

# 2012 Ohio State University Combined Research and Extension Plan of Work

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## I. Plan Overview

### 1. Brief Summary about Plan Of Work

Ohio State University Extension (OSU Extension) and Ohio Agricultural Research and Development Center (OARDC) enter the planning phase for 2012 -2016 with a perspective of 'rebuilding'. The Wooster Ohio campus that serves as a the major OARDC research station and administration center, and houses OSU Extension's Northeast Regional offices, is in the process of rebuilding following the devastating tornado of 2010. While a portion of remediation was completed in 2010, deconstruction and reconstruction will continue for a significant portion of this planning period. In the wake of the tornado, ten structures have been or will be deconstructed, two major buildings, including the Food, Agricultural and Biological Engineering, will be replaced or have major repair, and nine other buildings require significant remediation and repair. Over 33,000 square feet of storage space was lost to the storm. While the state and federal base budgets for FY 12 and 13 will probably not support program growth for either OSU Extension or OARDC, modest recovery is expected for future years. Thus some expansion and rebuilding of programs are expected within the latter part of this planning period. Like research and extension stations nationwide, budget fluctuations have not impacted mission. On the other hand, availability of base resource support, both federal and state, will continue to impact the scope and robustness of science and services that can be delivered to stakeholders. A 2010/2011 paper, 'Investing in a Better Future through Public Agricultural Research', coauthored by a CFAES faculty member, Luther Tweeten, provides an excellent presentation of data related to the value of investments in agricultural experiment stations. As to mission, OARDC and OSU Extension, administered through the office of the Ohio State University Vice President, Agriculture, are central to accomplishing the land grant mission of The Ohio State University and fulfilling its Academic Plan. That mission is inclusive of an active state government agenda to grow Ohio economic sectors through research, development, and extension investments. Throughout this planning period the primary focus will be on extension and research activities that result in job growth and economic recovery. Likewise the mission is inclusive of the National Institute of Food and Agriculture's (NIFA) national agenda and its five national priority areas. The food and agriculture bioeconomy in Ohio is a 100 plus billion dollar enterprise, employing over one million people, and depends in great part on the OSU research, extension, and development program planning reported herein. On an annual basis external reviewers (Battelle) reported that OARDC annually (in 2008 dollars) directly generates: \$156.3 million in total Ohio economic output; 1,609 jobs in Ohio; \$59.2 million in personal income for Ohio residents; and \$5.5 million in annual state tax revenues. Battelle calculated OSU Extension's state impact as \$159 million in total Ohio economic output; 1,918 jobs in Ohio; \$64 million in personal income for Ohio residents; and \$4.8 million in annual state tax revenues. The goal for 2012 - 2016 programs is to help grow the Ohio economy by making incremental improvements in the food, agricultural, and environmental economies.....again, with particular focus on activities that grow jobs. The College of Food, Agricultural, and Environmental Sciences (CFAES), and in turn OARDC and OSU Extension, will continue to be guided by CFAES' 2008 Strategic Plan through the first half of this 2012 -2016 Plan of Work. All activities within that Strategic Plan adhere to the College's long established paradigm calling for consideration of four elements - production efficiency, economic viability through value added, social acceptably of our contributions, and environmental compatibility of products and practices emanating from our planned programs. Likewise the Strategic Plan reflects the goals of Ohio State University and the Ohio Board of Regents. Additionally, the APLU/ESCAP Science Roadmap for Food and Agriculture will inform OARDC and OSU Extension's programs throughout this planning period. That Roadmap identifies the following areas, all central to the collective mission of this reporting institution: (1) an interdependent global economy, (2) climate variability, (3) demands on the

environment and the natural resource base, (4) renewable bioenergy sources and energy security, (5) health care costs, (6) trends toward obesity, (7) hunger and food security for the world's population, and (8) challenges to individual, family, and community well-being. This Plan of Work, the CFAES Strategic Plan, NIFA's national priorities, and the Roadmap all reflect a common purpose. Planned Programs for 2012 -2016 are designed to foster knowledge acquisition, dissemination, and scientific advancements to help mitigate the many financial and social problems facing society today. Issues of climate change, global food safety and security, health issues related to diet such as hunger, obesity, nutrition, and disease, and securing sustainable energy supplies, all, can be positively influenced by the research and extension programs planned for herein. The CFAES Strategic Plan explicitly focuses on advancing education, scholarship, knowledge acquisition, and information diffusion in three signature areas: (1) food security, production, and human health;

(2) environmental quality and sustainability; and (3) advanced bioenergy and biobased products. OSU Extension and OARDC will continue to address these signature areas under the moniker of 'agbioscience' throughout this Plan of Work period. There exists a revolution in the integration of bioscience and agricultural knowledge, thus the origin of the term 'agbioscience'. Agbioscience is an inclusive term for the physical, biological, environmental, chemical, engineering, social, and economic sciences utilized in food, agricultural, and environmental research and extension programming. Rapid advancements in agbioscience are and will continue to provide unprecedented opportunities for global economic and societal advancement. OARDC is the singular research and development hub for agbioscience research in Ohio and OSU Extension is the center for associated education and human capital development. According to a series of Battelle reports (2004 - 2009), the institution is ideally positioned to lead Ohio in realizing progress in all significant aspects of the bioeconomy and contribute to a broad national agenda. Collectively this capacity is targeted to new discoveries and associated human capital development that will result in job growth and economic prosperity that is sustainable over time. To address the problems we face requires us to build new capacity to respond to demand. Local food systems, for example, pose a central need. OARDC has received a grant from Ohio's Fund for Our Economic Future to create a system that promotes more use of locally produced foods and rely less on exports. Only one percent of the food in northeast Ohio is locally sourced. Raising that to 10% would keep an additional \$1.3 billion in the region. OSU Extension, in cooperation with OARDC and partners such as the Ohio Farm Bureau, will continue throughout this planning period to address this problem through their leadership of Ohio MarketMarker. This is a web-based service that connects food producers, buyers, and others such as farmers, grocery stores, chefs, caterers, and processors with an emphasis on using more locally grown foods, locally. To leverage this capacity, the three signature areas identified in the CFAES 2008 Strategic Plan continue to align the state's highest needs with this institution's greatest strengths. These three areas have substantial overlap with NIFA's five national priority areas. Likewise these needs are found throughout the nation and world. The OSU institutional perspective will continue to be from the local stakeholder to the global marketplace. As we plan for the 2012 -2016 period, globalization will continue to provide windows of opportunity for positioning our university, state, and nation to leverage and contribute to economies driven by new knowledge and new technology/materials platforms. While OARDC and OSU Extension provide leadership in many new economies, we also continue to focus on traditional areas where needs exist. Both are accomplished by leveraging federal and state base funding through competitive processes and the utilization of stakeholder input into planning processes, scientific peer review, and stakeholder review of outputs and impacts. The stability of these base funds is critical to delivering research, development, and extension activities and related impacts that are commensurate with demand. If research and extension stations nationwide are to contribute to the extent they are capable, and demand dictates, program scope and robustness cannot be further eroded. OSU Extension and OARDC, like their counterparts nationwide, have the capacity to continue to provide leadership in regrowing the economy and putting people back to work. The approach to harnessing this capacity has changed to one where advances in agbioscience is less dependent on only making and growing things and more dependent on applying ideas and innovation to both new and existing products and practices. Knowledge has replaced raw materials and physical labor as the source of value, wealth, and economic prosperity. Our programs are positioning the agbioscience foci within knowledge-based industry clusters.

Advances in agbioscience have shifted, and will shift even more in this planning period, beyond food and fiber production, alone, toward goals of also improving employment opportunities, public health, social well-being, energy independence, global food supply and security, and environmental well-being. Battelle (2009) reported the following: Agbioscience innovations are driving new, high visibility economic opportunities for American states, and the State of Ohio has been an early mover in recognizing the economic development potential of biobased resources. For Ohio, the foremost in-state driver of agbioscience R and D is Ohio State University Ohio Agricultural Research and Development Center (OARDC) partnering with OSU Extension to build the human capital necessary to capitalize on the R and D activities. A research, extension, and development system has been put in place that provides a continuum of support including: support for early stage basic science investigations in areas with potential signature platform linkages; development of applied R and D programs focused on translating basic science discoveries into practical innovations; and the testing of applied R and D discoveries for true market potential through scale-up and piloting projects, demonstration projects, and market feasibility assessment. This is resulting in technology transfer, cluster business attraction, new enterprise development, advancements existing businesses clusters, and in general Ohio agbioscience business cluster growth and expansion. The knowledge gained is further extended to stakeholders with the ultimate aim of advancing the Ohio economy and growing jobs. OARDC and OSU Extension will continue to build on and grow the strengths recognized by Battelle well beyond this 2012 -2016 timeframe. OSU Extension and OARDC will continue to work collaboratively throughout the 2012 -2016 planning period to advance their land grant mission and accomplish specific objectives such as advancing the Ohio economy and growing jobs. Much centrality exists because both organizations work within the College of Food, Agricultural, and Environmental Sciences' Strategic Plan with primary focus on three aforementioned signature areas: (1) food security, production, and human health; (2) environmental quality and sustainability; and (3) advanced bioenergy and biobased products. Also a large number of faculty members, 88, who work in these areas hold a joint appointment in both OARDC and OSU Extension. Almost all commodity and industry support programs will continue to have teams of researchers and extension faculty and staff working collaboratively with stakeholders in these respective programs. OARDC and OSU Extension faculty will continue to partner with multiple colleges at OSU, with colleagues worldwide, and with business, industry, public interest groups, and multiple stakeholders in a collaborative manner. Planning calls for OARDC and OSU Extension to be fully engaged with each other and with partners at all levels of an agbioscience product - service value chain...from idea inception to the impact on society...often referred to as the 'gate to plate' or 'cell to sell' concept. One example of this collaborative effort that will be leveraged throughout this planning period is the BioHio Research Park, located on the OSU Wooster campus. That park will continue to support commercializing ideas and products from food, agricultural, and environmental research laboratories and moving them to the marketplace. OARDC and OSU Extension will continue to be fully engaged as the park serves as a catalyst for local and regional development by supporting the creation of an agbioscience industry cluster in northeast Ohio and propelling an economic shift for Ohio. Exemplary of the outputs and impacts that will be built upon is the efforts of one new business in the park to supply up to 25% of the Wooster campus' energy needs with bioenergy generated from food processing waste streams. This park is complimented by an existing food, agricultural, and environmental research, extension, and development center (South Centers) in southern Ohio that serves the economically depressed Appalachian region of the state. Economic development is the primary theme at this Center. Programs that will continue to grow at South Centers, for example, are those that seek to find crops to replace tobacco, new industry development such as aquaculture, and an extension program for enterprise development. That Center's focus on underserved populations is critical to the collective mission of OARDC and OSU Extension. OARDC and OSU Extension are playing new and different roles aimed at assisting Ohio and the nation in turning around the economy, growing jobs, and creating sustainable agbioscience growth and development. A comprehensive view of the value chain will continue to drive the research and extension agenda throughout this planning period. That value chain is from agricultural and natural resource commodities to end products such as foods, fuels, fibers, polymers, etc. Included in the value chains are environmental and social services and benefits. In addition, major economic shifts/recessional trends, climate change, rising energy costs, trade globalization, changing

consumer preferences, public concern about food, environment, and energy security, and changes in the relationship between agriculture and neighboring communities, collectively, have and will continue to alter the context in which the OARDC and OSU Extension agenda is formulated and implemented. More so than ever a functional public - private framework is demanded. Emerging areas such as biotechnology, genomics, health, nutrition, advanced energy/materials, and ecosystem science are transforming the practices and products of agriculture. OSU Extension and OARDC will continue to partner with each other, with other OSU colleges, and with multiple external partners worldwide to accelerate these transformations. New institutional arrangements will continue to be developed that will foster transformational approaches in agbioscience. OARDC and OSU Extension will continue to find ways to lead and train others to lead. OARDC's role is providing the science for economic drivers while OSU Extension provides the leadership and training to engage and transform economies and lives. The overall emphasis is on creating jobs, adding value to products, advancing energy independency, and strengthening Ohio and national competitiveness, while leveraging human capital and enhancing the quality of life and quantity and quality of food, goods, and services for individuals and communities in Ohio and around the world, as environmental systems and natural resources are protected. To that end, OSU Extension and OARDC, individually and collectively, will continue to focus extensively on the three aforementioned CFAES signature areas, on the NIFA national priority areas, and on the recommendations found in the APLU/ESCOP Science Roadmap for Food and Agriculture. In 2004, a targeted effort was launched to expand the economic impact of Ohio's agbioscience economy. That successful venture contributed to the 2010 designation of The Ohio State University as the Ohio Center of Excellence in Agriculture, Food Production, and Bioproducts by the Ohio Board of Regents and the University System of Ohio. It is the only such designated center to be housed solely within a single university. That designation will be important throughout this planning period as we seek to contribute to the state's economic recovery. Also in 2010 CFAES joined with law, engineering, business, and health sciences at OSU creating a strategy for more rapidly commercializing university research that is determined to have great promise. A Proof of Concept Center has been established to build a business case and invest to prove the concept, as well as attract external capital, increase start-up companies, and attract partners and collaborators. This new effort is intended to build on CFAES' history of inventions and commercialization with its 123 invention reports and 40 patents awarded over the years. This new capacity will be built on throughout this 2012 - 2016 planning period. OARDC and OSU Extension recognize that all future gains are based in great part on its existing strengths and past achievements, as well as in the capacity to lead. OARDC, OSU Extension, and the College of Food, Agricultural and Environmental Science, in collaboration with stakeholders and partners, are committed to: (1) focusing on improving agricultural production; enhancing the quality of food and feed; ensuring an adequate, affordable, and safe food supply; and maintaining agrosecurity to ensure food security and the basics of nutritional health for a growing global population; (2) working to understand, protect, and remediate impacts to the environment and ecosystems to ensure long-term sustainability; and (3) to developing biomass-based advanced energy technologies and value-added biobased products such as fuels, specialty chemicals, and fiber products. OSU Extension and OARDC will continue to be characterized by: (1) recognizing and exploiting the continuum from fundamental to applied science; (2) generating knowledge and solving problems that span multiple economic, social, and ecological systems; (3) enhancing discovery, learning, engagement, and impact through partnerships; and (4) considering and integrating physical, chemical, economic, social, and ecological variables into sustainable systems that meet societal needs. Collectively these will continue to advance the land grant mission.

