

Number of research programs to discover new knowledge about the composition, organization and fluctuations of microbial populations in the soils.

2. Outcome Type : Change in Condition Outcome Measure

2011:	**2012:**	**2013:**	**2014:**	**2015:**
8	8	8	8	8

3. Associated Knowledge Area(s)

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships

4. Associated Institute Type(s)

- 1862 Research

Outcome # 2

1. Outcome Target

Number of adult participants with increased knowledge of watershed protection and management.

2. Outcome Type : Change in Knowledge Outcome Measure

2011:	**2012:**	**2013:**	**2014:**	**2015:**
850	850	850	850	850

3. Associated Knowledge Area(s)

- 112 - Watershed Protection and Management

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 3

1. Outcome Target

Number of youth participants with increased knowledge of watershed protection and management.

2. Outcome Type : Change in Knowledge Outcome Measure

2011:	**2012:**	**2013:**	**2014:**	**2015:**
1700	1700	1700	1700	1700

3. Associated Knowledge Area(s)

- 112 - Watershed Protection and Management
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 4

1. Outcome Target

Number of adult participants with increased knowledge in management and sustainability of forest resources.

2. Outcome Type : Change in Knowledge Outcome Measure

2011:850	**2012:**850	**2013:**850	**2014:**850	**2015:**850

3. Associated Knowledge Area(s)

- 123 - Management and Sustainability of Forest Resources

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 5

1. Outcome Target

Number of research programs to determine how wildlife responds to ecosystem management decisions in natural resource and agricultural systems.

2. Outcome Type : Change in Condition Outcome Measure

2011:3	**2012:**3	**2013:**3	**2014:**3	**2015:**3

3. Associated Knowledge Area(s)

- 123 - Management and Sustainability of Forest Resources
- 135 - Aquatic and Terrestrial Wildlife

4. Associated Institute Type(s)

- 1862 Research

Outcome # 6

1. Outcome Target

Number of youth participants with increased knowledge in management and sustainability of forest resources.

2. Outcome Type : Change in Knowledge Outcome Measure

2011:340	**2012:**340	**2013:**340	**2014:**340	**2015:**340

3. Associated Knowledge Area(s)

- 123 - Management and Sustainability of Forest Resources
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 7

1. Outcome Target

Number of adult participants with increased knowledge of alternative uses of land.

2. Outcome Type : Change in Knowledge Outcome Measure

2011:1275	**2012:**1275	**2013:**1275	**2014:**1275	**2015:**1275

3. Associated Knowledge Area(s)

- 131 - Alternative Uses of Land

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 8

1. Outcome Target

Number of adult participants with increased knowledge of soil, plant, water and nutrient relationships.

2. Outcome Type : Change in Knowledge Outcome Measure

2011:600	**2012:**600	**2013:**600	**2014:**600	**2015:**600

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 9

1. Outcome Target

Number of youth participants with increased knowledge of alternative uses of land.

2. Outcome Type : Change in Knowledge Outcome Measure

2011:500	**2012:**500	**2013:**500	**2014:**500	**2015:**500

3. Associated Knowledge Area(s)

- 131 - Alternative Uses of Land
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 10

1. Outcome Target

Number of youth participants with increased knowledge of soil, plant, water and nutrient relationships.

2. Outcome Type : Change in Knowledge Outcome Measure

2011:400	**2012:**400	**2013:**400	**2014:**400	**2015:**400

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 11

1. Outcome Target

Number of research programs that deal with fish population dynamics and the management of Great Lakes fisheries.

2. Outcome Type : Change in Action Outcome Measure

2011:6	**2012:**6	**2013:**6	**2014:**6	**2015:**6

3. Associated Knowledge Area(s)

- 112 - Watershed Protection and Management
- 134 - Outdoor Recreation
- 135 - Aquatic and Terrestrial Wildlife

4. Associated Institute Type(s)

- 1862 Research

Outcome # 12

1. Outcome Target

Number of research programs that deal with the security, stewardship and management of Michigan's water resources.

2. Outcome Type : Change in Action Outcome Measure

2011:9	**2012:**9	**2013:**9	**2014:**10	**2015:**10

3. Associated Knowledge Area(s)

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 133 - Pollution Prevention and Mitigation

4. Associated Institute Type(s)

- 1862 Research

Outcome # 13

1. Outcome Target

Number of research programs that analyze key soil characteristics to better assess their agricultural and environmental contribution, including crop yield.

2. Outcome Type : Change in Knowledge Outcome Measure

2011:6	**2012:**6	**2013:**6	**2014:**7	**2015:**7

3. Associated Knowledge Area(s)

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 133 - Pollution Prevention and Mitigation

4. Associated Institute Type(s)

- 1862 Research

Outcome # 14

1. Outcome Target

Number of research programs that explore the occurrence, transport and fate/effect of organic contaminants, chemicals, pesticides, pharmaceuticals and particulates in soils.

2. Outcome Type : Change in Knowledge Outcome Measure

2011:6	**2012:**6	**2013:**6	**2014:**6	**2015:**6

3. Associated Knowledge Area(s)

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 132 - Weather and Climate
- 133 - Pollution Prevention and Mitigation

4. Associated Institute Type(s)

- 1862 Research

Outcome # 15

1. Outcome Target

Number of research programs to develop new land use models for Michigan communities.

2. Outcome Type : Change in Action Outcome Measure

2011:6	**2012:**6	**2013:**6	**2014:**6	**2015:**6

3. Associated Knowledge Area(s)

- 131 - Alternative Uses of Land
- 132 - Weather and Climate

4. Associated Institute Type(s)

- 1862 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Description

Michigan's soil, water and other natural resources are all in a delicate balance. If one part of the equation changes, through a new public policy change or a drought, it will affect all the other natural resources in the state.

V(K). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Case Study
- Comparisons between program participants (individuals, group, organizations) and non-participants
- Comparison between locales where the program operates and sites without program intervention

Description

The research and education will be evaluated in a variety of ways. To determine whether knowledge/behavior has changed, we will query participants. To determine if the environment/natural resources management has improved, we will use agreed upon parameters to evaluate any benefits/risks.

2. Data Collection Methods

- Sampling
- Whole population
- Mail

- Telephone
- On-Site
- Structured
- Unstructured
- Case Study
- Observation
- Portfolio Reviews
- Tests
- Journals

Description

When collecting data, we will consider the relative merit of each method of data collection. The method we choose will be influenced by the type of information we desire to analyze, the time available, and cost. While there are many data we could collect about each project, we will choose those that provide the most useful information and are within our budget. Most importantly, we want to ensure that the data collected are credible, accurate and useful to our organizations.

V(A). Planned Program (Summary)

Program # 3

1. Name of the Planned Program

Plant Sciences

2. Brief summary about Planned Program

Michigan produces over 200 commodities, making the state second only to California in terms of crop diversity. Michigan growers continue to need new varieties, cultural techniques and pest management strategies whether they are growing corn, apples, cherries, blueberries, turfgrass, petunias, or ornamental crabapple trees.

Michigan is one of the country's top producers of specialty crops. Because the acreage of these crops is lesser than that of corn, wheat, rice and soybeans, it isn't economically attractive for chemical companies to make developing pesticides for them a priority. So the state's growers of these smaller-acreage commodities look to the Michigan Agricultural Experiment Station and MSU Extension to provide the research and education on pesticides and management techniques.

Since 1915, Michigan State University plant breeders have released more than 300 varieties of plants, from corn, wheat and alfalfa to zinnias, strawberries and spruce trees. Each breeder works closely with Michigan growers to improve the desirable traits in each crop while keeping yields high. At the same time, MAES researchers and MSUE educators work continuously with growers to develop and test new management techniques to provide protection from insects, weeds, diseases and undesirable weather. As the demand for organic food increases, researchers and educators work to provide producers with cultural and pest management techniques that meet USDA organic standards.

Michigan State University Extension proposes to create a new Federally-Recognized Tribes Extension Program (FRTEP) servicing four federally-recognized tribes in the Eastern Upper Peninsula and Northern Lower Peninsula of Michigan. The proposed program will represent the first FRTEP servicing any tribal government in the Northeastern United States. The tribes partnering on the project are the Bay Mills Indian Community, the Hannahville Indian Community, the Little Traverse Bay Bands of Odawa Indians and the Sault Ste. Marie Tribe of Chippewa Indians. The project seeks to improve the health, well-being, energy independence and financial independence of these four Michigan Indian tribes through the creation of two full-time Extension Educator positions that will assist the tribes in advancing their agricultural and renewable resource programs. Agricultural and horticultural program activities will focus on enhancing the production and profitability of small-scale tribal agriculture projects and improving tribal member wellness. Renewable resource and sustainable development program activities will use educational processes to facilitate the incorporation of renewable energies into tribal households, tribal governmental offices and tribal businesses and increase tribal capacity to develop forest and agricultural-based renewable resources in ecologically and economically sustainable ways.

3. Program existence : Mature (More then five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
201	Plant Genome, Genetics, and Genetic Mechanisms	5%		16%	
202	Plant Genetic Resources	6%		5%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	7%		7%	
204	Plant Product Quality and Utility (Preharvest)	5%		5%	
205	Plant Management Systems	30%		17%	
206	Basic Plant Biology	3%		10%	
211	Insects, Mites, and Other Arthropods Affecting Plants	3%		12%	
212	Pathogens and Nematodes Affecting Plants	15%		12%	
215	Biological Control of Pests Affecting Plants	3%		5%	
216	Integrated Pest Management Systems	20%		11%	
806	Youth Development	3%		0%	
	Total	100%		100%	

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

Michigan growers continue to need new varieties, cultural techniques and pest management strategies to remain competitive and thrive in a global economy. MAES scientists and MSUE educators aim to meet the following priorities:

Develop new varieties that meet Michigan growers' needs (this includes fruit, vegetable, forestry, horticulture and field crop varieties). Identify and isolate novel genes, markers and genetic pathways that can benefit crops important to Michigan agriculture through higher yields, improved quality, better insect and disease resistance and greater tolerance to environmental stresses. Identify and isolate novel genes, enzymes and other phytochemicals that may benefit human health and determine how these beneficial compounds can be made available to people. Develop new nutrient management strategies for crops that improve yield and quality, while minimizing environmental effects, such as leaching and run-off. Develop cultural, management and insect and disease control strategies for crops that meet USDA certified organic standards so Michigan growers can take advantage of this growing market, if they choose to do so. Develop biological controls for pest insects and diseases to minimize effects on the environment. Develop integrated management systems for Michigan crops that recognize that what is done in one area, say control aphids on soybeans, has an affect on the whole farm environment, including soil, air, water, and beneficial insects and microbes. Evaluate new crop varieties and make the results widely available so growers have the most up-to-date information before planting. Develop a deeper understanding of the role specific genes and mutations play in crop quality, insect and disease resistance and environmental stress tolerance. Determine whether genes that impart desirable characteristics can safely and efficiently be incorporated into other species. Programs for underserved ethnic and racial groups - IPM scouts for Hispanic farmers & farm workers. Build tribal capacity in the area of small scale sustainable agriculture.

These priorities have been identified as important by Michigan citizens, farmers, state government representatives, private industry and commodity groups.

2. Scope of the Program

- In-State Extension

- In-State Research
- Multistate Research
- Integrated Research and Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

New varieties will keep Michigan growers competitive and thriving in a global agricultural economy. New varieties also will help provide an adequate, safe food supply for the people of Michigan. Developing a deeper understanding of the genetic and metabolic processes in plants will allow the creation of higher-yielding, higher-quality plants with improved resistance to pests, diseases and environmental stress. Unlocking the genetic secrets of plants also will allow scientists to identify and isolate plant compounds that may benefit human health; new techniques to manufacture and dispense these beneficial compounds and vaccines may result. Integrated management and cultural practices will ensure that agriculture is sustainable and productive because fertile soil, water and air will continue to be available to support it. Integrated management strategies also ensure that the environment will be a safe and secure place to support human, animal and plant life. Funding will remain constant or decrease.

2. Ultimate goal(s) of this Program

Develop improved varieties of dry beans, tart and sweet cherries, potatoes, wheat, rice, soybeans, oats, barley, canola, turfgrass, apples, strawberries, blueberries, floriculture crops, chestnuts, vegetable crops, and conifers for Michigan growers. Continue to identify genes and genetic pathways that control plant response to environmental stresses and develop techniques to insert these pathways into at-risk plants. Identify and isolate novel genes, markers and genetic pathways that can benefit crops important to Michigan agriculture through higher yields, improved quality, and better insect and disease resistance. Identify and isolate novel genes, enzymes and other phytochemicals that may have benefits for human health and determine how these beneficial compounds can be made available to people. Develop integrated management strategies and educational programs for fruit, field, vegetable, floriculture, Christmas tree and forestry crops that maximize the efficiency of resource inputs and improve yield and quality, while minimizing environmental effects, such as leaching and run-off. Develop cultural, management and insect and disease control strategies for crops that meet USDA certified organic standards so Michigan growers can take advantage of this growing market, if they choose to do so. Continue to develop biological controls for pest insects and diseases to minimize any effects on the environment. Continue variety trials for crops important to Michigan, including wheat, corn, soybeans and forages. Provide green industry professionals and homeowners with scientifically sound information to enable them to safely and effectively manage their turf, landscapes and gardens, improving efficiency of resources and controlling pests, while reducing pesticide and fertilizer use.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2011	32.4	0.0	29.0	0.0
2012	32.4	0.0	29.0	0.0
2013	32.4	0.0	29.0	0.0
2014	32.4	0.0	29.0	0.0
2015	32.4	0.0	29.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Develop improved varieties of dry beans, tart and sweet cherries, potatoes, wheat, rice, soybeans, oats, barley, canola, turfgrass, apples, strawberries, blueberries, floriculture crops, chestnuts, vegetable crops, and conifers for Michigan growers. Continue to identify genes and genetic pathways that control plant response to environmental stresses and develop techniques to insert these pathways into at-risk plants. Identify and isolate novel genes, markers and genetic pathways that can benefit crops important to Michigan agriculture through higher yields, improved quality, and better insect and disease resistance. Identify and isolate novel genes, enzymes and other phytochemicals that may have benefits for human health and determine how these beneficial compounds can be made available to people. Develop integrated management strategies and provide education programs for producers of fruit, field, vegetable, floriculture, Christmas tree and forestry crops that use the lowest possible inputs of resources and improve yield and quality, while minimizing environmental effects, such as leaching and run-off. Develop cultural, management and insect and disease control strategies for crops that meet USDA certified organic standards so Michigan growers can take advantage of this growing market, if they choose to do so. Continue to develop biological controls for pest insects and diseases to minimize effects on the environment. Continue variety trials for crops important to Michigan, including wheat, corn, soybeans and forages. Conduct educational programs to help farm producers control weeds and more effectively manage high-cost fertilizer inputs while optimizing crop production. Develop plant disease prediction models. Conduct educational programs to help plant producers control disease caused by pathogens and nematodes and teach integrated pest management methods. Provide green industry professionals and homeowners with scientifically sound information to enable them to safely and effectively manage their turf, landscapes and gardens, improving efficiency of resources and controlling pests, while reducing pesticide and fertilizer use. Train native american adults in sustainable agriculture.

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
● Education Class	● Newsletters
● Workshop	● TV Media Programs
● Group Discussion	● Web sites
● One-on-One Intervention	● Other 1 (News Releases)
● Demonstrations	● Other 2 (Annual Report/Publications)

3. Description of targeted audience

Michigan growers, private citizens, agriculture and natural resources industry representatives, biotechnology company representatives, and state agencies, andNative american growers.

V(G). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons(contacts) to be reached through direct and indirect contact methods

	Direct Contact Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
2011	7000	14000	5000	0
2012	7000	14000	5000	0
2013	7000	14000	5000	0
2014	7000	14000	5000	0
2015	7000	14000	5000	0

2. (Standard Research Target) Number of Patent Applications Submitted

2011:35 **2012:**35 **2013:**35 **2014:**35 **2015:**35

3. Expected Peer Review Publications

Year	Research Target	Extension Target	Total
2011	110	1	111
2012	110	1	111
2013	110	2	112
2014	110	2	112
2015	110	2	112

V(H). State Defined Outputs

1. Output Target

- Number of research projects on plant sciences.