Note: The FTEs shown in this Plan of Work are based on programmatic assessments, and may not reflect actual FTEs expended.

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

Year	Extension		Research	
	1862	1890	1862	1890
2012	205.0	0.0	85.5	0.0
2013	200.0	0.0	85.5	0.0
2014	195.0	0.0	85.5	0.0
2015	195.0	0.0	85.5	0.0
2016	190.0	0.0	85.5	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 Non-University Panel
- Combined External and Internal University External Non-University Panel
- Expert Peer Review

**2. Brief Explanation**

Every year OARDC and OSU Extension expand their breath and depth of stakeholder contact. While this is appropriate, it is also more important than ever as we seek to advance science and service that will provide timely impacts. In particular for the 2012 -2016, the emphasis is to be on growing the economy of Ohio and creating jobs. To this end the merits of research and extension efforts need both internal and external input and review at all levels. OARDC and OSU Extension utilize various advisory committees at differing levels commensurate with the review and input required. Small internal competitive grants are peer reviewed by an internal panel of faculty and administrators representing all academic departments within the College. Other larger competitive grants are reviewed by panels of faculty and administrators and leading stakeholders who have expertise in the area of the award, e.g. agbioscience grants. When needed, faculty from outside the College are used as reviewers. Combined panels of academics and non- academics are being used more extensively as OARDC and OSU Extension seek to move research into the marketplace more quickly to respond to the new economic realities of the global economy and needs such as global food security. All OARDC and OSU Extension publications are either blind peer-reviewed or peer reviewed/juried before publication either in print or via electronic media. OARDC encourages publishing in higher tier peer reviewed journals and the tracking of citations of research publications. Those scholarly findings are also expected to appear trade journals, extension media, and in public media, including all the newer social media. OSU Extension develops long range program plans through a process involving Extension personnel from throughout the system, input of lay leaders in communities, incorporating data about Ohio's

population, and through collaboration with other agencies, institutions and organizations. Each of OSU Extension program areas conducts long range strategic planning to prioritize programming. Specialists from academic disciplines provide insight from research trends while county Extension personnel provide insight from local communities. Systematic prioritization processes, such as Delphi, are used. Program area personnel work together to identify key issues that cut across disciplines. Special task forces or teams then collaborate to identify priority program efforts to address these issues. Funding is then allocated to support program priorities. Programmatic resources such as personnel and materials reflect the program priorities. In addition, these priorities direct from what sources grant funds are sought. Once strategic plans are in place, there is continual review of plans to include the ability to be responsive to unanticipated issues. The system provides flexibility for extension educators to address these issues. In situations where grant monies are obtained, staff with specific, short-term employment contracts are hired to assist in meeting priority needs. Educator specialization is a way for the system to provide subject matter expertise close to local communities. Educators determine a subject matter specialization that relates to needs in their geographical area of the state. They receive additional training to remain on the cutting edge of their field. They are encouraged to work with other educators in their region to address local needs in a timely manner. In addition, educators are linked to state specialists in the same discipline to enable the rapid dissemination of new information or the development of appropriate programming to address critical needs. Review by both internal and external bodies is central to this organization's assessment of the merits of the program. That will continue to be a strong emphasis throughout this planning period with the ultimate aim of assessing impacts on science and society.

### **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?**

Throughout the 2012 -2012 period the College of Food, Agricultural, and Environmental Sciences (CFAES), OARDC, and OSU Extension will continue to use a stakeholder based approach in their individual and collective strategic planning exercises and assessments. OARDC and OSU Extension both will maintain advisory committees as well as linkages with county, regional, and statewide groups with whom they liaison for input and guidance. The Vice President, Agriculture also has a variety of advisory committees, as well as interactions with major supporters and commodity, processing, and distribution groups such as the Ohio Farm Bureau and Soybean Council, who provide valuable identification of critical issues. Each group and subgroup is charged with identifying additional stakeholders, committee members, and others who may have a vested interest. To encourage stakeholder input into advancing education, scholarship, knowledge acquisition, and information diffusion into the institution's three signature areas of (1) food security, production, and human health; (2) environmental quality and sustainability; and (3) advanced bioenergy and biobased products, multiple methods are employed. Both OARDC and OSU Extension rely on a layered approach to identifying critical issues and stakeholders. An established strategy within the institution that includes stakeholder input has identified the long-term critical issues related to our joint mission, that of NIFA, and the needs at state, national, and international levels. Faculty and staff have been hired within those areas. Each academic unit has subgroups of stakeholders based on needs for their research and extension programs. These units are also charged with continuing to identify new and emerging needs and associated stakeholder groups.

## **2. How will the planned programs address the needs of under-served and under-represented populations of the State(s)?**

Underserved and underrepresented stakeholder needs will continue to be a major topic at all levels of administration at this institution throughout this 2012 -2016 planning period. This has been reaffirmed in the College of Food, Agricultural, and Environmental Sciences 2008 Strategic Plan, as well as in OSU Extension's 2008 Strategic Plan and OARDC's operational plans. OARDC and OSU Extension have sought and will continue to build linkages with a number of under-served groups such as the Somali community through a fresh goat meat initiative, the Amish through multiple community -based programs, and now provide a number of publications in Spanish. Websites will expand Spanish language sections. OSU Extension and OARDC jointly manage a research, development, and extension center in southern Ohio (South Centers) that is aimed at assisting the economically depressed Appalachia region of Ohio. OARDC is seeking to expand research agreements with some of the 1890 Universities in order to enhance its research effectiveness and to better understand the types of research needed by minority populations that have been extensively served by 1890 programs. Research and extension faculty and staff will continue to be involved in programs such as urban gardening, local fresh foods to local schools, local fresh foods to food banks, and farm markets in urban areas as a means to make fresh food more available to urban populations, many who are underserved. Likewise OARDC and OSU Extension are growing a relationship with a processor of ethnic foods in central Ohio as a means of better servicing the need for ethnic foods. A senior administrator of that group serves on OSU Extension's advisory committee. To address the needs of the underserved and under represented, stakeholders are first identified either by: (a) an overt request for research data or extension publications and /or programs such as a request to aid in enhancing the supply of fresh goat meat for a new immigrant populations; (b) a latent need identified by faculty and staff who work with these populations such as the effectiveness in terms of social stability, economic stability, and preparation for career advancement of daycare provided by grandparents of a rural single working parent; (c) from the literature; (d) a combination of a, b, and c. Based on the needs identified, the institution responds based on its academic and financial capacity to address the need. Priority of the need in relation to other needs of the under-represented and underserved are continually assessed internally. New windows of opportunity continue to open and will be serviced with culturally- relevant, culturally sensitive products and programs. OARDC and OSU Extension have an active, well-supported College - wide Diversity Committee that works to ensure that all faculty, staff, and students within our College understand, appreciate, and respect diversity. OARDC and OSU Extension recognize that the first step in addressing the needs of the under - served and under - represented is to address these matters internally, in turn building a culture of acceptance and appreciation of diversity within our own ranks.

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

OSU Extension and OARDC will continue to evaluate all programs based on outcomes and impacts by assessing new knowledge gained, behavioral changes of clientele, and change actions in practices and resultant products. Programs will describe their expected outcomes as the result of research and extension in terms of economic activity generated, jobs created, new or more commodities and advanced materials, enhanced efficiencies and effectiveness in processing, economic gains/value added, environmental enhancements or surrogate measures where environmental impacts may take decades to be manifested. Results will also be documented in terms of social gains, improvements in health and wellness, food and environmental security programs, as well as other improvements needed within our stakeholders' domain. The outcomes and impacts are expected to have major impacts in Ohio, nationally, and worldwide..... especially as we seek to grow the economy, create jobs, improve food security, reduce world hunger, move more towards energy independence, and

mitigate of the impacts of climate change.

#### **4. How will the planned programs result in improved program effectiveness and/or**

Effectiveness and efficiency will continue to be assessed at all levels of the organization. OSU Extension and OARDC have limited resources and depend heavily on leveraging their base federal funding to attract state funding and competitive grants from extramural sources. In addition to the needs identified by our stakeholders, OARDC and OSU Extension are also focusing on NIFA's national priority areas and the aforementioned Roadmap as a means of helping the institution to target resources for greater efficiency. Continued and enhanced focus on assessing stakeholder needs while assessing the institution's capabilities within mission to meet those needs using base funding, extramural funds, or a combination of both is the first step for program effectiveness. Efficiencies are also gained by predetermining where scarce resources are to be targeted and what impacts are expected based on the inputs allocated. Recently completed strategic plans and external program reviews will continue to provide additional insight into the need - funding- program development- impact model. As economic recovery continues ever so slowly, maximizing effectiveness and efficiency throughout this planning period are critical to success of this reporting institution and perhaps to the long-term well being of agriculture experiment stations and state extension programs nationwide.

### **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 specifically with non-traditional groups
- Survey specifically with non-traditional individuals
- Survey of selected individuals from the general public
- Other (focus groups, public information booths at local gatherings,)

#### **Brief explanation.**

Meaningful stakeholder input is central to this institution's success. Stakeholder input will continue to be a key theme throughout this 2012 -2016 planning period. All colleges at The Ohio State University developed strategic plans in 2008 to address among other points, stakeholder needs. The College of FAES, OSU Extension, and OARDC, jointly, completed a very in-depth strategic plan for the University that is most comprehensive in scope and is heavily vested in stakeholder input. That Strategic Plan will continue to guide program emphasis for the first half of this planning period. As a new Strategic Plan is developed for the latter part of this planning period, the emphasis on stakeholders will be no less. In addition, OSU Extension completed an independent strategic plan over the 2007 - 2008 period that extensively engaged stakeholders at all levels. The Ohio Agricultural Research and Development Center, OSU Extension, and most



academic departments/schools within the College of Food, Agricultural and Environmental Sciences have external advisory committees that meet 2-3 times a year to discuss current programs and provide input for future direction. These activities will continue. All county Extension offices will continue to have an overall advisory committee, as well as focused committees, providing input for program planning, implementation, and evaluation. Every two years, OSU Extension and OARDC involve stakeholders in meeting with state legislators to discuss programmatic priorities and budgetary needs to insure that we are focusing on critical needs of Ohioans. In 2004, 2005, 2007 and 2008, OARDC and/or OSU Extension commissioned Battelle, a private research and development firm, to conduct studies of the economic and social impact of our programs. A Battelle study team interviewed hundreds of stakeholders about the effectiveness of the institution's research and extension programs. The recommendations from the reviews will continue to influence how OARDC and OSU Extension collaborate, and reinforce that identified priority efforts must continue to be based in great part on 21st century needs of Ohio citizens. In addition to the series of Battelle studies, each program area within OSU Extension conducted strategic plans to identify statewide priority programs. The process involved educators meeting with local advisory committees, reviewing data about demographic, economic, and social trends in Ohio, and prioritization processes. As a result, each program area has focused teams composed of campus and center specialists, as well as county educators, who will develop curriculum and evaluation strategies for statewide programs. In many cases, these teams have identified specific target audiences who they regularly involve in evaluating programs and educational materials and engage in planning. Some of the program teams include members from external organizations (statewide agencies, organizations, commodity groups) who are excellent partners for enhancing program outreach and delivery. OSU Extension administration also identified several issues of critical interest to Ohioans based on existing information. These are and will continue to be the focus for interdisciplinary and multidisciplinary programs. Based on funding availability, competitive funding for new programmatic initiatives and partnerships will be made available. County Extension Advisory Committees, as well as the State Extension Advisory Committee, will continue to be engaged in reviewing these proposed programs and prioritizing them as they relate to resources available and community needs.

**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
- Other (one on one interactions with existing and new stakeholders)

**Brief explanation.**

OARDC and OSU Extension have and will continue a history of successfully identifying and linking with stakeholders. The institution will continue to utilize faculty and staff, and associates from support organizations, as well as political leaders, to help identify individuals and groups with whom we should be interacting. These contacts are logged and maintained. As new contacts are made, they are asked as to others who need to be included. Formal needs assessments and targeted surveys, as well as an annual statewide telephone survey, help to identify individuals, groups, issues, and needs. One - on - one sessions at the state

fair, local fairs, and special events, and active participation by faculty and staff in community group processes and in business/professional meetings expand the institution's clientele list and knowledge of needs. These will continue. OARDC and OSU Extension are actively involved in planning and economic development at the county, regional, and statewide levels and will continue to do so throughout this 2012 -2016 planning period. Engagement involves local committee members being identified by the Extension personnel in that county. Local committees are expected to have a constitution and bylaws that identify the makeup of the committee. The membership of committees is reviewed during annual on-site and self-study diversity reviews to insure that involvement is sought from a representative group of local citizens. Educators are encouraged to reach out to new and underserved target audiences to identify specific needs to be addressed. This occurs at the campus level as well and will continue. We have a large research arboretum on each of the two main agriculture campuses, Columbus and Wooster, that attract large numbers of visitors and volunteers annually. These sites are used to help open channels of communications as well as teaching and research laboratories. Following the 2010 tornado that struck the Wooster campus doing substantial damage to that campus' arboretum, public support for helping to restore that arboretum was and continues to be exceptional. This illustrates the value placed on these facilities by stakeholders. Several statewide program teams, such as the Agronomic Crops team, annually conduct program evaluation and needs assessment directly with users of their web based resources to determine what information they need during the growing season and how they want to receive that information. Program evaluations have determined for example that the information delivered in a timely manner from the Crop Observation Reporting Network (CORN). CORN has resulted in an average savings of approximately \$10 million annually in pesticide use. Such feedback is now leading OARDC and Extension to grow their presence on social media. This planning period will see a marked advancement in the use of these new stakeholder relation tools.

**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
- Survey of the general public
- Meeting specifically with non-traditional groups
- Survey specifically with non-traditional groups
- Meeting specifically with non-traditional individuals
- Survey specifically with non-traditional individuals
- Meeting with invited selected individuals from the general public
- Survey of selected individuals from the general public
- Other (focus group interviews, unobtrusive observation, qualitative data)

**Brief explanation.**

Multiple methods will be used in this planning period (2012 -2016) for collecting stakeholder input due to the multiple units and programs engaged in research, extension,

and development. Faculty and staff members, departments and schools, and various other research and extension groups/centers/programs within the institution have stakeholder lists that serve as the foundational list. There are business and industrial partners, fellow research and extension institutions, and support organizations who are part of the list. These are updated regularly. Federal, state, regional, and local governments and agencies, as well as advisory committees and friends groups, commodity groups, and special interest groups add to the list of stakeholders from whom we seek input in the initial planning and execution phases of our programs and who provide both formative and summative assessments of outputs and impacts.

### **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
- Other (Business management practices, culture of organization)

#### **Brief explanation.**

OARDC and OSU Extension are customer centered and stakeholder input will continue to be sought throughout this 2012 -2016 planning period. This is clearly articulated in the CFAES Strategic Plan that guides OARDC and OSU Extension. That plan explicitly calls for stakeholder input at all levels. OARDC and OSU Extension advance both basic and applied research and build and test advanced models for extension programming while meeting their clients' immediate needs. Client needs and their input are critical in the state level budget process and the Plan of Work for federal base funding. Formal and informal inputs are required to meet client needs and in fulfilling the land grant mission. Stakeholder input is critical in building research and extension programs that are impact oriented, that fulfill society's needs, and contribute to national well-being. This input is most critical as we work to grow jobs and strengthen the economy. State, federal, and extramural supporters need to see constituency benefits in order to justify funding decisions. It is the field level interactions with stakeholders in conjunction with sound theory and practice standards that identify the majority of emerging issues. While strong theoretical academic insight is critical, food, agriculture, and environmental issues manifest themselves in field/business locales and in our clients' daily work and social lives. Clients will continue to be true partners with faculty and staff in identifying emerging issues. Issues and needs originating from producers, processors/manufacturers, distributors, and consumers have and will continue to direct and redirect both extension and research programs. It is such issues that provide the scientists with their study questions. Once answered, the response is framed for the clients and other interested parties. The response includes intervention to effect change and assessment of impact. Sharing of new knowledge and adoption techniques using electronic media, including social media, is enhancing utilization of our organization's outputs. These have and will continue to influence faculty and staff hiring, shifts in priorities, resource allocation, and strategic/ action planning. Likewise stakeholder input has and continues to influence how our institution positions itself in the marketplace and conducts business. Stakeholder input

has transformed our corporate culture in that as a public institution, it is imperative for society to see our organization reflecting their aspirations and meeting their needs. As economies continue to struggle this will be more imperative than ever. Input is considered at many levels of the organization. The Administrative Cabinet of OSU Extension reviews input from surveys and strategic planning processes to determine funding and staffing needs. The State Extension Advisory Committee meets 3-4 times a year and provides input on programmatic needs and proposed priorities. Cooperative Extension administrators (Director, Associate Director) and others with statewide program leadership responsibility have initiated a departmental accountability process with all campus units receiving Extension funding. This process involves meetings to discuss shared priorities, surveys of internal and external stakeholders about their satisfaction with the content and expertise delivered from that unit, and review of documented impacts. This process is directly linked to annual funding for the campus departments. Locally, Extension Advisory Committees and other programmatic committees assist educators in prioritizing programs annually. They review information about local needs, capacity of Extension to deliver programs and guide the overall local programmatic vision. The OARDC Advisory Committee is equally as engaged in all aspects from budgeting to agenda setting.

**V. Planned Program Table of Content**

S. No.	PROGRAM NAME
1	Climate Change
2	Sustainable Energy
3	Childhood Obesity
4	Food Safety
5	Global Food Security and Hunger
6	Soil, Air and Water (OARDC Led)
7	Natural Resources and Environmental Systems (OARDC Led)
8	Plants Systems (OARDC Led)
9	Animals Systems (OARDC Led)
10	Food, Agricultural, and Biological Engineering Systems (OARDC Led)
11	Agricultural, Environmental, and Development Economics (OARDC Led)
12	Human Health (OARDC Led)
13	Human and Community Resource Development (OARDC Led)
14	Business Retention and Expansion Initiative (Extension)
15	Dining with Diabetes (Extension)

16	Increasing Profitable Crop Yields Above Trendline-2014 (Extension)
17	New Start for Financial Success (Extension)
18	Real Money, Real World (Extension)
19	Why Trees Matter: Next STEP (Extension)
20	Advancing Employment and Income Opportunities (Extension)
21	Enhancing Agriculture and the Environment (Extension)
22	Preparing Youth for Success (Extension)
23	Strengthening Families & Communities (Extension)

**V(A). Planned Program (Summary)**

**Program # 1**

**1. Name of the Planned Program**

Climate Change

**2. Brief summary about Planned Program**

Climate change threatens sustainable ecosystems and will continue to do so well beyond this 2012 - 2016 planning period. Climate change is one of NIFA's five priority areas as well as a priority in the APLU/ESCOP Science Roadmap for Food and Agriculture. Sustainability is central to the College of Food, Agricultural, and Environmental Sciences 2008 Strategic Plan that focuses on advancing education, scholarship, knowledge acquisition, and information diffusion in three signature areas: (1) food security, production, and human health; (2) environmental quality and sustainability; and (3) advanced bioenergy and biobased products. Climate change impacts each of these areas and all of the Planned Programs reported herein. Achievements within all Planned Programs are dependent to a greater or lesser extent upon stable functioning ecosystems. The understanding the current and potential impacts of climate change are basic for delivering to society a secure supply of food, fiber, other associated products, and related services. Anthropogenic effects, as well as naturally occurring effects on the climate, have potential to threaten that secure supply chain. Likewise these activities provide a basis for extending such knowledge to stakeholders who have participated in defining the need. Scarcity of land and water resources, and the potential threat to both from climate change, demands the investigation of alternative uses and efficiency. This scarcity has major potential to negatively harm global food security, world peace, and stable societies. An example of such integration is OARDC's participation in a new \$20 million grant to 11 universities from USDA-NIFA, that aims to keep Midwest corn-based cropping systems resilient in the face of future climate uncertainties.

**3. Program existence :** Intermediate (One to 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
132	Weather and Climate	80%		25%	
133	Pollution Prevention and Mitigation	10%		65%	
605	Natural Resource and Environmental Economics	10%		10%	
	<b>Total</b>	100%		100%	

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

1. Situation and priorities

OSU Extension and OARDC generate extension and research programs to inform an agriculture system that maintains high productivity in the face of climate change. Likewise the programs support parallel natural resource and environmental programs. These programs will help producers to plan for and make decisions to adapt to changing environments and sustain economic vitality, and can take advantage of emerging economic opportunities offered by climate change mitigation technologies. OARDC and OSU Extension's role, in partnership with other research and outreach organizations such as Battelle, is to inform the process. This line of research by agricultural experiment stations and companion extension programs are mandatory to meet domestic demand to reduce and/or mitigate the impacts from the anthropogenic effects of climate change. Such research directly supports OARDC and OSU Extension's broader goals of production efficiency, economic viability, environmental stewardship, and social acceptability of technologies and products introduced. OARDC and OSU Extension address direct needs of all their constituency groups by regularly interacting with them and understanding their needs.

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

Climate change research is a client-oriented program designed to meet society's overt and latent needs for information and solutions. Given the political nature of this topic and the multiple predictive models, an unbiased science research and extension program is required. As we address problems and needs within our stakeholder communities, the organization (OARDC and OSU Extension) becomes better prepared to take advantage of emerging opportunities and more rapidly address problems within these

areas. Other key assumptions are: the issues within this program have been identified by our stakeholder business partners, and/or via a growing body of scientific literature, reflect the more important issues in terms of priorities of stakeholders, and warrants allocation of resources; the understanding of this planned program and how society utilizes and depends on the associated research is key to present and future decision-making in provisioning of alternatives in the face of climate change; all citizens directly benefit from this program; the effort is supported by an advanced research and extension program; these lines of inquiry are necessary to inform human enterprises; research and extension education in this program are demanded by society and required to meet current and future needs of society; and base federal funding will continue to be available and leveraged to support this planned program and the scientific staff who carry out the lines of inquiry noted within the knowledge areas for this program. Likewise it is assumed that the federal base funding will be leverage for continuing to attract state and extramural funds.

**2. Ultimate goal(s) of this Program**

OSU Extension and OARDC's ultimate goal for this Program for the 2012 -2016 Planning Period is to generate programs to develop an agriculture system that maintains high productivity in the face of climate change. This Planned Program is designed to contribute to the biological, chemical, physical, engineering, economic, and social research necessary to build a system for sustainable in the face of climate change. If the climate continues to shift in Ohio, then new varieties will need to be developed to not only cope with overall warming but also with greater temperature and moisture extremes as some models predict. OSU Extension and OARDC, through the creation of partnership networks that involve stakeholders, will continue to meet societies growing demand for science based answers to climate change related to food, agricultural, and environmental sciences enterprises.

**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
2012	2.0	0.0	1.0	0.0
2013	2.0	0.0	1.0	0.0
2014	2.0	0.0	1.0	0.0
2015	2.0	0.0	1.0	0.0
2016	2.0	0.0	1.0	0.0

**V(F). Planned Program (Activity)**

**1. Activity for the Program**

On -going research activities related to climate change include both basic and applied research. This research takes place in all academic departments/schools within the College of Food, Agricultural, and Environmental Sciences. Laboratories for experiments, pilot plants, a feedstock processing plant, greenhouses, and research plots and stations support this program. All functional laboratories and sites are improved over time as program need warrants. OSU Extension provides parallel programs in this Planned Program to advance knowledge, promote adoption and change, and develop human capital. OARDC and OSU Extension faculty and staff engage in appropriate levels of outreach, engagement, and consultation, with both internal and external stakeholders.

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

**Extension**

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> <li>● Education Class</li> <li>● Workshop</li> <li>● Group Discussion</li> <li>● Demonstrations</li> </ul>	<ul style="list-style-type: none"> <li>● Public Service Announcement</li> <li>● Newsletters</li> <li>● TV Media Programs</li> <li>● Web sites other than eXtension</li> <li>● Other 1 (Factsheets)</li> <li>● Other 2 (Webinars)</li> </ul>

**3. Description of targeted audience**

In the Climate Change Planned Program, targeted audiences include, but are not limited to: business and industry that have expressed a need for climate change information that is derived through new research, extracted from on-going research, or is derived from scientific literature; other stakeholders; fellow academic units that partner with program scientists to create systems and processes needed to support not only the research, but also the adoption of the research findings by industrial partners; fellow agencies or support organizations who will not only use the information but will also be brokers of that information, including embedding it into groups to encourage change; populations who have not requested the information but will likely benefit from that information, e.g. general public; other scientists and scientific groups; political entities; other education, outreach, and extension personnel; students from elementary school to post doctorate studies; and news organizations.

**V(G). Planned Program (Outputs)**

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
  - Direct Adult Contacts
  - Indirect Adult Contacts
  - Direct Youth Contacts
  - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.



## **V(H). State Defined Outputs**

### **1. Output Measure**

- Number of Graduate Students Completed
- Number of participants attending educational programs of one teaching hour or more.
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

**V(I). State Defined Outcome**

O. No	Outcome Name
1	Advance the understanding of soil carbon sequestration research to the point that Ohio farmers can enter the carbon trading market.
2	Create strategies/technologies within our program mission to reduce atmospheric pollution that can contribute to global climate change.
3	Number of producers adopting methane recovery systems.
4	Number of animal units affected by methane recovery systems.
5	Number of producers using no-till techniques to sequester carbon in the soil.

**Outcome # 1**

**1. Outcome Target**

Advance the understanding of soil carbon sequestration research to the point that Ohio farmers can enter the carbon trading market.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:0                      2013:1                      2014:0                      2015:0                      2016:0**

**3. Associated Knowledge Area(s)**

- 133 - Pollution Prevention and Mitigation

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 2**

**1. Outcome Target**

Create strategies/technologies within our program mission to reduce atmospheric pollution that can contribute to global climate change.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:1                      2013:0                      2014:0                      2015:1                      2016:1**

**3. Associated Knowledge Area(s)**

- 132 - Weather and Climate
- 133 - Pollution Prevention and Mitigation

**4. Associated Institute Type(s)**

- 1862 Extension
- 1862 Research

**Outcome # 3**

**1. Outcome Target**

Number of producers adopting methane recovery systems.