  2011:82 **2012:**82 **2013:**82 **2014:**82 **2015:**82

- Number of adult participants trained in plant management systems.

  2011:5000 **2012:**5000 **2013:**5000 **2014:**5000 **2015:**5000

- Number of youth participants trained in plant management systems.

  2011:5000 **2012:**5000 **2013:**5000 **2014:**5000 **2015:**5000

- Number of adult participants trained in pathogens and nematodes affecting plants.

  2011:1000 **2012:**1000 **2013:**1000 **2014:**1000 **2015:**1000

- Number of adult participants trained in integrated pest management (IPM).

  2011:1500 **2012:**1500 **2013:**1500 **2014:**1500 **2015:**1500

V(I). State Defined Outcome

O. No.	Outcome Name
1	Number of youth participants with increased knowledge of plant management systems.
2	Number of adult participants with increased knowledge of pathogens and nematodes affecting plants.
3	Number of adult participants with increased knowledge of integrated pest management (IPM).
4	Number of research programs to develop insect and disease control and/or cultural and management strategies for organic crops.
5	Number of research programs to develop biological controls for pest insects and diseases to minimize any effects on the environment.
6	Number of research programs to develop integrated management strategies for fruit, field, vegetable, floriculture and forestry crops that use the lowest amounts of nutrients possible and improve yield and quality.
7	Number of research programs to identify and isolate novel genes, markers and genetic pathways that can benefit crops important to Michigan agriculture through higher yields, improved quality, and better insect and disease resistance.
8	Number of research programs to identify genes and genetic pathways that control plant response to environmental stresses and develop techniques to insert these pathways into at-risk plants.
9	Number of research programs to develop improved varieties of economically important crops for Michigan and the region.
10	Number of adult participants with increased knowledge of plant management systems.
11	Number of research programs to develop weed control methodologies, protocols and practices.
12	Number of research programs to develop controls for pathogens and nematodes affecting plants.
13	Number of research programs to develop production protocols and environmental and cultural strategies for the floriculture/nursery industry.
14	Number of research programs to develop more effective post-harvest protocols and practices to minimize loss and enhance quality.

Outcome # 1

1. Outcome Target

Number of youth participants with increased knowledge of plant management systems.

2. Outcome Type : Change in Knowledge Outcome Measure

2011:4250	**2012:**4250	**2013:**4250	**2014:**4250	**2015:**4250

3. Associated Knowledge Area(s)

- 205 - Plant Management Systems
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 2

1. Outcome Target

Number of adult participants with increased knowledge of pathogens and nematodes affecting plants.

2. Outcome Type : Change in Knowledge Outcome Measure

2011:850	**2012:**850	**2013:**850	**2014:**850	**2015:**850

3. Associated Knowledge Area(s)

- 205 - Plant Management Systems
- 212 - Pathogens and Nematodes Affecting Plants

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 3

1. Outcome Target

Number of adult participants with increased knowledge of integrated pest management (IPM).

2. Outcome Type : Change in Knowledge Outcome Measure

2011:1275	**2012:**1275	**2013:**1275	**2014:**1275	**2015:**1275

3. Associated Knowledge Area(s)

- 205 - Plant Management Systems
- 216 - Integrated Pest Management Systems

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 4

1. Outcome Target

Number of research programs to develop insect and disease control and/or cultural and management strategies for organic crops.

2. Outcome Type : Change in Condition Outcome Measure

2011:2	**2012:**2	**2013:**2	**2014:**2	**2015:**2

3. Associated Knowledge Area(s)

- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 215 - Biological Control of Pests Affecting Plants
- 216 - Integrated Pest Management Systems

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 5

1. Outcome Target

Number of research programs to develop biological controls for pest insects and diseases to minimize any effects on the environment.

2. Outcome Type : Change in Condition Outcome Measure

2011:7	**2012:**7	**2013:**7	**2014:**7	**2015:**7

3. Associated Knowledge Area(s)

- 205 - Plant Management Systems
- 212 - Pathogens and Nematodes Affecting Plants
- 215 - Biological Control of Pests Affecting Plants
- 216 - Integrated Pest Management Systems

4. Associated Institute Type(s)

- 1862 Research

Outcome # 6

1. Outcome Target

Number of research programs to develop integrated management strategies for fruit, field, vegetable, floriculture and forestry crops that use the lowest amounts of nutrients possible and improve yield and quality.

2. Outcome Type : Change in Condition Outcome Measure

2011:5	**2012:**5	**2013:**5	**2014:**5	**2015:**5

3. Associated Knowledge Area(s)

- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 206 - Basic Plant Biology

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 7

1. Outcome Target

Number of research programs to identify and isolate novel genes, markers and genetic pathways that can benefit crops important to Michigan agriculture through higher yields, improved quality, and better insect and disease resistance.

2. Outcome Type : Change in Condition Outcome Measure

2011:22	**2012:**22	**2013:**22	**2014:**22	**2015:**22

3. Associated Knowledge Area(s)

- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 202 - Plant Genetic Resources
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 205 - Plant Management Systems
- 206 - Basic Plant Biology

4. Associated Institute Type(s)

- 1862 Research

Outcome # 8

1. Outcome Target

Number of research programs to identify genes and genetic pathways that control plant response to environmental stresses and develop techniques to insert these pathways into at-risk plants.

2. Outcome Type : Change in Condition Outcome Measure

2011:6	**2012:**6	**2013:**6	**2014:**6	**2015:**6

3. Associated Knowledge Area(s)

- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 202 - Plant Genetic Resources
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants

- 206 - Basic Plant Biology
- 216 - Integrated Pest Management Systems

4. Associated Institute Type(s)

- 1862 Research

Outcome # 9

1. Outcome Target

Number of research programs to develop improved varieties of economically important crops for Michigan and the region.

2. Outcome Type : Change in Condition Outcome Measure

2011:18	**2012:**18	**2013:**18	**2014:**18	**2015:**18

3. Associated Knowledge Area(s)

- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 202 - Plant Genetic Resources
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 206 - Basic Plant Biology

4. Associated Institute Type(s)

- 1862 Research

Outcome # 10

1. Outcome Target

Number of adult participants with increased knowledge of plant management systems.

2. Outcome Type : Change in Knowledge Outcome Measure

2011:4275	**2012:**4275	**2013:**4275	**2014:**4275	**2015:**4275

3. Associated Knowledge Area(s)

- 205 - Plant Management Systems

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 11

1. Outcome Target

Number of research programs to develop weed control methodologies, protocols and practices.

2. Outcome Type : Change in Action Outcome Measure

2011:6	**2012:**6	**2013:**6	**2014:**6	**2015:**6

3. Associated Knowledge Area(s)

- 205 - Plant Management Systems
- 216 - Integrated Pest Management Systems

4. Associated Institute Type(s)

- 1862 Research

Outcome # 12

1. Outcome Target

Number of research programs to develop controls for pathogens and nematodes affecting plants.

2. Outcome Type : Change in Action Outcome Measure

2011:6	**2012:**6	**2013:**6	**2014:**6	**2015:**6

3. Associated Knowledge Area(s)

- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 212 - Pathogens and Nematodes Affecting Plants
- 215 - Biological Control of Pests Affecting Plants
- 216 - Integrated Pest Management Systems

4. Associated Institute Type(s)

- 1862 Research

Outcome # 13

1. Outcome Target

Number of research programs to develop production protocols and environmental and cultural strategies for the floriculture/nursery industry.

2. Outcome Type : Change in Action Outcome Measure

2011:7	**2012:**7	**2013:**7	**2014:**7	**2015:**7

3. Associated Knowledge Area(s)

- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems

4. Associated Institute Type(s)

- 1862 Research

Outcome # 14

1. Outcome Target

Number of research programs to develop more effective post-harvest protocols and practices to minimize loss and enhance quality.

2. Outcome Type : Change in Action Outcome Measure

2011:3	**2012:**3	**2013:**3	**2014:**3	**2015:**3

3. Associated Knowledge Area(s)

- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 215 - Biological Control of Pests Affecting Plants
- 216 - Integrated Pest Management Systems

4. Associated Institute Type(s)

- 1862 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Description

Public reaction to biotechnology affects the breeding and plant genetic work of MAES scientists. In order to meet grower demands and satisfy the public's demand for safe food, breeders must use a variety of technologies. Also, weather plays a large role in the prevalence of weeds, pest insects and diseases. New priorities may emerge as the environment changes.

V(K). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- Case Study
- Comparisons between program participants (individuals, group, organizations) and non-participants
- Comparison between locales where the program operates and sites without program intervention

Description

The research and education will be evaluated in a variety of ways. To determine whether knowledge/behavior has changed, we will query participants. To determine if new management strategies have benefited growers and the environment, we will survey growers as well as independently sample environmental parameters. New varieties will be evaluated by yield, pest and environmental stress resistance and grower adoption.

2. Data Collection Methods

- Sampling
- Whole population
- Mail
- On-Site
- Structured
- Unstructured
- Case Study
- Observation
- Portfolio Reviews
- Tests
- Journals

Description

When collecting data, we will consider the relative merit of each method of data collection. The method we choose will be influenced by the type of information we desire to analyze, the time available, and cost. While there are many data we could collect about each project, we will choose those that provide the most useful information and are within our budget. Most important, we want to ensure that the data collected are credible, accurate and useful to our organizations.

V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

Food and Non-Food Quality, Nutrition, Engineering and Processing

2. Brief summary about Planned Program

MSU expertise in biosystems engineering, food processing and nutritional immunology is paving the way for the creation of new products that offer Michigan residents food choices with greater health benefits. Engineering and processing advances will lead to greater cost efficiencies and enhanced food safety and security.

Michigan State University Extension proposes to create a new Federally-Recognized Tribes Extension Program (FRTEP) servicing four federally-recognized tribes in the Eastern Upper Peninsula and Northern Lower Peninsula of Michigan. The proposed program will represent the first FRTEP servicing any tribal government in the Northeastern United States. The tribes partnering on the project are the Bay Mills Indian Community, the Hannahville Indian Community, the Little Traverse Bay Bands of Odawa Indians and the Sault Ste. Marie Tribe of Chippewa Indians. The project seeks to improve the health, well-being, energy independence and financial independence of these four Michigan Indian tribes through the creation of two full-time Extension Educator positions that will assist the tribes in advancing their agricultural and renewable resource programs. Agricultural and horticultural program activities will focus on enhancing the production and profitability of small-scale tribal agriculture projects and improving tribal member wellness. Renewable resource and sustainable development program activities will use educational processes to facilitate the incorporation of renewable energies into tribal households, tribal governmental offices and tribal businesses and increase tribal capacity to develop forest and agricultural-based renewable resources in ecologically and economically sustainable ways.

3. Program existence : Mature (More then five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
401	Structures, Facilities, and General Purpose Farm Supplies	1%		3%	
402	Engineering Systems and Equipment	1%		6%	
403	Waste Disposal, Recycling, and Reuse	16%		14%	
404	Instrumentation and Control Systems	1%		9%	
501	New and Improved Food Processing Technologies	5%		14%	
502	New and Improved Food Products	5%		15%	
503	Quality Maintenance in Storing and Marketing Food Products	5%		18%	
511	New and Improved Non-Food Products and Processes	65%		16%	
512	Quality Maintenance in Storing and Marketing Non-Food Products	1%		5%	
	Total	100%		100%	

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

Agriculture is one of Michigan's top industries and the only growing sector in the state's economy. The state's agricultural/food system -- including leather, food, floriculture/ornamentals/turfgrass and biomass energy industries -- accounts for $71.3 billion in total economic activity (direct and indirect) and more than 1 million jobs. Agriculture generates more than $42.6 billion in direct economic activity. In total, the agricultural/food system employs nearly a quarter of all people working in Michigan. The system is likely second only to the auto industry in importance to the state's economy.

Michigan also has one of the most diverse agricultural industries in the United States. The state is second only to California in variety of crops grown. From field crops such as corn, wheat and soybeans to fruits such as cherries, apples, grapes and blueberries; to horticultural crops such as ornamental trees and flowering plants; and livestock, honey and fish, Michigan grows just about anything one can think of except citrus. It's no secret that the past several years have been very difficult for the Michigan economy. The slumping auto industry has deeply affected the state's finances, and downturns in other manufacturing sectors and record-high gasoline prices have pushed the situation from bad to worse. Researchers and educators from all disciplines are pondering how to reverse the state's economic decline. One solution is to build a new biobased economic sector on the existing foundation of agriculture, forestry and natural resources, and industrial and manufacturing sectors. The result will be the advancement of a new, sustainable biobased sector that provides a competitive advantage in meeting the growing global demand for renewable sources of materials, chemicals and energy in products, processes and packaging, as well as traditional food products and functional foods.

Priorities are to:

Connect Michigan industries with the research, education and entrepreneurial activity needed in the basic sciences, engineering, plant science and agriculture to provide the state with a foundation for vigorous development of a new biobased economic sector.

Identify and isolate beneficial plant compounds that can be used to make new functional foods.

Develop the processes and technologies to manufacture functional foods.

Develop new biosensors and DNA chips that can rapidly and accurately detect a broad spectrum of harmful organisms in food and water, such as *E. coli*, *Salmonella*, *Listeria*, *Campylobacter, Cryptosporidium* and *Giardia*.

Identify breeding and genetic improvement related to food quality, nutrition and processing.

Develop packaging systems to enhance food quality and shelf life.

Build tribal capacity in the area sustainable utilization of renewable resources.

2. Scope of the Program

- In-State Extension
- In-State Research
- Multistate Research
- Multistate Extension
- Integrated Research and Extension
- Multistate Integrated Research and Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

Preliminary technology, processes and protocols are available to accomplish many of the priorities, however, they need to become more cost effective and efficient in order to ensure industry sustainability, environmental

stewardship and human health. Funding will remain constant or increase.

2. Ultimate goal(s) of this Program

To support and build on Michigan's economic sector using the existing foundation of agriculture, forestry and natural resources, and industrial and manufacturing sectors. This will advance enhanced, sustainable sectors that provide a competitive advantage in meeting the growing global demand for renewable sources of materials, chemicals and energy in products, processes and packaging, as well as new food products and functional foods that are both safe and nutritious.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2011	1.0	0.0	8.5	0.0
2012	1.0	0.0	8.5	0.0
2013	1.0	0.0	8.5	0.0
2014	1.0	0.0	8.5	0.0
2015	1.0	0.0	8.5	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Connect Michigan industries with the research, education and entrepreneurial activity needed in the basic sciences, engineering, plant science and agriculture to provide the state with a foundation for vigorous development of a new biobased economic sector. Identify and isolate beneficial plant compounds that can be used to make new functional foods. Develop the processes and technologies to manufacture functional foods. Develop new biosensors and DNA chips that can rapidly and accurately detect a broad spectrum of harmful organisms in food and water, such as *E. coli*, *Salmonella,Listeria*, *Campylobacter*, *Cryptosporidium* and *Giardia*. Identify breeding and genetic improvements related to food quality, nutrition and processing. Develop packaging systems to enhance food quality and shelf life. Train native american adults on energy crops and renewable resources.

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
● Workshop ● Group Discussion ● Demonstrations	● Newsletters ● Web sites ● Other 1 (News Releases) ● Other 2 (Annual Report/Magazine)

3. Description of targeted audience

Agriculture and natural resources industry representatives, biotechnology company representatives, state agency representatives, private citizens, entrepreneurs.Native American growers.

V(G). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons(contacts) to be reached through direct and indirect contact methods

	Direct Contact Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
2011	30	50	0	0
2012	30	50	0	0
2013	60	100	0	0
2014	60	100	0	0
2015	60	100	0	0

2. (Standard Research Target) Number of Patent Applications Submitted

2011:12 **2012:**12 **2013:**12 **2014:**12 **2015:**12

3. Expected Peer Review Publications

Year	Research Target	Extension Target	Total
2011	30	0	30
2012	30	0	30
2013	30	0	30
2014	30	0	30
2015	30	0	30

V(H). State Defined Outputs

1. Output Target

- Number of research projects focusing on food quality, nutrition, engineering and processing.

2011:25 **2012:**25 **2013:**25 **2014:**25 **2015:**25

- Number of adults trained on new and improved non-food and bioeconomy related products and processes.