**2. Outcome Type : Change in Condition Outcome Measure**

**2012:2                      2013:3                      2014:3                      2015:3                      2016:5**

**3. Associated Knowledge Area(s)**

- 132 - Weather and Climate
- 133 - Pollution Prevention and Mitigation

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 4**

**1. Outcome Target**

Number of animal units affected by methane recovery systems.

**2. Outcome Type : Change in Condition Outcome Measure**

**2012:100                      2013:100                      2014:100                      2015:100                      2016:100**

**3. Associated Knowledge Area(s)**

- 132 - Weather and Climate
- 133 - Pollution Prevention and Mitigation
- 605 - Natural Resource and Environmental Economics

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 5**

**1. Outcome Target**

Number of producers using no-till techniques to sequester carbon in the soil.

**2. Outcome Type : Change in Action Outcome Measure**

**2012:50                      2013:50                      2014:50                      2015:50                      2016:50**

**3. Associated Knowledge Area(s)**

- 133 - Pollution Prevention and Mitigation
- 605 - Natural Resource and Environmental Economics

#### **4. Associated Institute Type(s)**

- 1862 Extension

### **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
- Other (Social Acceptance of the issue)

#### **Description**

Climate change is a multi-dimensional, political, and socially debated topic, thus the shift in any or all of these affect outcomes. Climatic extremes, coupled with pest and diseases that are often climate related, can impact outcomes. As the food, fiber, and environmental economy adjust to the global climate change, there will be other confounding changes in public policy, environmental regulations, demand for action/inaction, new predictive models, and a lack of worldwide consensus on how to respond/react/lead. Formative evaluation though can lessen the burden by seeking feedback throughout the life of the program. Internal factors such as the availability of base funding to ensure a core faculty and staff, availability of extramural funds, availability of competitive funds, and programmatic demands that often exceed resources, all may affect outcomes.

### **V(K). Planned Program - Planned Evaluation Studies**

#### **Description of Planned Evaluation Studies**

{NO DATA ENTERED}

## **V(A). Planned Program (Summary)**

### **Program # 2**

#### **1. Name of the Planned Program**

Sustainable Energy

#### **2. Brief summary about Planned Program**

The United States is highly dependent on crude oil imports to supplement its domestic sources for the creation of energy and other petroleum-based products. This dependency is projected well beyond the end of this planning period in 2012. Energy independence continues to be a primary national concern. NIFA now lists this area as one of its five priority areas as does the APLU/ESCOP Science Roadmap for Food and Agriculture. OARDC and OSU Extension can contribute to this priority area and the nation's move towards greater energy independence. Our nation has become one of the most prosperous in the world in great part because of its ability to utilize its natural resource base to build the economy as the nation expanded from east to west. As the nation grew, so did the quantity, quality, and efficiency of agricultural output, feeding the domestic population and then the world. Food, agriculture, and natural resources continue to underpin national well-being. At the same time though, food and traditional fiber crops alone do not take full advantage of the economic and social good opportunities that are available to agriculture and natural resource stakeholders. To that end, OARDC and OSU Extension, and multiple partners, are exploring new opportunities for adding value to biobased products, beyond traditional food and fiber markets, through commercialization of new products in the form of sustainable energy and advanced materials. This Planned Program is one of three signature areas identified in the College of Food, Agricultural and Environmental Science 2008 Strategic Plan. Due to the rising costs of crude oil and the eventuality of declining supplies of crude oil, biobased substitutes for petroleum based energy and other products are in demand, as are other forms of sustainable energy. Two major thrust areas are now being advanced- biobased fuels and biopolymer type products. Ohio's biomass, rich in agricultural, plant fiber, and food-processing wastes, is capable of producing a large part of Ohio's residential electricity needs. In an effort to harness the power of the state's abundant biomass and provide alternatives to record-high energy prices, OARDC is establishing a pioneering bio-energy research facility on its Wooster, Ohio campus. Funded by public and private monies, the facility's aim is to optimize different technologies, such as anaerobic digestion and fuel cells, for the biological conversion of biomass into scalable energy systems. The facility will also offer an industrial testing platform to verify the energy potential of various wastes from different industries. OARDC and OSU Extension efforts also inform ethanol development programs. Additionally, OARDC, OSU Extension, and their external partners have created the Ohio BioProducts Innovation Center (OBIC). OBIC is developing/identifying bio-resource materials and chemical conversion technologies to generate industrial products such as lubricants and adhesives from raw materials grown in the state, including corn and soybeans. Combining development of unique germplasms with novel chemical-synthesis technologies, oils, carbohydrates, and proteins will produce specialty chemicals targeted for use in a range of advanced bioproduct applications. Ultimately, OBIC's 'cell-to-sell' management plan links Ohio's research and commercial partners to focus academic research on market-based problems identified by business partners, which in turn lead to the commercialization of high-value industrial bioproducts and manufacturing solutions. Given that the global petrochemical industry is approximately 2 trillion annually, and biobased products will continue to fill the gaps in this market, as well as create new markets. Also given the demand by producers, industry and consumers, and the breadth of partnerships already established, biobased research to generate sustainable energy and advanced materials is expected to be a major long-term research and outreach foci in Ohio and at OARDC. Combining Ohio's largest industry, food and agriculture, with Ohio's second largest industry, polymers, to take advantage of new industrial platforms in biobased research and manufacturing will yield substantial economic activity and job creation, as well as contribute to a lessened dependency on foreign crude oil. Thus this program is central to the College of Food, Agricultural, and

Environmental Sciences 2008 Strategic Plan that focuses on advancing education, scholarship, knowledge acquisition, and information diffusion in three signature areas: (1) food security, production, and human health; (2) environmental quality and sustainability; and (3) advanced bioenergy and biobased products.

**3. Program existence :** Intermediate (One to 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
511	New and Improved Non-Food Products and Processes	30%		90%	
608	Community Resource Planning and Development	70%		10%	
	<b>Total</b>	100%		100%	

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

**1. Situation and priorities**

Demand for alternative and value-added uses for Ohio's renewable bio-based resources and organic waste streams is strong. OARDC and OSU Extension's role, in partnership with other research and outreach organizations such as Battelle, is to inform the process. This line of research by agricultural experiment stations and companion extension programs nationwide are mandatory to meet domestic demand for new and innovative sources of sustainable energy. Such research directly supports OARDC and OSU Extension's broader goals of production efficiency, economic viability, environmental stewardship, and social acceptability of technologies and products introduced. OSU Extension and OARDC address direct needs of all their constituency groups by regularly interacting with them and understanding their needs. Scientists working in bio-based (advanced materials) products have formed strong partnerships with industry to ensure that research informs development of commercialized products and processes that are in demand by consumer groups. Job growth is also most important. Without a growing body of knowledge in this area to create plentiful supply of sustainable energy and advanced materials while creating jobs and new industries, opportunities will be missed and society will not be well served. With a growing body of literature, and a well-developed network of industrial partners, clientele, supporters, and companion agencies and organizations, OSU Extension and OARDC are well-positioned to continue to affect positive change in adding value through these well-planned research and extension programs.

**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**

Sustainable energy and advanced materials research is a client-oriented program designed to meet society's overt and latent needs for alternative (advanced) energy and biobased products in a sustainable manner. As we address problems and needs within our stakeholder communities, the organization (OARDC and OSU Extension) become better prepared to take advantage of emerging opportunities or to more rapidly address problems within these areas. Other key assumptions are: the issues within this program have been identified by our stakeholder/business partners and other clientele, and/or via a growing body of scientific literature; these reflect the more important issues in terms of priorities among stakeholders, and warrants allocation of resources; the understanding of this planned program and how society utilizes and depends on the associated research is key to present and future decision-making in provisioning of alternatives for some petroleum-based products; all citizens directly benefit from a secure and plentiful supply of non-petroleum based products and processes this program will generate; the program is supported by an advanced research and extension program and is required for commercialized products to emerge; these lines of inquiry are necessary to inform human enterprises; research and extension education in this program are demanded by society and required to meet current and future needs of society, especially as we move towards energy independence and as crude oil reserves decline; and base federal funding will continue to be available and leveraged to support this Planned Program and the scientific staff who carry out the lines of inquiry noted within the knowledge area for this program. Likewise it is assumed that the federal base funding will be leverage for continuing to attract state and extramural funds.

### **2. Ultimate goal(s) of this Program**

Goals in this planned program are designed to participate in providing the biological, chemical, physical, engineering, and social research and extension programming necessary to build a system for sustainable energy and advanced materials primarily from, but not limited to, biobased natural resources and from organic waste streams: through the creation of partnership networks that involves all stakeholders at the appropriate point in the process(value chain) necessary to make these research efforts true partnerships with fully vested partners; to meet societies growing demand for alternatives to petroleum based products where demand and economic and technological realities warrant; to meet yet undetermined needs of society as crude oil and natural gas supplies decline; to effectively utilize Ohio and the region's plentiful supply of biomass, including waste stream materials that has conversion potential; and that effectively utilizes agriculture's production capacity to produce plants that have the desired attributes required by new biobased industries for manufacturing alternative products. Research and extension impacts towards the goal of energy independence are reported in this Planned Program with an emphasis on developing biomass use for biofuels, designing optimum forestry and crops for bioenergy production, other advanced energy initiatives, and to produce value-added biobased/advanced industrial products.

## **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
2012	2.0	0.0	3.5	0.0
2013	2.0	0.0	3.5	0.0
2014	2.0	0.0	3.5	0.0
2015	3.0	0.0	3.5	0.0
2016	3.5	0.0	3.5	0.0

**V(F). Planned Program (Activity)**

**1. Activity for the Program**

On -going research activities to inform sustainable energy and advanced materials programs include both basic and applied research. This research takes place in all academic departments/schools within the College of Food, Agricultural, and Environmental Sciences. Laboratories for experiments, pilot plants, a feedstock processing plant, greenhouses, and research plots and stations support this program. All functional laboratories and sites are improved over time as program need warrants. OSU Extension provides parallel programs in this Planned Program to advance knowledge, promote adoption and change, develop human capital, and support economic development activities. OARDC and OSU Extension faculty and staff engage in appropriate levels of outreach, engagement, and consultation, with both internal and external stakeholders, to insure the research has the greatest chance of effecting change within society.

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

**Extension**

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> <li>● Education Class</li> <li>● Workshop</li> <li>● Group Discussion</li> <li>● Demonstrations</li> </ul>	<ul style="list-style-type: none"> <li>● Public Service Announcement</li> <li>● Newsletters</li> <li>● Web sites other than eXtension</li> <li>● Other 1 (Factsheets)</li> </ul>

**3. Description of targeted audience**

Targeted audiences include, but are not limited to: business, industry, and residents that have expressed a need for sustainable energy and advanced materials information that is derived through new research, extracted from on-going research, or is derived from scientific literature; other stakeholders, with particular focus on consumers; fellow academic units that partner with program scientists to create systems and processes needed to support not only the research, but also the adoption of the research findings by industrial partners; fellow agencies or support organizations who will not only use the information but will also be brokers of that information, including embedding it into groups to encourage change; populations who have not requested the information but will likely benefit from that information, e.g. community leaders, general public; other scientists and scientific groups; political entities; other education, outreach, and extension personnel; students from elementary school to post doctorate studies; and news organizations.

## **V(G). Planned Program (Outputs)**

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
    - Direct Adult Contacts
    - Indirect Adult Contacts
    - Direct Youth Contacts
    - Indirect Youth Contact
  - Number of patents submitted
  - Number of peer reviewed publications
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

## **V(H). State Defined Outputs**

### **1. Output Measure**

- Number of graduate students completed.
  - Educational Workshops and Seminars
  - Research based assessments of energy project sites
  - Community energy project assistance & planning
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

**V(I). State Defined Outcome**

O. No	Outcome Name
1	Programs in this area will develop strategies to engage producers, industrial partners, and consumers groups over a 5-year period resulting in effective leadership-oriented partnerships.
2	The program will build scientist/stakeholder cores to guide/provide biological, chemical, physical, engineering, and social research necessary to create new and improved processes and products commensurate with demand.
3	Annually the program will report, in conjunction with industrial partners, non-proprietary research gains made to the consuming public to garner interest in adoption of new products and processes when released.
4	Maintain an ongoing needs assessment program to identify yet to be determined needs of society for bio-based products as crude oil and natural gas supplies decline, as well as assessing impacts from other external factors.
5	By 2012, the program will contribute at least one alternative to a petroleum-based product or process that meets client needs with an acceptable point of purchase price.
6	Support, through research, the building of biobased development that annually, beginning in 2012, utilizes Ohio and the region's plentiful supply of biomass, including waste steam materials in such manner as to improve the economy.
7	Support the building of biobased development that, beginning in 2012, effectively utilizes agriculture's production capacity to produce plants that have the desired attributes for manufacturing.
8	Increased understanding of energy alternatives, resources and project support
9	Implement change in energy usage by workshop participants
10	Complete installation of alternative energy activity
11	Complete plan for community or business energy activity

**Outcome # 1**

**1. Outcome Target**

Programs in this area will develop strategies to engage producers, industrial partners, and consumers groups over a 5-year period resulting in effective leadership-oriented partnerships.

**2. Outcome Type : Change in Action Outcome Measure**

**2012:1                      2013:1                      2014:0                      2015:0                      2016:0**

**3. Associated Knowledge Area(s)**

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

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 2**

**1. Outcome Target**

The program will build scientist/stakeholder cores to guide/provide biological, chemical, physical, engineering, and social research necessary to create new and improved processes and products commensurate with demand.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:1                      2013:0                      2014:0                      2015:1                      2016:0**

**3. Associated Knowledge Area(s)**

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

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 3**

**1. Outcome Target**

Annually the program will report, in conjunction with industrial partners, non-proprietary research gains made to the consuming public to garner interest in adoption of new products and processes when released.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:1                      2013:1                      2014:1                      2015:1                      2016:0**

**3. Associated Knowledge Area(s)**

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

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 4**

**1. Outcome Target**

Maintain an ongoing needs assessment program to identify yet to be determined needs of society for bio-based products as crude oil and natural gas supplies decline, as well as assessing impacts from other external factors.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:0                      2013:1                      2014:0                      2015:0                      2016:0**

**3. Associated Knowledge Area(s)**

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

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 5**

**1. Outcome Target**

By 2012, the program will contribute at least one alternative to a petroleum-based product or process that meets client needs with an acceptable point of purchase price.

**2. Outcome Type : Change in Action Outcome Measure**

**2012:0                      2013:0                      2014:0                      2015:0                      2016:0**

**3. Associated Knowledge Area(s)**

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

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 6**

**1. Outcome Target**

Support, through research, the building of biobased development that annually, beginning in 2012, utilizes Ohio and the region's plentiful supply of biomass, including waste steam materials in such manner as to improve the economy.

**2. Outcome Type : Change in Action Outcome Measure**

<b>2012:1</b>	<b>2013:1</b>	<b>2014:1</b>	<b>2015:1</b>	<b>2016:0</b>
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**3. Associated Knowledge Area(s)**

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

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 7**

**1. Outcome Target**

Support the building of biobased development that, beginning in 2012, effectively utilizes agriculture's production capacity to produce plants that have the desired attributes for manufacturing.

**2. Outcome Type : Change in Knowledge Outcome Measure**

<b>2012:1</b>	<b>2013:0</b>	<b>2014:1</b>	<b>2015:0</b>	<b>2016:0</b>
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**3. Associated Knowledge Area(s)**

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

**4. Associated Institute Type(s)**

- 1862 Extension
- 1862 Research

**Outcome # 8**

**1. Outcome Target**

Increased understanding of energy alternatives, resources and project support

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:300                      2013:350                      2014:250                      2015:200                      2016:200**

**3. Associated Knowledge Area(s)**

- 608 - Community Resource Planning and Development

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 9**

**1. Outcome Target**

Implement change in energy usage by workshop participants

**2. Outcome Type : Change in Action Outcome Measure**

**2012:125                      2013:150                      2014:125                      2015:100                      2016:100**

**3. Associated Knowledge Area(s)**

- 511 - New and Improved Non-Food Products and Processes
- 608 - Community Resource Planning and Development

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 10**

**1. Outcome Target**

Complete installation of alternative energy activity

**2. Outcome Type : Change in Condition Outcome Measure**

**2012:3                      2013:6                      2014:9                      2015:12                      2016:20**

**3. Associated Knowledge Area(s)**

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

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 11**

**1. Outcome Target**

Complete plan for community or business energy activity

**2. Outcome Type : Change in Condition Outcome Measure**

**2012:6                      2013:9                      2014:12                      2015:15                      2016:10**

**3. Associated Knowledge Area(s)**

- 608 - Community Resource Planning and Development

**4. Associated Institute Type(s)**

- 1862 Extension

**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.)
- Other (Supply and cost of crude oil)

**Description**



Supply, costs, transportation costs/impacts, and demand for petroleum products, and shifting projections of world reserves of crude oil and natural gas, as well as U.S. access to these, are critical external factors. Availability of biobased raw products in Ohio, and regionally, and at what costs, economic, social and environmental costs, are external factors. Economic shifts such as cost of processing equipment or production costs, public policy shifts, regulations, and shifts in demand will be impact outcomes. Product trends/fades, advertising agendas, and public perceptions, to areas such as to petroleum reserves, are also external factors that effect outcomes. Factors such as the availability of base funding to ensure a core faculty and staff, availability of extramural funds, and programmatic demands that often exceed resources, all will affect outcomes.

## **V(K). Planned Program - Planned Evaluation Studies**

### **Description of Planned Evaluation Studies**

{NO DATA ENTERED}

**V(A). Planned Program (Summary)**

**Program # 3**

**1. Name of the Planned Program**

Childhood Obesity

**2. Brief summary about Planned Program**

Obesity is of major importance for societal well - being and is a concern from both society's perspective and from a research - extension perspective. NIFA lists this as one of its five priority areas as does the APLU/ESCOP Science Roadmap for Food and Agriculture. This will remain a priority for OARDC and OSU Extension for this 2012 -2016 planning period and more than likely well beyond, given the societal and personal costs/impacts of obesity. The food plants and animals we grow, process, and provide for consumption have human health issues associated with them. This Planned Program is central to the College of Food, Agricultural, and Environmental Sciences 2008 Strategic Plan and is encompassed in the first signature area of that plan. That plan focuses on advancing education, scholarship, knowledge acquisition, and information diffusion in three signature areas: (1) food security, production, and human health; (2) environmental quality and sustainability; and (3) advanced bioenergy and biobased products. This Planned Program is focused, through research and extension programming, on reducing threats to human health from obesity. While the program is not large, it is of important to both the research and extension portfolios, and is funded by both OARDC and OSU Extension in two colleges. Given that obesity is linked to multiple areas reported throughout this POW, outcomes and impacts affecting obesity will occur in Planned Programs other than this one.

**3. Program existence :** Intermediate (One to 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	0%		80%	
703	Nutrition Education and Behavior	0%		10%	
724	Healthy Lifestyle	0%		10%	
	<b>Total</b>	0%		100%	

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

**1. Situation and priorities**

American society is characterized by environments that promote increased food intake, nonhealthful foods, and physical inactivity according to the US Center for Disease Control (CDC). More than one third

of U.S. adults, 72 +million peopleincluding 16% of U.S. children are obese. Obesity rates for adults have doubled and rates for children have tripled in the last three decades. Obesity rates among all groups in society, irrespective of age, sex, race, ethnicity, socioeconomic status, education level, or geographic region, have increased markedly according to the CDC. While obesity affects all populations in the US, according to the CDC, the underserved are most impacted with Blacks having 51 percent higher prevalence of obesity when compared to whites, and Hispanics had 21 percent higher obesity prevalence in the same comparison. Childhood obesity is considered epidemic by many experts. Obesity has physical, psychological, and social consequences in adults and children. Obesity is related to diabetes and problems such as poor self-esteem. Children and adolescents are developing obesity-related diseases, such as type 2 diabetes, that were once seen only in adults. Obese children are more likely to have risk factors for cardiovascular disease, including high cholesterol levels, high blood pressure, and abnormal glucose tolerance according to the CDC. One study of 5- to 17-year-olds found that 70% of obese children had at least one risk factor for cardiovascular disease and 39% of obese children had at least two risk factors. Obesity is a major economic burden on the US health care system. In 2000, obesity-related health care costs totaled an estimated \$117 billion. Between 1987 and 2001, diseases associated with obesity accounted for 27% of the increases in medical costs. Medical expenditures for obese workers, depending on severity of obesity and sex, are between 29% and 117% greater than expenditures for workers with normal weight. From 1979 to 1999, annual hospital costs related to obesity among children and adolescents increased, rising from \$35 million to \$127 million(data from CDC). Research can provide science based solutions for healthier foods and lifestyles and extension education can help individuals adopt healthy eating and physical activity behaviors that are the keys to preventing obesity. To that end OARDC and OSU Extension are dedicated.

## **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**

OSU Extension and OARDC support a client oriented research and extension activities related to obesity. As we address problems and needs within our stakeholder communities, the organizations (OARDC and OSU Extension) become better prepared to take advantage of emerging opportunities or to more rapidly address problems related to obesity. Key assumptions are: the issues within this program have been identified by our stakeholder communities, and/or via the scientific literature, reflect society's more important issues, and warrant allocation of resources; the understanding of this planned program and how society utilizes and depends on the associated research and extension programs are key to present and future decision-making regarding obesity; all citizens directly benefit from a healthy lifestyle supported by an advanced research and extension program; these lines of inquiry will provide necessary knowledge to inform human enterprises; obesity - related research and extension education are demands by society to meet current and future needs; and base federal funding will continue to be available and leverage for extramural grants to support this Planned Program and the scientific staff who carry out these lines of inquiry. Likewise it is assumed that the federal base funding will be leverage for continuing to

attract state and extamural funds.

**2. Ultimate goal(s) of this Program**

OARDC and OSU Extension ultimate goal is to conduct research that supports programs that reduce obesity by providing science - based information so that individuals and families are able to make informed decisions about their health and well-being.

**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
2012	20.0	0.0	1.0	0.0
2013	20.0	0.0	1.0	0.0
2014	20.0	0.0	1.0	0.0
2015	20.0	0.0	1.0	0.0
2016	0.0	0.0	1.0	0.0

**V(F). Planned Program (Activity)**

**1. Activity for the Program**

Obesity research includes food science, plant sciences, and consumer research related to human health and obesity. Parallel extension programs that address health and wellness, life styles, and consumer choice are included in this Planned Program as well. Given the complex nature of obesity as a subject, the areas is broadly supported in scientific areas ranging from genetics for breeding plants and animals that can be processed into healthier food products, to education of school children about eating healthy. Thus not all impacts relating to obesity, per se, are found in this Planned Program. OARDC and OSU Extension advance programs that ensures nutritious foods are affordable and available, and provide guidance so that individuals and families are able to make informed, science-based decisions about their health and well-being.

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

**Extension**

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> <li>● Education Class</li> <li>● Workshop</li> <li>● Group Discussion</li> <li>● Demonstrations</li> <li>● Other 1 (One-on-one Education)</li> </ul>	<ul style="list-style-type: none"> <li>● Public Service Announcement</li> <li>● Newsletters</li> </ul>

### 3. Description of targeted audience

Within the Childhood Obesity Planned Program targeted audiences include, but not limited to: specific individuals, families, and groups who have an expressed a need, or where there are latent needs, for related research and extension information that is to be derived through new research, extracted from on-going research, or is derived from scientific literature; fellow academic units that partner with OARDC and OSU Extension to support not only the research, but also the adoption of the research findings by stakeholders; fellow agencies or support organizations who will not only use the information but will also be brokers of that information, including embedding it into groups to encourage change; populations who have not requested the information but will likely benefit from that information, e.g. obese children; other scientists and scientific groups; political entities; school administrators; students from pre-school to post doctorate studies; news organizations; and business and industrial groups concerned about obesity in their workforce or who are producers of foods and food additives that can help reduce obesity and its side effects.

### V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
  - Direct Adult Contacts
  - Indirect Adult Contacts
  - Direct Youth Contacts
  - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

### V(H). State Defined Outputs

#### 1. Output Measure

- Number of graduate students competed
- number of educational sessions held

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

**V(I). State Defined Outcome**

O. No	Outcome Name
1	To better understand human decision making; specifically with reference to how individuals make food consumption decisions.
2	Apply new knowledge to programs at the field level with a goal of significant long term weight loss and overall improvement of health in those who participate.
3	To identify research activities such as new data sources, improved techniques for data analysis, and improved hypotheses for obesity research questions.
4	Advance extension activities ranging from how to provide policymakers better insight about how to help individuals overcome their inability to adhere to weight-loss plans to impacts on individual and groups' lives, both in terms of weight loss and in overall improvements in health.
5	Number of participants who learned new information from this program. (OSUE)
6	Number of participants who plan to increase their level of daily physical activity. (OSUE)
7	Number of participants who plan to increase their consumption of fruits and vegetables. (OSUE)

**Outcome # 1**

**1. Outcome Target**

To better understand human decision making; specifically with reference to how individuals make food consumption decisions.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:1                      2013:1                      2014:0                      2015:1                      2016:0**

**3. Associated Knowledge Area(s)**

- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 724 - Healthy Lifestyle

**4. Associated Institute Type(s)**

- 1862 Extension
- 1862 Research

**Outcome # 2**

**1. Outcome Target**

Apply new knowledge to programs at the field level with a goal of significant long term weight loss and overall improvement of health in those who participate.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:0                      2013:1                      2014:0                      2015:1                      2016:0**

**3. Associated Knowledge Area(s)**

- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 724 - Healthy Lifestyle

**4. Associated Institute Type(s)**

- 1862 Extension
- 1862 Research

**Outcome # 3**

**1. Outcome Target**

To identify research activities such as new data sources, improved techniques for data analysis, and improved hypotheses for obesity research questions.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:1                      2013:0                      2014:1                      2015:0                      2016:0**

**3. Associated Knowledge Area(s)**

- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 724 - Healthy Lifestyle

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 4**

**1. Outcome Target**

Advance extension activities ranging from how to provide policymakers better insight about how to help individuals overcome their inability to adhere to weight-loss plans to impacts on individual and groups' lives, both in terms of weight loss and in overall improvements in health.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:0                      2013:0                      2014:0                      2015:0                      2016:0**

**3. Associated Knowledge Area(s)**

- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 724 - Healthy Lifestyle

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 5**

**1. Outcome Target**

Number of participants who learned new information from this program. (OSUE)



**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:4500                      2013:4500                      2014:4500                      2015:4500                      2016:5000**

**3. Associated Knowledge Area(s)**

- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 724 - Healthy Lifestyle

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 6**

**1. Outcome Target**

Number of participants who plan to increase their level of daily physical activity. (OSUE)

**2. Outcome Type : Change in Action Outcome Measure**

**2012:1500                      2013:1500                      2014:1500                      2015:1500                      2016:2500**

**3. Associated Knowledge Area(s)**

- 724 - Healthy Lifestyle

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 7**

**1. Outcome Target**

Number of participants who plan to increase their consumption of fruits and vegetables. (OSUE)

**2. Outcome Type : Change in Action Outcome Measure**

**2012:4500                      2013:4500                      2014:4500                      2015:4500                      2016:2500**

**3. Associated Knowledge Area(s)**

- 703 - Nutrition Education and Behavior
- 724 - Healthy Lifestyle

#### 4. Associated Institute Type(s)

- 1862 Extension

### 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.)
- Other (Support in schools for programs )

#### Description

Shifts in economy impact all aspects of peoples lives, psychologically, socially, and physically, including obesity. Within this program area public monies, and the fluctuations in appropriations of such, have dramatic (both positive and negative) affect on human well-being, as do levels of government support for obesity education. Likewise public policy and the publics' priorities and perceptions, including popular culture and trends/fads, are major external factors impacting this program, as well as people's food and lifestyle choices. Priority of social science research for limited dollars, and the resulting competition, impact the extent that research can be carried out. Other factors such as migrant populations entering the community and workforce, or new populations who have recently immigrated into the area, and are ill-prepared to sustain themselves to the extent they can purchase healthy foods and/or have access to public education/assistance programs that promote healthy eating and lifestyle choices. Learning styles, disabilities, ones background/ education, social status, and similar effect one'e eating habits and lifestyle choices. These can also affect how one learns and how they will use any new knowledge gained. Often, individuals traits are well inculcated into that individuals psyche and behavior and change is slow. Factors such as the availability of base funding to ensure a core faculty and staff, availability of extramural funds, and programmatic demands that often exceed resources, will affect outcomes.