2011:30 **2012:**30 **2013:**30 **2014:**30 **2015:**30

V(I). State Defined Outcome

O. No.	Outcome Name
1	Number of research programs to identify and isolate plant compounds and/or develop the processes and technologies to manufacture functional foods.
2	Number of research programs to develop new biosensors and DNA chips that can rapidly and accurately detect a broad spectrum of harmful organisms in food and water, such as E. coli, Salmonella, Listeria, Campylobacter, Cryptosporidium and
3	Number of adults with new and improved knowledge on non-food and bioeconomy related products and processes.
4	Number of research programs to identify breeding and genetic improvement related to food quality, nutrition and processing.
5	Number of research programs to develop packaging systems to enhance food quality and shelf life.
6	Number of research programs to connect Michigan industries with research, education and entrepreneurial activity needed in the basic sciences, engineering and plant science and agriculture to provide the state with a foundation for vigorous development of a new biobased economic sector.

Outcome # 1

1. Outcome Target

Number of research programs to identify and isolate plant compounds and/or develop the processes and technologies to manufacture functional foods.

2. Outcome Type : Change in Action Outcome Measure

2011:8	**2012:**8	**2013:**8	**2014:**8	**2015:**8

3. Associated Knowledge Area(s)

- 501 - New and Improved Food Processing Technologies
- 502 - New and Improved Food Products
- 503 - Quality Maintenance in Storing and Marketing Food Products

4. Associated Institute Type(s)

- 1862 Research

Outcome # 2

1. Outcome Target

Number of research programs to develop new biosensors and DNA chips that can rapidly and accurately detect a broad spectrum of harmful organisms in food and water, such as E. coli, Salmonella, Listeria, Campylobacter, Cryptosporidium and

2. Outcome Type : Change in Action Outcome Measure

2011:3	**2012:**3	**2013:**3	**2014:**3	**2015:**3

3. Associated Knowledge Area(s)

- 402 - Engineering Systems and Equipment
- 404 - Instrumentation and Control Systems
- 503 - Quality Maintenance in Storing and Marketing Food Products

4. Associated Institute Type(s)

- 1862 Research

Outcome # 3

1. Outcome Target

Number of adults with new and improved knowledge on non-food and bioeconomy related products and processes.

2. Outcome Type : Change in Knowledge Outcome Measure

2011:25	**2012:**25	**2013:**25	**2014:**25	**2015:**25

3. Associated Knowledge Area(s)

- 511 - New and Improved Non-Food Products and Processes

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 4

1. Outcome Target

Number of research programs to identify breeding and genetic improvement related to food quality, nutrition and processing.

2. Outcome Type : Change in Knowledge Outcome Measure

2011:9	**2012:**9	**2013:**9	**2014:**9	**2015:**9

3. Associated Knowledge Area(s)

- 501 - New and Improved Food Processing Technologies
- 502 - New and Improved Food Products

4. Associated Institute Type(s)

- 1862 Research

Outcome # 5

1. Outcome Target

Number of research programs to develop packaging systems to enhance food quality and shelf life.

2. Outcome Type : Change in Condition Outcome Measure

2011:2	**2012:**2	**2013:**2	**2014:**2	**2015:**2

3. Associated Knowledge Area(s)

- 402 - Engineering Systems and Equipment
- 503 - Quality Maintenance in Storing and Marketing Food Products

4. Associated Institute Type(s)

- 1862 Research

Outcome # 6

1. Outcome Target

Number of research programs to connect Michigan industries with research, education and entrepreneurial activity needed in the basic sciences, engineering and plant science and agriculture to provide the state with a foundation for vigorous development of a new biobased economic sector.

2. Outcome Type : Change in Knowledge Outcome Measure

2011:3	**2012:**3	**2013:**3	**2014:**3	**2015:**3

3. Associated Knowledge Area(s)

- 402 - Engineering Systems and Equipment
- 501 - New and Improved Food Processing Technologies

- 503 - Quality Maintenance in Storing and Marketing Food Products
- 511 - New and Improved Non-Food Products and Processes
- 512 - Quality Maintenance in Storing and Marketing Non-Food Products

4. Associated Institute Type(s)

- 1862 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Description

These programs are based on priorities set in the 2005-2006 issues identification process, as well as ongoing refinement and modification of these priorities and related programs moving forward. Public policy changes may affect priorities. Obesity, good nutrition and career-ready graduates are high priorities for Michigan's elected officials. IF priorities change, funds may be reallocated among programs. If funding is reduced, programming will be reduced. A drastic change in population could necessitate a change in priorities to meet the needs of target audiences. Public reactions to and perceptions of food safety and quality will influence the research and its outcomes.

V(K). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Case Study
- Comparisons between program participants (individuals, group, organizations) and non-participants
- Comparison between locales where the program operates and sites without program intervention

Description

The profitability, acceptance of, marketability, and functionality of new functional food and non-food products will be evaluated.

2. Data Collection Methods

- Sampling
- Whole population
- Mail
- Telephone
- On-Site

- Structured
- Unstructured
- Case Study
- Observation
- Portfolio Reviews
- Tests
- Journals

Description

When collecting data, we will consider the relative merit of each method of data collection. The method we choose will be influenced by the type of information we desire to analyze, the time available, and cost. While there are many data we could collect about each project, we will choose those that provide the most useful information and are within our budget. Most importantly, we want to ensure that the data collected are credible, accurate and useful to our organizations.

V(A). Planned Program (Summary)

Program # 5

1. Name of the Planned Program

Economics, Marketing and Policy

2. Brief summary about Planned Program

All Michigan agricultural producers benefit from improving their business and financial management skills, whether they raise dairy cows or grow blueberries. Marketing, distribution and other economic variables also play a critical role in the success and profitability of the state's agriculture and natural resources industries. The most perfect product in the world won't be deemed successful unless it gets into the hands of consumers who desire it.

Surrounded by the Great Lakes, Michigan also plays a key role in domestic and international shipping. Michigan expoerts about one-third of its agricultural commodities each year. In 2008, the state's annual exports generated about $1.7 billion and employed over 13,000 residents. Michigan ranked 20th in agricultural exports for fiscal year 2008. Soybeans, feed grains, fruits and vegetables and related products accounted for approximately 80 percent of the state's agricultural exports.

Research and education on international trade and development, economic policy, domestic and foreign policy, and community resource planning and development will help Michigan growers and producers navigate governmental regulations both here and abroad, as well as connect them with foreign buyers and markets.

3. Program existence : Mature (More then five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
601	Economics of Agricultural Production and Farm Management	20%		12%	
602	Business Management, Finance, and Taxation	12%		10%	
603	Market Economics	3%		7%	
604	Marketing and Distribution Practices	5%		5%	
605	Natural Resource and Environmental Economics	22%		14%	
606	International Trade and Development	3%		9%	
608	Community Resource Planning and Development	26%		12%	
609	Economic Theory and Methods	3%		13%	
610	Domestic Policy Analysis	5%		11%	
611	Foreign Policy and Programs	1%		7%	
	Total	100%		100%	

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

Agriculture production in Michigan has always been a business of narrow margins. Spring freezes, fluctuating prices and demand, drought, diseases and insects, production costs, land prices, development, and the availability of farm labor coupled with public policy changes make more than getting by a challenge under the best of conditions. Michigan's growers, consumers and agencies have identified the following priorities:

Identify current and emerging key public policy issues on trade, environmental, agricultural and food issues important to Michigan and analyze responses. Conduct research and education to improve the operations, business and financial management skills of Michigan producers so they can make decisions that are more sound financially and environmentally. Evaluate the competitiveness and marketing strategies of Michigan farm markets, greenhouses and other green industry retailers. Identify and evaluate human resources management practices in Michigan agricultural and green industries. Develop a framework to understand and analyze domestic and international trade policies and assess their impact on Michigan. Determine rationale for farmland preservation choices and how changes will affect the Michigan tax base. Develop models to estimate the demand for and value of recreational fisheries and wildlife resources. Identify and evaluate the policy, technology and marketing issues faced by Michigan organic growers and develop responses. Market data show that citizens prefer small, mixed-use communities in which they can meet their basic needs within a five-minute walk.