### V(K). Planned Program - Planned Evaluation Studies

#### Description of Planned Evaluation Studies

{NO DATA ENTERED}

## **V(A). Planned Program (Summary)**

### **Program # 4**

#### **1. Name of the Planned Program**

Food Safety

#### **2. Brief summary about Planned Program**

Food safety, one of NIFA's five priority areas, is a major concern locally, nationally, and throughout the world. Likewise food safety is embedded in the APLU/ESCOP Science Roadmap for Food and Agriculture array of priorities. OARDC and OSU Extension lead programs that advance food preservation and protect against pathogens. Due to the complexity of food systems, a robust research and extension program is required to meet societal needs for a safe food supply. As an example, OARDC has received a 2010 \$2 million grant from NIFA to improve disease control and food safety in the country's multi-million dollar greenhouse tomato industry -- which now accounts for nearly 40 percent of all fresh tomatoes sold in American supermarkets. In a 2010 -2014, \$1 million study, OSU scientists will leading an additional effort aimed at reducing the incidence of foodborne illness in fresh produce caused by viruses.

Viruses, including human norovirus, hepatitis A virus and rotavirus, account for more than two out of three foodborne illnesses worldwide. Yet most research and nearly all education about foodborne illness focuses on bacteria, such as *Salmonella*, *E. coli*, *Listeria* and *Campylobacter*. Impacts from these new grants and parallel work will be reflected in this planning period. As we enter this 2012 - 2016 planning period, Food Safety is and will continue to be a high priority research and extension program at OSU. This is reflected in and is central to the College of Food, Agricultural, and Environmental Sciences 2008 Strategic Plan that focuses on advancing education, scholarship, knowledge acquisition, and information diffusion in three signature areas : (1) food security, production, and human health; (2) environmental quality and sustainability; and (3) advanced bioenergy and biobased products. Out of integrated research and extension programs in CFAES signature area one --food security, production, and human health -- come science-based findings and extension strategies to inform national and global food safety programs.

**3. Program existence** : Mature (More than 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
703	Nutrition Education and Behavior	100%		10%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	0%		90%	
	<b>Total</b>	100%		100%	

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

**1. Situation and priorities**

Food safety programs work to reduce the incidence of foodborne illness and provide a safer food supply by addressing and eliminating causes are primary programs in OSU Extension and OARDC. A safe food supply is central to all nations' security and is central to advancing world peace. Without a safe food supply, individual rights, sound governments, and economic stability and security, nationally and worldwide, will be threatened, as will be the natural environment that provides for sustainable food systems.

**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**

A client oriented research and development program in the food safety is critical to meeting society's needs. As we address problems and needs within our stakeholder communities, the organization (OARDC and OSU Extension) become better prepared to take advantage of emerging opportunities or to more rapidly address problems within these areas. Other key assumptions are: the issues within this program have been identified by our stakeholder communities, and/or via the scientific literature, reflect society's more important issues, and warrant allocation of resources. The understanding of this planned program and how society utilizes and depends on the associated research is key to present and future decision-making in provisioning of safe food domestically and worldwide; all citizens directly benefit from a safe, secure, and plentiful food supply supported by an advanced research and extension program; these lines of inquiry will provide necessary knowledge to inform human enterprises; food safety research and extension education are demands by society needed to meet current and future needs; and base federal funding will continue to be available and leverage for extramural grants to support this Planned Program

and the scientific staff who carry out the lines of inquiry. Likewise it is assumed that the federal base funding will be leverage for continuing to attract state funds.

**2. Ultimate goal(s) of this Program**

The ultimate goal of OARDC and OSU Extension is to reduce the incidence of foodborne illness and provide a safer food supply by addressing and eliminating causes.

**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
2012	15.0	0.0	1.5	0.0
2013	15.0	0.0	1.5	0.0
2014	15.0	0.0	1.5	0.0
2015	15.0	0.0	1.5	0.0
2016	0.0	0.0	1.5	0.0

**V(F). Planned Program (Activity)**

**1. Activity for the Program**

Food safety research to advance broad food safety goals include both basic and applied research. Research ranges from microbial studies to packaging. Laboratories, pilot plants, farms, and multiple business sites are available throughout state to permit data gathering and to continue long - term experiments. All functional laboratories and sites are improved over time as program need warrants. Parallel OSU Extension programs are developed based on client demand and food safety standards set by both the industry and regulators. Food safety programs to reduce the incidence of foodborne illness and provide a safer food supply by addressing and eliminating causes is a primary program goal of OSU Extension and OARDC. Specific activities for the food safety education for consumers include: 1) Conduct food safety education classes with participants in the FNP and EFNEP program; 2) Conduct ServSafe classes with food establishment managers and employees; 3)Conduct Safe Food Handling for Occasional Quantity Cooks classes with volunteer food preparers; and 4)Provide research-based information to consumers through various forms of media, phone calls, fact sheets, and web pages.

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

**Extension**

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> <li>● Education Class</li> <li>● Workshop</li> <li>● Demonstrations</li> </ul>	<ul style="list-style-type: none"> <li>● Public Service Announcement</li> <li>● Newsletters</li> </ul>

**3. Description of targeted audience**

Targeted audiences include, but are not limited to: specific individuals or groups who have expressed a need for food safety research and extension information that is to be derived through new research, extracted from on-going research, or is derived from scientific literature; fellow academic units that partner with food scientists to create systems and processes needed to support not only the research, but also the adoption of the research findings by stakeholders; fellow agencies or support organizations who will not only use the information but will also be brokers of that information, including embedding it into groups to encourage change; populations who have not requested the information but will likely benefit from that information, e.g. persons who engage in home canning of food; other scientists and scientific groups; political entities; students from pre-school to post doctorate studies; news organizations; business and industrial groups; food stamp or food stamp eligible families (FNP); Low income families with young children (EFNEP); food establishment managers (ServSafe manager training; food service employees (ServSafe employee training); volunteer food preparers (general population) (OQC); and general consumers (other formal or informal education).

### **V(G). Planned Program (Outputs)**

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
  - Direct Adult Contacts
  - Indirect Adult Contacts
  - Direct Youth Contacts
  - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

### **V(H). State Defined Outputs**

#### **1. Output Measure**

- Number of Graduate Students Completed
- Number of educational sessions held

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

**V(I). State Defined Outcome**

O. No	Outcome Name
1	Contribute to the advancement of knowledge about food packaging technologies, e.g. ultrasonic sealing, controlled environment packaging, to the extent that, annually, the risk of contamination due to packaging is reduced measurably.
2	Expand the knowledge base for contamination detection within packaged foods by developing or refining technologies such as magnetic resonance or infrared spectroscopy that will, within ten years, eliminate the problem.
3	Reduce food borne pathogens in the food supply chain.
4	Number of participants who learned new information from this program. (OSUE)
5	Number of participants who plan to adopt one or more recommended practices. (OSUE)

**Outcome # 1**

**1. Outcome Target**

Contribute to the advancement of knowledge about food packaging technologies, e.g. ultrasonic sealing, controlled environment packaging, to the extent that, annually, the risk of contamination due to packaging is reduced measurably.

**2. Outcome Type : Change in Knowledge Outcome Measure**

<b>2012:0</b>	<b>2013:1</b>	<b>2014:0</b>	<b>2015:1</b>	<b>2016:0</b>
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**3. Associated Knowledge Area(s)**

- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 2**

**1. Outcome Target**

Expand the knowledge base for contamination detection within packaged foods by developing or refining technologies such as magnetic resonance or infrared spectroscopy that will, within ten years, eliminate the problem.

**2. Outcome Type : Change in Knowledge Outcome Measure**

<b>2012:0</b>	<b>2013:1</b>	<b>2014:1</b>	<b>2015:1</b>	<b>2016:0</b>
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**3. Associated Knowledge Area(s)**

- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 3**

**1. Outcome Target**

Reduce food borne pathogens in the food supply chain.



**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:1                      2013:0                      2014:0                      2015:1                      2016:0**

**3. Associated Knowledge Area(s)**

- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 4**

**1. Outcome Target**

Number of participants who learned new information from this program. (OSUE)

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:4500                      2013:4500                      2014:4500                      2015:4500                      2016:10000**

**3. Associated Knowledge Area(s)**

- 703 - Nutrition Education and Behavior
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 5**

**1. Outcome Target**

Number of participants who plan to adopt one or more recommended practices. (OSUE)

**2. Outcome Type : Change in Action Outcome Measure**

**2012:3000                      2013:3000                      2014:3000                      2015:3000                      2016:8000**

**3. Associated Knowledge Area(s)**

- 703 - Nutrition Education and Behavior
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

#### **4. Associated Institute Type(s)**

- 1862 Extension

#### **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.)
- Other (National Security Threats )

##### **Description**

Climatic extremes impact food safety to the extent they impact supply or foster growth and dispersion of pest and pathogens. Climatic extremes impact the quantity and quality of food supplied as well as the timely distribution of food before contamination is an issue. Economic shifts such as to cost of processing equipment or production costs, public policy shifts, regulations, and shifts in demand will be impact outcomes. Food trends/fades, problem acceptance by individuals and groups, food advertising agendas, new biological and chemical threats, and public nutritional health - related issues are also external factors that effect outcomes. Formative evaluation though can lessen the burden by seeking feedback throughout the life of the program. Factors such as the availability of base funding to ensure a core faculty and staff, availability of extramural funds, and programmatic demands that often exceed resources, will affect outcomes.

#### **V(K). Planned Program - Planned Evaluation Studies**

##### **Description of Planned Evaluation Studies**

{NO DATA ENTERED}

## **V(A). Planned Program (Summary)**

### **Program # 5**

#### **1. Name of the Planned Program**

Global Food Security and Hunger

#### **2. Brief summary about Planned Program**

Global food security is a NIFA priority area, a signature area of OSU Extension and OARDC, a priority in the APLU/ESCOP Science Roadmap for Food and Agriculture, and a high priority item all across our nation and the world. To meet growing demand, food scientists and other agricultural and environmental scientists continue to make advances in techniques and processes that improve the quality of food, expand food preservation, protect against pathogens, advance detection systems for identifying threats to food security, increase functionality and increase both the quantity and quality of food stocks. Global Food Security and Hunger will be a priority program throughout this 2012 -2016 planning period. Due to the complexity of food systems, a robust research and extension program is required to meet societal needs for a secure food supply and reduce hunger worldwide. For example, OARDC is one of 11 institutions awarded a \$20 million grant from USDA-NIFA, that aims to keep Midwest corn-based cropping systems resilient in the face of future climate uncertainties. Given the importance of corn worldwide as a food stock such research is critical. Thus impacts in the majority of this Planned Programs contribute to a greater or less extent to feeding the world. To advance global food security requires inputs, outputs, and impacts in the total food supply/value chain ranging from soil conservation to effective food distribution systems worldwide. This Planned Program emphasis is reflected in and is central to the College of Food, Agricultural, and Environmental Sciences 2008 Strategic Plan that focuses on advancing education, scholarship, knowledge acquisition, and information diffusion in three signature areas : (1) food security, production, and human health; (2) environmental quality and sustainability; and (3) advanced bioenergy and biobased products. While signature area one (1) is primary to this Planned Program, signature areas two (2) and three (3) underpin the world's drive for food security. Without a sustainable environment and sustainable energy, other components of the food supply/value chain could not function. This program's impacts are far-reaching. For example, OARDC works with NASA on methods to heat food and sterilize waste in space. Using ohmic heating, packaging containing electrodes has been developed allowing astronauts to enjoy a hot meal. The techniques are needed on a possible mission to Mars. A parallel study has resulted in a new way to peel tomatoes using very little lye-an environmental waste problem-and preserve the nutrient-rich peel for use in sauces and purees. Currently, more than 12 million tons of tomatoes nationwide are processed into tomato sauce, puree, paste, and whole and diced products. Ohio produces over 177,000 tons of processing tomatoes, valued at nearly \$14 million annually. OARDC and OSU Extension recognize that global food security is also a local issue as reflected by specialist who study maximizing fruit and vegetable production in limited spaces comparing three ways of urban farming in empty, abandoned parking lots: in giant-sized pots, in raised beds on top of the blacktop, and in trenches cut right through the pavement. These findings will continue to serve as foundations as human nutrition and health continues to be a major focal area for OARDC and OSU Extension. As baby boomers enter their retirement years, cancer and heart concerns grow, and obesity is a national problem, each incremental improvement in we make in health care will have a major impact on society. In nutraceuticals research, for example, OARDC scientists are working with medical researchers in a 'crop to clinic'; program to examine how phytochemicals in foods fight certain human health problems. Research will continue to focus on nutrients found in berries to determine if they can stop or slow some types of cancer. OARDC research and OSU Extension programs will also continue to address how to make food safer, lengthening its shelf life, and provide expertise to medical researchers and food companies on how to protect food from pathogens. Salmonellosis, for example, is a food-borne disease with 1.4 million cases nationwide with a \$2.3 billion cost annually. Eggs are the primary source. OARDC scientists found that by treating whole shell eggs with a combination of ozone, mild heat, and slight pressure significantly reduced

contamination in eggs without damaging their quality. Ohio is the second-largest egg producer in the country with production valued at well over \$300 million annually. Salmonellosis can have tremendous negative economic impact in Ohio. OARDC and Extension members will continue to work diligently throughout this planning period to move this new knowledge into business, industry, and homes, in the US and abroad.