2. Scope of the Program

- In-State Extension
- In-State Research
- Multistate Research
- Integrated Research and Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

Michigan agricultural and natural resources producers have asked for research on economics, management, policy and marketing to keep their operations growing and profitable. Meeting these needs will also ensure that Michigan citizens have access to a plentiful, secure, high-quality food supply and a clean, sustainable environment. Funding will remain constant or decrease.

2. Ultimate goal(s) of this Program

The ultimate goals of this program are to: enhance the profitability of Michigan agriculture and natural resources industries; enhance rural and urban community developoment; identify current and emerging key public policies addressing trade, environmental, agricultural and food issues of particular import to policymakers, taxpayers, consumers and business persons; provide economic intelligence to facilitate adjustments in agricultural systems because of the opportunities created by the increased demand for ethanol and other biofuels and the challenges posed by climate change; understand how food system conflicts can be transformed into opportunities for citizens to have a voice related to this area; develop and implement effective youth smoking intervention programs that involve school tobacco programs; provide Michigan citizens with a healthy environment and a secure, plentiful food supply; and help communities use planning and zoning effectively to meet community goals.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2011	32.4	0.0	10.0	0.0
2012	32.4	0.0	10.0	0.0

Year	Extension		Research	
	1862	1890	1862	1890
2013	32.4	0.0	10.5	0.0
2014	32.4	0.0	10.5	0.0
2015	32.4	0.0	10.5	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Identify current and emerging key public policy issues on trade, environmental, agricultural and food issues important to Michigan and analyze responses. Conduct research and education to improve the operations, business and financial management skills of Michigan producers so they can make decisions that are more sound financially and environmentally. Evaluate the competitiveness and marketing strategies of Michigan farm markets, greenhouses and other green industry retailers. Identify and evaluate human resources management practices in Michigan agricultural and green industries. Develop a framework to understand and analyze domestic and international trade policies and assess their impact on Michigan. Evaluate how Michigan citizens use the Internet when searching for information about a vacation destination or planning a vacation. Determine rationale for farmland preservation choices and how changes will affect the Michigan tax base. Develop models to estimate the demand for and value of recreational fisheries and wildlife resources. Identify and evaluate the policy, technology and marketing issues faced by Michigan organic growers and develop responses. Teach financial management skills, business organization, estate planning, management information systems, strategic management, alternative sustainable production and marketing systems to agriculture and natural resources producers and businesses. Assist agencies, organizations, local governmental units and individuals in pursuing a cultural economic development strategy. Offer business retention and expansion support. Help people recognize, understand and appreciate multicultural differences. Provide entrepreneurship education to a broad audience, including individuals, business owners, youth and communities. Offer communities consultative, diagnostic and educational assistance in planning and zoning to meet community land-use goals.

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
● Education Class	● Newsletters
● Workshop	● TV Media Programs
● Group Discussion	● Web sites
● One-on-One Intervention	● Other 1 (News Releases)
● Demonstrations	● Other 2 (Annual Report/Magazine)

3. Description of targeted audience

Agriculture and natural resources producers and industry representatives; tourism industry representatives; state agency representatives; private citizens; school administrators; local, state and federal elected officials and policymakers.

V(G). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons(contacts) to be reached through direct and indirect contact methods

	Direct Contact Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
2011	5410	10800	0	0
2012	5410	10800	0	0
2013	5410	10800	0	0
2014	5410	10800	0	0
2015	5410	10800	0	0

2. (Standard Research Target) Number of Patent Applications Submitted

2011:7 **2012:**7 **2013:**8 **2014:**8 **2015:**8

3. Expected Peer Review Publications

Year	Research Target	Extension Target	Total
2011	35	1	36
2012	35	1	36
2013	36	2	38
2014	36	2	38
2015	36	2	38

V(H). State Defined Outputs

1. Output Target

- Number of research programs on economics, marketing and policy.

2011:28 **2012:**28 **2013:**29 **2014:**29 **2015:**29

- Number of adult participants trained in economics of agricultural production and farm management.

2011:800 **2012:**800 **2013:**800 **2014:**800 **2015:**800

- Number of adult participants trained in business management, finance and taxation.

2011:1500 **2012:**1500 **2013:**1500 **2014:**1500 **2015:**1500

- Number of adult participants trained in natural resource and environmental economics.

2011:1500 **2012:**1500 **2013:**1500 **2014:**1500 **2015:**1500

- Number of adult participants trained in community resource planning and development.

2011:1610 **2012:**1610 **2013:**1610 **2014:**1610 **2015:**1610

V(I). State Defined Outcome

O. No.	Outcome Name
1	Number of adult participants with increased knowledge in economics of agricultural production and farm management.
2	Number of adult participants with increased knowledge in business management, finance and taxation.
3	Number of adult participants with increased knowledge in natural resource and environmental economics.
4	Number of adult participants with increased knowledge in community resource planning and development.
5	Number of research programs to identify current and emerging key public policy issues on trade, environmental, agricultural and food issues important to Michigan and analyze responses.
6	Number of research programs to improve the operations, business and financial management skills for Michigan producers so they can make decisions that are more sound financially and environmentally.
7	Number of research programs to evaluate the competitiveness and marketing strategies and human resources management practices of Michigan farm markets, greenhouses and other green industry retailers.
8	Number of research programs to develop a framework to understand and analyze domestic and international trade policies and assess their impact on Michigan.
9	Number of research programs to develop models to estimate the demand for and value of recreational fisheries and wildlife resources.

Outcome # 1

1. Outcome Target

Number of adult participants with increased knowledge in economics of agricultural production and farm management.

2. Outcome Type : Change in Knowledge Outcome Measure

2011:	**2012:**	**2013:**	**2014:**	**2015:**
700	700	700	700	700

3. Associated Knowledge Area(s)

- 601 - Economics of Agricultural Production and Farm Management
- 602 - Business Management, Finance, and Taxation

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 2

1. Outcome Target

Number of adult participants with increased knowledge in business management, finance and taxation.

2. Outcome Type : Change in Knowledge Outcome Measure

2011:	**2012:**	**2013:**	**2014:**	**2015:**
1275	1275	1275	1275	1275

3. Associated Knowledge Area(s)

- 601 - Economics of Agricultural Production and Farm Management
- 602 - Business Management, Finance, and Taxation

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 3

1. Outcome Target

Number of adult participants with increased knowledge in natural resource and environmental economics.

2. Outcome Type : Change in Knowledge Outcome Measure

2011:	**2012:**	**2013:**	**2014:**	**2015:**
1275	1275	1275	1275	1275

3. Associated Knowledge Area(s)

- 605 - Natural Resource and Environmental Economics

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 4

1. Outcome Target

Number of adult participants with increased knowledge in community resource planning and development.

2. Outcome Type : Change in Knowledge Outcome Measure

2011:1368	**2012:**1368	**2013:**1368	**2014:**1368	**2015:**1368

3. Associated Knowledge Area(s)

- 608 - Community Resource Planning and Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 5

1. Outcome Target

Number of research programs to identify current and emerging key public policy issues on trade, environmental, agricultural and food issues important to Michigan and analyze responses.

2. Outcome Type : Change in Action Outcome Measure

2011:8	**2012:**8	**2013:**9	**2014:**9	**2015:**9

3. Associated Knowledge Area(s)

- 601 - Economics of Agricultural Production and Farm Management
- 605 - Natural Resource and Environmental Economics
- 608 - Community Resource Planning and Development
- 610 - Domestic Policy Analysis

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 6

1. Outcome Target

Number of research programs to improve the operations, business and financial management skills for Michigan producers so they can make decisions that are more sound financially and environmentally.

2. Outcome Type : Change in Knowledge Outcome Measure

2011:9	**2012:**9	**2013:**9	**2014:**9	**2015:**9

3. Associated Knowledge Area(s)

- 601 - Economics of Agricultural Production and Farm Management
- 602 - Business Management, Finance, and Taxation
- 604 - Marketing and Distribution Practices

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 7

1. Outcome Target

Number of research programs to evaluate the competitiveness and marketing strategies and human resources management practices of Michigan farm markets, greenhouses and other green industry retailers.

2. Outcome Type : Change in Action Outcome Measure

2011:4	**2012:**4	**2013:**4	**2014:**4	**2015:**4

3. Associated Knowledge Area(s)

- 602 - Business Management, Finance, and Taxation
- 603 - Market Economics
- 604 - Marketing and Distribution Practices
- 608 - Community Resource Planning and Development
- 609 - Economic Theory and Methods

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 8

1. Outcome Target

Number of research programs to develop a framework to understand and analyze domestic and international trade policies and assess their impact on Michigan.

2. Outcome Type : Change in Action Outcome Measure

2011:5	**2012:**5	**2013:**5	**2014:**5	**2015:**5

3. Associated Knowledge Area(s)

- 601 - Economics of Agricultural Production and Farm Management
- 605 - Natural Resource and Environmental Economics
- 606 - International Trade and Development
- 610 - Domestic Policy Analysis
- 611 - Foreign Policy and Programs

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 9

1. Outcome Target

Number of research programs to develop models to estimate the demand for and value of recreational fisheries and wildlife resources.

2. Outcome Type : Change in Action Outcome Measure

2011:2	**2012:**2	**2013:**2	**2014:**2	**2015:**2

3. Associated Knowledge Area(s)

- 603 - Market Economics
- 605 - Natural Resource and Environmental Economics

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Description

Agricultural and natural resources markets and economies are affected by a variety of natural factors and public policy changes. Changes in population will affect farm labor.

V(K). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Case Study
- Comparisons between program participants (individuals, group, organizations) and non-participants
- Comparison between locales where the program operates and sites without program intervention

Description

All research and education programs on policy, management and economics will be evaluated to see how well they work, as well as how many people adopt them and the changes that result.

2. Data Collection Methods

- Sampling
- Whole population
- Mail
- Telephone
- On-Site
- Structured
- Unstructured
- Case Study
- Observation
- Portfolio Reviews
- Tests
- Journals

Description

When collecting data, we will consider the relative merit of each method of data collection. The method we choose will be influenced by the type of information we desire to analyze, the time available, and cost. While there are many data we could collect about each project, we will choose those that provide the most useful information and are within our budget. Most importantly, we want to ensure that the data collected are credible, accurate and useful to our organizations.

V(A). Planned Program (Summary)

Program # 6

1. Name of the Planned Program

Animal Production and Protection

2. Brief summary about Planned Program

Animal agriculture and its associated products -- milk, meat, wool, eggs, cheese and butter -- make up a significant portion of Michigan's economy. The state is ninth in the country in milk production, 14th in hog production and 30th in cattle production. Michigan cattle and calves were valued at $1.23 billion, with cash receipts of $384.9 million in 2008; and the value of poultry production -- including eggs and chickens -- was $211.5 million in 2008, up 36 percent from 2007. Besides food animals, Michigan also has prosperous horse racing, pleasure and sport riding industries.

Enhancing profitability and quality in animal agriculture means research on new methods to combat diseases and parasites, as well as work on selecting animals with desirable traits and studies on nutrition and animal management systems. Because almost all animal production involves large up-front investments, research on improving animals' reproductive performance and reducing environmental stress is also critically important. The MSU Center for Animal Functional Genomics offers researchers the opportunity to use technology that allows them to track animals' response to stress from disease, giving birth, shipping and other environmental factors at the cellular and molecular levels. The center is allowing MSU researchers and educators to become national leaders in understanding immune system response at the genetic level in additional to other critical research efforts in animal production and protection.

3. Program existence : Mature (More then five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
301	Reproductive Performance of Animals	3%		10%	
302	Nutrient Utilization in Animals	5%		10%	
303	Genetic Improvement of Animals	2%		8%	
304	Animal Genome	4%		7%	
305	Animal Physiological Processes	5%		9%	
307	Animal Management Systems	41%		18%	
308	Improved Animal Products (Before Harvest)	1%		2%	
311	Animal Diseases	28%		20%	
314	Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards Affecting Animals	4%		2%	
315	Animal Welfare/Well-Being and Protection	3%		12%	
605	Natural Resource and Environmental Economics	1%		2%	
806	Youth Development	3%		0%	
	Total	100%		100%	

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

Michigan animal industries face different, and, one could argue, more numerous challenges than their crop-producing counterparts. While both groups have to deal with weather, insects and diseases, animal producers also have to worry about their animals' reproductive health and efficiency, nutrient management, feeding/milking schedules, as well as the stress of shipping, weaning, crowding and giving birth.

Michigan animal producers have identified several research and educational priorities for the coming years: Continue to develop and update the Michigan Agriculture Environmental Assurance Program guidelines and offer more education and outreach on the program. Develop new management strategies to increase profitability for animal producers. Develop tracking mechanism to quickly and accurately control populations when outbreaks of infectious diseases occur. Develop new systems and strategies to keep animals healthy and to identify and treat diseases before they spread through herds. Develop systems and strategies to ensure the welfare of animals from birth to rendering. Develop new technologies to identify animals with superior reproduction capability to increase profitability. Develop new systems (pre- and post-harvest) to improve the quality of animal products.

2. Scope of the Program

- In-State Extension
- In-State Research
- Multistate Research
- Integrated Research and Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

Michigan animal producers have asked for research and education to keep their operations profitable and growing, their animals healthy and their products high quality. Research on reproduction, nutrient utilization, genetics, environmental stresses, management systems, diseases and disease tracking, and animal welfare will meet these needs of producers, as well as ensure that Michigan residents have access to high-quality, plentiful animal products. Funding will remain constant or decrease.

2. Ultimate goal(s) of this Program

To provide new strategies and technologies to keep Michigan animal producers thriving and profitable, to provide a safe, high-quality supply of animal products to Michigan residents, and to ensure the humane treatment, health and well-being of animals.

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2011	13.5	0.0	15.0	0.0
2012	13.5	0.0	15.0	0.0
2013	13.5	0.0	15.5	0.0
2014	13.5	0.0	15.5	0.0
2015	13.5	0.0	15.5	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Understanding of the processes that control/influence reproduction at the molecular and genetic level. Develop and test new cropping, grazing and feeding strategies for cattle, sheep and other ruminants for maximum profitability and animal health and minimal environmental impact. Develop and evaluate new nutritional management strategies for non-ruminant animals for maximum animal health and minimal environmental impact. Develop and evaluate management tools and strategies for animal manure management that is cost-effective, easy to implement and exceeds stringent environmental standards set by the state. Develop and evaluate management/training strategies for race horses to reduce injuries. Develop an understanding of the molecular processes that influence growth and meat quality in food animals. Add to the understanding of various food animal genomes by improving and integrating genetic maps. Understanding of the genetic and molecular processes that control/influence the immune system in food animals to create new disease detection and tracking technologies. Develop and evaluate new tools and strategies to detect, prevent and control emerging and reemerging livestock and poultry diseases, including bovine viral diarrhea virus, leptospirosis, bovine tuberculosis, *Campylocacter jejuni*, West Nile virus, and bovine spongiform encephalitis. Understanding of the environmental fate and biological effects of vaccines, steroids and other drugs fed to animals. Assist beef producers with implementing the mandatory electronic identification system and demonstrate methods to use the system to sharpen management skills. Provide livestock producers with knowledge and skills to develop and maintain herd-health systems. Provide animal industry with up-to-date animal health information. Improve farm-specific environmental stewardship related to manure management, including developing whole-farm nutrient management plans, manure value, land use and neighbor relations.

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension

Direct Methods	Indirect Methods
● Education Class ● Workshop ● Group Discussion ● One-on-One Intervention ● Demonstrations	● Public Service Announcement ● Newsletters ● TV Media Programs ● Web sites ● Other 1 (News Releases) ● Other 2 (Annual Report/Magazine)

3. Description of targeted audience

Michigan animal producers, agriculture and natural resources industry representatives, biotechnology company representatives, and state agency representatives and state and local elected officials.

V(G). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons(contacts) to be reached through direct and indirect contact methods

	Direct Contact Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
2011	1825	3600	11000	0
2012	1825	3600	11000	0
2013	1825	3600	11000	0
2014	1825	3600	11000	0
2015	1825	3600	11000	0

2. (Standard Research Target) Number of Patent Applications Submitted

2011:9 **2012:**9 **2013:**10 **2014:**10 **2015:**10

3. Expected Peer Review Publications

Year	Research Target	Extension Target	Total
2011	50	1	51
2012	50	1	51
2013	50	2	52
2014	50	2	52
2015	50	3	53

V(H). State Defined Outputs

1. Output Target

- Number of research programs on animal production and protection.