**3. Program existence :** Mature (More than 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
501	New and Improved Food Processing Technologies	25%		20%	
502	New and Improved Food Products	20%		15%	
503	Quality Maintenance in Storing and Marketing Food Products	5%		10%	
607	Consumer Economics	10%		0%	
701	Nutrient Composition of Food	0%		10%	
702	Requirements and Function of Nutrients and Other Food Components	0%		15%	
703	Nutrition Education and Behavior	10%		5%	
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources	10%		10%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	20%		15%	
	<b>Total</b>	100%		100%	

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

**1. Situation and priorities**

Advanced studies in systems related to food security are critical to providing for the sustained and secure flow of food in the producer - processor - distributor - consumer chain. Assuring that all their interests are informed by the best food science and extension programs available is an expectation of OARDC and OSU Extension. Requisite research by agricultural experiment stations and companion extension programs are mandatory to meet domestic demand and in provisioning food worldwide. This Planned Program directly supports OARDC and OSU Extension's broader goals of production efficiency, economic viability, environmental stewardship, and social acceptability of technologies and products introduced. OARDC and OSU Extension address direct needs of all their constituency groups by regularly

interacting with them and understanding their needs. OSU scientists interact with fellow other research and extension units, and with organized groups of producers, processors, distributors, and consumers. Demand for their expertise, processes, and products is high. Without a growing body of knowledge in this area to create plentiful, high quality, and secure global food system, opportunities will be missed and society will not be well served. With a sound body of literature, and a well-developed network of industrial partners, clientele, supporters, and companion agencies and organizations, OSU Extension and OARDC are well positioned to continue to affect positive change in the science behind food security. Effective research in this area requires modern laboratory facilities and access to industrial partners' facilities, as well as access to consumers who are the ultimate evaluators of the outcomes.. Faculty and staff in this program effectively provide the knowledge and technologies needed by stakeholders to inform production, processing, distribution, and consumer choices. OSU Extension has the capacity and expertise to advance programs to promote related knowledge acquisition, adoption of new techniques, and approaches to address global food security and hunger, and to help society grow the required expertise and human capital.

## **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**

A client oriented research, extension, and development program in the food security and hunger is critical to meeting society's overt and latent demands in this area. As we continue to address problems and needs within our stakeholder communities, the organization (OARDC and OSU Extension) become better prepared to take advantage of emerging opportunities or to more rapidly address problems within these areas. Other key assumptions are: the issues within this program have been identified by our stakeholder communities, and/or via the scientific literature, reflect the more important issues, and warrant allocation of resources; the understanding of this planned program and how society utilizes and depends on the associated research is key to present and future decision-making in provisioning of food domestically and worldwide; all citizens directly benefit from a safe, secure, and plentiful food supply supported by an advanced research and extension program; these lines of inquiry will provide necessary knowledge to inform human enterprises; food systems research and education are demands by society needed to meet current and future needs; and base federal funding will continue to be available and leverage for extramural grants to support this Planned Program and the scientific staff who carry out the lines of inquiry. Likewise it is assumed that the federal base funding will be leverage for continuing to attract state funds.

### **2. Ultimate goal(s) of this Program**

Food security research and extension programs will, in cooperation with other parallel areas: advance the study and improvement of the quality, functionality, and preparation/preservation of food, including relevant methodologies, techniques, and processes; provide the necessary research and extension programs necessary to improve and develop new foods, advance research frontiers in food quality, and

contribute to the understanding and development of functional foods, including nutraceuticals. Likewise research and extension will grow fundamental knowledge about human nutritional requirements to foster human health, fight hunger, and better understanding the relationship between foods consumed and physical and psychological impacts. Other related impacts are reported in their respective Planned Programs.

**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
2012	20.0	0.0	9.5	0.0
2013	20.0	0.0	9.5	0.0
2014	20.0	0.0	9.5	0.0
2015	20.0	0.0	9.5	0.0
2016	20.0	0.0	9.5	0.0

**V(F). Planned Program (Activity)**

**1. Activity for the Program**

This Planned Program advances broad global food security goals and includes both basic and applied research, and associated outreach and extension programs. Research ranges from microbial studies, to packaging, to food taste tests, to consumer preferences and behavior. Laboratories, pilot plants, farms, and multiple business sites are available throughout state to permit data gathering and to continue long - term experiments. All functional laboratories and sites are improved over time as program need warrants. Extension has the capacity to advance knowledge acquisition, promote adoption strategies, and help build human capital to promote global food security and reduce hunger worldwide. OARDC and OSU Extension faculty and staff engage in appropriate levels of outreach, engagement, and consultation, with both internal and external stakeholders.

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

Extension	
Direct Methods	Indirect Methods
<ul style="list-style-type: none"> <li>● Education Class</li> <li>● Workshop</li> <li>● Group Discussion</li> <li>● Demonstrations</li> <li>● Other 1 (One-on-one consultation)</li> </ul>	<ul style="list-style-type: none"> <li>● Public Service Announcement</li> <li>● Newsletters</li> <li>● Web sites other than eXtension</li> <li>● Other 1 (Factsheets)</li> </ul>

**3. Description of targeted audience**

Targeted audiences include, but are not limited to: specific individuals or groups who have expressed a need for food-related information that is to be derived through new research, extracted from on-going research, or is derived from scientific literature; fellow academic units that partner with food scientists to create systems and processes needed to support not only the research, but also the adoption of the research findings by stakeholders; fellow agencies or support organizations who will not only use the information but will also be brokers of that information, including embedding it into groups to encourage change; populations who have not requested the information but will likely benefit from that information, e.g. persons who engage in home canning of food; other scientists and scientific groups; political entities; other extension personnel; students from pre-school to post doctorate studies; news organizations; and business and industrial groups.

### **V(G). Planned Program (Outputs)**

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
    - Direct Adult Contacts
    - Indirect Adult Contacts
    - Direct Youth Contacts
    - Indirect Youth Contact
  - Number of patents submitted
  - Number of peer reviewed publications
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

### **V(H). State Defined Outputs**

#### **1. Output Measure**

- Number of graduate student completed
  - Number of participants attending educational programs of one teaching hour or more.
  - Total number of workshops offered to producers and agri-business leaders
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

**V(I). State Defined Outcome**

O. No	Outcome Name
1	Advance processing techniques, e.g. electrostatic coating, to achieve the desired traits requested by industrial partners, that are manifested in consumer demand studies, or that are novel technologies that may meet latent needs.
2	Participate in the creation of a standardized model and protocols for studying functional foods for the purpose of providing consumers with more informed functional choices that are currently available
3	Advance the study of stacking functional foods that have a lower than expected societal demand (e.g. soy) with more desirable foods such as tomato products as a means of providing consumers with more access than is currently present.
4	Expand utilization of products with known functionality or nutraceutical value and give consumers greater informed consumer choice, including the bioavailability of the desire substance in the food, than they presently have.
5	Reduce health risk by releasing at least one major study each five years demonstrating nutritional health benefits, e.g. carotenoids and cataracts, anthocyanins and colon cancer or as a substitute for artificial dyes.
6	Reduce health risk by releasing at least one major study each five years demonstrating negative nutritional side effects, fatty acids and obesity or obesity-related hepatic steatosis or prostate cancer.
7	Advance the understanding of the potential role of trace minerals such as the role of selenium in protection against breast cancer or copper's protecting against cardiovascular diseases to that extent society can make science-based choices.
8	Inform the process of collecting, storing, processing, and distributing waste products from plant and animal agriculture to the extent that there are demonstrated gains among multiple outcomes.
9	Processing technology research such as pulse electronic field, high pressure, ohmic heating, and microwave will provide processors with a set of alternatives leading to efficiency and quality gains within economic realities.
10	Processing technology research will improve and optimize equipment and processing of food in such manner as meet consumer demand as or before that demand emerges.
11	Reduce through research and development the negative processing impacts on physio-chemical or molecular properties of food within varying parameters to make foods more acceptable and higher quality commensurate with demand.
12	Advance and document improvements in quality and quantity of food stocks to meet global food security and hunger goals.
13	Ohio Market Maker results will indicate food preferences and number of farmers/retailers networks established (measured in number of networks established).
14	Establishment of a number of local/regional food systems.
15	The primary long term outcome measure for OSUE programming on this issue is the growth of direct farm sales in Ohio as reported through the Census of Agriculture and other Direct Marketing team activities that provide insight into improved economic and social conditions. (measured in dollars)



**Outcome # 1**

**1. Outcome Target**

Advance processing techniques, e.g. electrostatic coating, to achieve the desired traits requested by industrial partners, that are manifested in consumer demand studies, or that are novel technologies that may meet latent needs.

**2. Outcome Type : Change in Knowledge Outcome Measure**

<b>2012:0</b>	<b>2013:1</b>	<b>2014:0</b>	<b>2015:0</b>	<b>2016:0</b>
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**3. Associated Knowledge Area(s)**

- 501 - New and Improved Food Processing Technologies
- 502 - New and Improved Food Products
- 711 - Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 2**

**1. Outcome Target**

Participate in the creation of a standardized model and protocols for studying functional foods for the purpose of providing consumers with more informed functional choices that are currently available

**2. Outcome Type : Change in Knowledge Outcome Measure**

<b>2012:0</b>	<b>2013:1</b>	<b>2014:0</b>	<b>2015:0</b>	<b>2016:0</b>
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**3. Associated Knowledge Area(s)**

- 502 - New and Improved Food Products
- 701 - Nutrient Composition of Food
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 3**

**1. Outcome Target**

Advance the study of stacking functional foods that have a lower than expected societal demand (e.g. soy) with more desirable foods such as tomato products as a means of providing consumers with more access than is currently present.

**2. Outcome Type : Change in Knowledge Outcome Measure**

<b>2012:0</b>	<b>2013:0</b>	<b>2014:1</b>	<b>2015:0</b>	<b>2016:0</b>
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**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
- 701 - Nutrient Composition of Food
- 702 - Requirements and Function of Nutrients and Other Food Components
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 4**

**1. Outcome Target**

Expand utilization of products with known functionality or nutraceutical value and give consumers greater informed consumer choice, including the bioavailability of the desire substance in the food, than they presently have.

**2. Outcome Type : Change in Knowledge Outcome Measure**

<b>2012:0</b>	<b>2013:2</b>	<b>2014:0</b>	<b>2015:0</b>	<b>2016:0</b>
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**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
- 701 - Nutrient Composition of Food
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 711 - Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally

Occurring Toxins

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 5**

**1. Outcome Target**

Reduce health risk by releasing at least one major study each five years demonstrating nutritional health benefits, e.g. carotenoids and cataracts, anthocyanins and colon cancer or as a substitute for artificial dyes.

**2. Outcome Type : Change in Action Outcome Measure**

<b>2012:1</b>	<b>2013:0</b>	<b>2014:0</b>	<b>2015:0</b>	<b>2016:0</b>
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**3. Associated Knowledge Area(s)**

- 502 - New and Improved Food Products
- 701 - Nutrient Composition of Food
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 6**

**1. Outcome Target**

Reduce health risk by releasing at least one major study each five years demonstrating negative nutritional side effects, fatty acids and obesity or obesity-related hepatic steatosis or prostate cancer.

**2. Outcome Type : Change in Action Outcome Measure**

<b>2012:1</b>	<b>2013:0</b>	<b>2014:0</b>	<b>2015:0</b>	<b>2016:0</b>
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**3. Associated Knowledge Area(s)**

- 502 - New and Improved Food Products
- 701 - Nutrient Composition of Food
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 7**

**1. Outcome Target**

Advance the understanding of the potential role of trace minerals such as the role of selenium in protection against breast cancer or copper's protecting against cardiovascular diseases to that extent society can make science-based choices.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:1                      2013:0                      2014:0                      2015:0                      2016:0**

**3. Associated Knowledge Area(s)**

- 501 - New and Improved Food Processing Technologies
- 502 - New and Improved Food Products
- 701 - Nutrient Composition of Food
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 8**

**1. Outcome Target**

Inform the process of collecting, storing, processing, and distributing waste products from plant and animal agriculture to the extent that there are demonstrated gains among multiple outcomes.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:50                      2013:50                      2014:50                      2015:100                      2016:100**

**3. Associated Knowledge Area(s)**

- 501 - New and Improved Food Processing Technologies
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

**4. Associated Institute Type(s)**

- 1862 Extension
- 1862 Research

**Outcome # 9**

**1. Outcome Target**

Processing technology research such as pulse electronic field, high pressure, ohmic heating, and microwave will provide processors with a set of alternatives leading to efficiency and quality gains within economic realities.