  2011:40 **2012:**40 **2013:**41 **2014:**41 **2015:**41

- Number of adult participants trained in animal management systems.

  2011:1500 **2012:**1500 **2013:**1500 **2014:**1500 **2015:**1500

- Number of youth participants trained in animal management systems.

  2011:11000 **2012:**11000 **2013:**11000 **2014:**11000 **2015:**11000

- Number of adult participants trained in animal diseases.

  2011:1000 **2012:**1000 **2013:**1000 **2014:**1000 **2015:**1000

V(I). State Defined Outcome

O. No.	Outcome Name
1	Number of adult participants with increased knowledge about animal management systems.
2	Number of youth participants with increased knowledge about animal management systems.
3	Number of adult participants with increased knowledge of animal diseases.
4	Number of research programs to understand the processes that control/influence reproduction at the molecular and genetic level.
5	Number of research programs to develop and test new cropping, grazing and feeding strategies for cattle, sheep and other ruminants.
6	Number of research programs to develop and evaluate new nutritional management strategies for non-ruminant animals.
7	Number of research programs to understand the molecular processes that influence growth and meat quality in food animals.
8	Number of research programs to add to the understanding of various food animal genomes by improving and integrating genetic maps.
9	Number of research programs to develop and evaluate new tools and strategies to detect, prevent and control emerging and reemerging livestock and poultry diseases.
10	Number of research programs to understand the environmental fate and biological effects of vaccines, steroids and other substances fed to animals.
11	Number of research programs to develop and evaluate management/training strategies for horses to reduce injuries.
12	Number of research programs to add to the understanding of animal behavior and welfare.

Outcome # 1

1. Outcome Target

Number of adult participants with increased knowledge about animal management systems.

2. Outcome Type : Change in Knowledge Outcome Measure

2011:1260	**2012:**1260	**2013:**1260	**2014:**1260	**2015:**1260

3. Associated Knowledge Area(s)

- 307 - Animal Management Systems
- 311 - Animal Diseases

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 2

1. Outcome Target

Number of youth participants with increased knowledge about animal management systems.

2. Outcome Type : Change in Knowledge Outcome Measure

2011:9350	**2012:**9350	**2013:**9350	**2014:**9350	**2015:**9350

3. Associated Knowledge Area(s)

- 307 - Animal Management Systems
- 311 - Animal Diseases
- 806 - Youth Development

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 3

1. Outcome Target

Number of adult participants with increased knowledge of animal diseases.

2. Outcome Type : Change in Knowledge Outcome Measure

2011:850	**2012:**850	**2013:**850	**2014:**850	**2015:**850

3. Associated Knowledge Area(s)

- 307 - Animal Management Systems
- 311 - Animal Diseases

4. Associated Institute Type(s)

- 1862 Extension

Outcome # 4

1. Outcome Target

Number of research programs to understand the processes that control/influence reproduction at the molecular and genetic level.

2. Outcome Type : Change in Condition Outcome Measure

2011:6	**2012:**6	**2013:**6	**2014:**6	**2015:**6

3. Associated Knowledge Area(s)

- 301 - Reproductive Performance of Animals
- 303 - Genetic Improvement of Animals
- 304 - Animal Genome
- 305 - Animal Physiological Processes
- 314 - Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards Affecting Animals

4. Associated Institute Type(s)

- 1862 Research

Outcome # 5

1. Outcome Target

Number of research programs to develop and test new cropping, grazing and feeding strategies for cattle, sheep and other ruminants.

2. Outcome Type : Change in Condition Outcome Measure

2011:5	**2012:**5	**2013:**5	**2014:**5	**2015:**5

3. Associated Knowledge Area(s)

- 302 - Nutrient Utilization in Animals
- 307 - Animal Management Systems

4. Associated Institute Type(s)

- 1862 Research

Outcome # 6

1. Outcome Target

Number of research programs to develop and evaluate new nutritional management strategies for non-ruminant animals.

2. Outcome Type : Change in Action Outcome Measure

2011:3	**2012:**3	**2013:**3	**2014:**3	**2015:**3

3. Associated Knowledge Area(s)

- 302 - Nutrient Utilization in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)

4. Associated Institute Type(s)

- 1862 Research

Outcome # 7

1. Outcome Target

Number of research programs to understand the molecular processes that influence growth and meat quality in food animals.

2. Outcome Type : Change in Condition Outcome Measure

2011:2	**2012:**2	**2013:**3	**2014:**3	**2015:**3

3. Associated Knowledge Area(s)

- 303 - Genetic Improvement of Animals
- 305 - Animal Physiological Processes
- 308 - Improved Animal Products (Before Harvest)

4. Associated Institute Type(s)

- 1862 Research

Outcome # 8

1. Outcome Target

Number of research programs to add to the understanding of various food animal genomes by improving and integrating genetic maps.

2. Outcome Type : Change in Knowledge Outcome Measure

2011:6	**2012:**6	**2013:**6	**2014:**6	**2015:**6

3. Associated Knowledge Area(s)

- 304 - Animal Genome
- 305 - Animal Physiological Processes

4. Associated Institute Type(s)

- 1862 Research

Outcome # 9

1. Outcome Target

Number of research programs to develop and evaluate new tools and strategies to detect, prevent and control emerging and reemerging livestock and poultry diseases.

2. Outcome Type : Change in Action Outcome Measure

2011:7	**2012:**7	**2013:**7	**2014:**7	**2015:**7

3. Associated Knowledge Area(s)

- 303 - Genetic Improvement of Animals
- 305 - Animal Physiological Processes
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases
- 315 - Animal Welfare/Well-Being and Protection

4. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

Outcome # 10

1. Outcome Target

Number of research programs to understand the environmental fate and biological effects of vaccines, steroids and other substances fed to animals.

2. Outcome Type : Change in Condition Outcome Measure

2011:6	**2012:**6	**2013:**6	**2014:**6	**2015:**6

3. Associated Knowledge Area(s)

- 307 - Animal Management Systems
- 311 - Animal Diseases
- 314 - Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards Affecting Animals
- 315 - Animal Welfare/Well-Being and Protection

4. Associated Institute Type(s)

- 1862 Research

Outcome # 11

1. Outcome Target

Number of research programs to develop and evaluate management/training strategies for horses to reduce injuries.

2. Outcome Type : Change in Knowledge Outcome Measure

2011:3	**2012:**3	**2013:**3	**2014:**3	**2015:**3

3. Associated Knowledge Area(s)

- 307 - Animal Management Systems
- 315 - Animal Welfare/Well-Being and Protection

4. Associated Institute Type(s)

- 1862 Research

Outcome # 12

1. Outcome Target

Number of research programs to add to the understanding of animal behavior and welfare.

2. Outcome Type : Change in Knowledge Outcome Measure

2011:2	**2012:**2	**2013:**2	**2014:**2	**2015:**2

3. Associated Knowledge Area(s)

- 307 - Animal Management Systems
- 315 - Animal Welfare/Well-Being and Protection

4. Associated Institute Type(s)

- 1862 Research

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Description

If funding is reduced or moved to another program, there will be less work in this area.

V(K). Planned Program (Evaluation Studies and Data Collection)

1. Evaluation Studies Planned

- After Only (post program)
- Before-After (before and after program)

- Case Study
- Comparisons between program participants (individuals, group, organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- Comparison between locales where the program operates and sites without program intervention

Description

As new management strategies are introduced, producers will be surveyed before and after education and training to see how many change their practices.

2. Data Collection Methods

- Sampling
- Whole population
- Mail
- Telephone
- On-Site
- Structured
- Unstructured
- Case Study
- Observation
- Portfolio Reviews
- Tests
- Journals

Description

When collecting data, we will consider the relative merit of each method of data collection. The method we choose will be influenced by the type of information we desire to analyze, the time available, and cost. While there are many data we could collect about each project, we will choose those that provide the most useful information and are within our budget. Most importantly, we want to ensure that the data collected are credible, accurate and useful to our organizations.