**2. Outcome Type : Change in Knowledge Outcome Measure**

<b>2012:1</b>	<b>2013:0</b>	<b>2014:0</b>	<b>2015:1</b>	<b>2016:0</b>
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**3. Associated Knowledge Area(s)**

- 501 - New and Improved Food Processing Technologies
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 711 - Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 10**

**1. Outcome Target**

Processing technology research will improve and optimize equipment and processing of food in such manner as meet consumer demand as or before that demand emerges.

**2. Outcome Type : Change in Knowledge Outcome Measure**

<b>2012:1</b>	<b>2013:1</b>	<b>2014:0</b>	<b>2015:0</b>	<b>2016:0</b>
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**3. Associated Knowledge Area(s)**

- 501 - New and Improved Food Processing Technologies
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 711 - Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 11**

**1. Outcome Target**

Reduce through research and development the negative processing impacts on physio-chemical or molecular properties of food within varying parameters to make foods more acceptable and higher quality commensurate with demand.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:1                      2013:0                      2014:0                      2015:0                      2016:0**

**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
- 701 - Nutrient Composition of Food
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 711 - Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 12**

**1. Outcome Target**

Advance and document improvements in quality and quantity of food stocks to meet global food security and hunger goals.

**2. Outcome Type : Change in Action Outcome Measure**

**2012:0                      2013:1                      2014:1                      2015:0                      2016:0**

**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
- 701 - Nutrient Composition of Food
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior

**4. Associated Institute Type(s)**

- 1862 Extension
- 1862 Research

**Outcome # 13**

**1. Outcome Target**

Ohio Market Maker results will indicate food preferences and number of farmers/retailers networks established (measured in number of networks established).

**2. Outcome Type : Change in Action Outcome Measure**

**2012:100                      2013:100                      2014:100                      2015:100                      2016:100**

**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
- 607 - Consumer Economics
- 701 - Nutrient Composition of Food
- 703 - Nutrition Education and Behavior
- 711 - Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 14**

**1. Outcome Target**

Establishment of a number of local/regional food systems.

**2. Outcome Type : Change in Action Outcome Measure**

**2012:7                      2013:7                      2014:7                      2015:7                      2016:8**

**3. Associated Knowledge Area(s)**

- 501 - New and Improved Food Processing Technologies
- 502 - New and Improved Food Products
- 607 - Consumer Economics
- 703 - Nutrition Education and Behavior
- 711 - Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 15**

**1. Outcome Target**

The primary long term outcome measure for OSUE programming on this issue is the growth of direct farm sales in Ohio as reported through the Census of Agriculture and other Direct Marketing team activities that provide insight into improved economic and social conditions. (measured in dollars)

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:10000                      2013:10000                      2014:10000                      2015:10000                      2016:10000**

**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
- 607 - Consumer Economics
- 711 - Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

**4. Associated Institute Type(s)**

- 1862 Extension



## **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.)
- Other (World conflict and terrorism)

#### **Description**

World conflict, cost of supply and distribution of foodstuff, and storage of foodstuffs, both raw and processed, are major limitations that affect outcome. Climatic extremes to the extent they impact growth and supply, economic shifts such as to cost of processing equipment or production costs, public policy shifts, regulations, and shifts in demand will impact outcomes. Food trends/fades, food advertising agendas, new biological and chemical threats, and public nutritional health related issues are also external factors that effect outcomes. In developing countries, technologies, availability of basics such as seeds or livestock, soil, and water for farming, labor, and a secure farming environment are limiting factors. Formative evaluation though can lessen the burden by seeking feedback throughout the life of the program. Factors such as the availability of base funding to ensure a core faculty and staff, availability of extramural funds, and programmatic demands that often exceed resources, will affect outcomes.

## **V(K). Planned Program - Planned Evaluation Studies**

### **Description of Planned Evaluation Studies**

## **V(A). Planned Program (Summary)**

### **Program # 6**

#### **1. Name of the Planned Program**

Soil, Air and Water (OARDC Led)

#### **2. Brief summary about Planned Program**

Soil, air, and water resources underpin sustainable ecosystems. Sustainability is central to the College of Food, Agricultural, and Environmental Sciences 2008 Strategic Plan that focuses on advancing education, scholarship, knowledge acquisition, and information diffusion in three signature areas : (1) food security, production, and human health; (2) environmental quality and sustainability; and (3) advanced bioenergy and biobased products. Soil, air and water resources are linked to each of these areas and to all of the Planned Programs reported herein. Likewise 'demands on the environment and natural resource base' is a priority in the APLU/ESCOP Science Roadmap for Food and Agriculture. OSU has provided national and international leadership in this area for well over a half a century and will continue to do so throughout this 2012 -2016 planning period. Achievements within all OARDC Planned Programs are dependent upon stable functioning ecosystems; soil, water, and air are the primary physical underpinnings of those systems. The understanding of interactions among soil, water, and air resources provide a basis for delivering to society a secure supply of food, fiber, other associated products, and related services. The appraisal of soil systems, including the physical, chemical, and biological components, their management for targeted outcomes, and the monitoring and mapping thereof, are critical research components in this planning period. Likewise these activities provide a basis for extending such knowledge to stakeholders who have participated in defining the need. Soil, water, and air interactions are explored in relationship to plant growth and development with particular focus on plant nutrition. Included in this line of inquiry, but not limited to, are soil microbes, management practices for surface and subsurface components, and amendments to soil and water and the effects thereof, both positive and negative. While analysis and individual practices are at the field and farm level, the total systems approach typically will be carried out at the watershed level, or sub region of the watershed. To that end, the supplying of water for plant, animal, human, and business use will be studied, as will methods to conserve and protect water resources and watersheds. Soil protection and management of effects of wind and water, and other natural forces, are included. Both components of the natural watersheds and built structures, e.g. wetlands, will continue as research and extension foci. Scarcity of land and water resources demands the investigation of alternative uses and efficiency studies. Understanding of weather and climate as well as air resources including, for example, odors from animals or how atmospheric carbon that can be attracted and stored in soil, wetlands, and living plants are a growing areas of importance to a fuller comprehension of soil, water and air systems. Pollution prevention and mitigation of negative effects of odors, carbon loading, other related air quality issues are critical lines of inquiry that are being pursued. Each line of inquiry informs questions surrounding climate change and how to maintain sustainable in systems in the face of change. Knowledge from these inquiries provides a basis for extending knowledge that, for example, has been requested to help address rural urban interface conflicts, e.g. odors from animal operations. Those odors, while a social problem, also contribute to atmospheric loading of pollutants. Soil, air, and water related research and extension programs will continue to be foundational for all 2012 -2016 Planned Programs.

**3. Program existence :** Mature (More than 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	5%		10%	
102	Soil, Plant, Water, Nutrient Relationships	35%		25%	
103	Management of Saline and Sodic Soils and Salinity	0%		5%	
111	Conservation and Efficient Use of Water	20%		15%	
112	Watershed Protection and Management	20%		10%	
131	Alternative Uses of Land	0%		10%	
132	Weather and Climate	0%		5%	
133	Pollution Prevention and Mitigation	0%		10%	
141	Air Resource Protection and Management	20%		10%	
	<b>Total</b>	100%		100%	

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

**1. Situation and priorities**

As societal demands increase for natural resources and associated commodities such as biomass for advanced energy and biobased materials, and for ever-increasing environmental services, greater understanding of conservation and wise use of soil, water, and air resources is paramount. Environmental shifts, such as climate change, can have dramatic effects on soil, air, and water resources.....the elements that underpin all life. These shifts can lead to unmet needs and unresolved conflicts, all having social, economic, and environmental consequences. Agriculture experiment stations and extension programs, especially in a highly urbanized state such as Ohio, have a unique opportunity to aid in meeting both latent and overtly stated needs of society in this Planned Program area. Individuals and families associated with food and fiber production need the research information that is generated through this program for their business, as do processors. Communities, both rural and urban, need both the biological and management knowledge to protect their natural resource base and to address rural - urban interface needs and conflicts. Commodity, environmental, community groups such as watershed-based community groups, regulators, and political leaders are demanding the best science and extension education programs to insure that resource conflicts are avoided or managed, and that growth and development can occur within reasonable social and environmental bounds. Such work is well-grounded theoretically and extensive applied peer reviewed literature exists. The challenges lie in applying what is known to new and emerging issues such as energy independence and generating basic research as needed. While a number

of areas, such as microbial ecology and plant nutrition still require extensive laboratory experiments, it is the on-farm and in-watershed fieldwork, where stakeholders live and work, that provide some of the richest opportunities for research and extension to engage in situational analyses and priority setting.

## **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**

This Planned Program will continue to be a primary focus of this reporting unit through this 2012 - 2016 planning period. The program assumes that by understanding the scientific underpinnings (both basic and applied) of soil, water, and air sciences, independently and collectively, we can address problems and needs within our stakeholder communities. Key assumptions are: 1) The issues within this program that have been identified within our stakeholder communities and/or within the scientific literature reflect the more important issues and warrant allocation of resources. 2) The understanding of soils, soils systems, and how society utilizes and depends on soil is key to present and future decision-making in provisioning and managing food and fiber systems, sustaining environmental services, and mitigating impacts of global climate change. 3) Commodity groups, processors, and consumers depend on a relatively stable climate, and on soil, water, air and associated nutrient research for plant and animal production. 4) Research related to water and accessibility of water for plant and animal nutrition, human enterprises, and environmental services is important to society and will be utilized for enhanced decision-making by stakeholders and all citizens.

5) Research and education related to conservation of water, and landscape-scale best management practices in water projects, is demanded by society to meet current and future needs. 6) Air-related research, as well as air resources (including sequestration of air borne carbon) for plant and animal production, for human health, and for mitigation on climate change, are high priorities among all sectors within our industry and support publics. These issues are manifested at some community level and those stakeholders who are most vested will become involved; others' involvement will be limited, yet they will reap the benefits of a sound basic and applied understanding of related research and extension programming. It is further assumed that base federal funding will continue to be available and leveraged to support this planned program and the scientific staff who carry out the lines of inquiry noted within the knowledge areas for this program. Likewise it is assumed that the federal base funding will be leverage to attract state and extramural funds.

### **2. Ultimate goal(s) of this Program**

Goals are: 1) Soils research to: a) support USDA, NRCS, ODNR and local government/stakeholder initiatives to understand, map, and to determine and implement best management/allocation practices for soils of Ohio and the region; b) support multiple approaches to carbon management and climate change mitigation through carbon sequestration; c) enhance soil management for greater economic and environmental gains. 2) Water research to: a) support USDA, NRCS, ODNR and local government/stakeholder initiatives to understand, map, and determine and implement best

practices/allocation for water resources and watersheds of Ohio and the region; b) enhance water management for greater economic and environmental gains. 3) Air research to: a) support federal, state, and local agendas, including stakeholders and beneficiaries thereof, seeking to mitigate program-related air quality problems or to enhance air quality for plant, animal, and human health, including the reduction of atmospheric pollution; b) Support unique, both new and yet to emerge, air related programs such as carbon sequestration for agronomic, economic (e.g. carbon trading), and environmental gains for society as a whole and for specific stakeholder groups. 4) Integrated soil, water and air research to - understand the system in such manner as to inform both on-site (e.g. on-farm) and landscape scale decisions necessary to meet individual stakeholder groups' and societal needs, - Support international, national, state, and local agendas for advancing environmental quality to insure a sustained flow of goods and services that will meet intergenerational demands. 5) To contribute to the theoretical knowledge base within this Planned Program to ensure that, where feasible, all applied research can be grounded in the best science available.

**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
2012	0.0	0.0	6.5	0.0
2013	0.0	0.0	6.5	0.0
2014	0.0	0.0	6.5	0.0
2015	0.0	0.0	6.5	0.0
2016	0.0	0.0	6.5	0.0

**V(F). Planned Program (Activity)**

**1. Activity for the Program**

On -going research activities include both basic and applied research. Both laboratory and multiple field sites/research stations are available throughout state to permit data gathering and to continue long - term experiments, such as no-till plots. On-farm research takes place, as do national and international studies, as is evidenced by programs such as OARDC's carbon sequestration program. All functional laboratories and sites will continue to be improved over time as program need and resources available warrants. OARDC faculty and staff engage in appropriate levels of outreach, engagement, and consultation, with both internal stakeholders such as fellow extension personnel and with external stakeholders.

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

Extension	
Direct Methods	Indirect Methods

- Education Class
- Workshop
- Demonstrations

- Public Service Announcement
- Newsletters

### 3. Description of targeted audience

Targeted audiences include, but not limited to: 1) Specific individuals or groups who have expressed a need for certain information that is to be derived through new research, extracted from on-going research, or is derived from scientific literature. Often those requests are communicated to OARDC by an intermediary such as a staffer at Ohio Dept. of Natural Resources or a county extension agent; 2) Fellow agencies or support organizations that will not only use the information but will also be brokers of that information, including embedding it into groups to encourage change; 3) Populations who have not requested the information but will likely benefit from that information, e.g. immigrant populations; 4) Other scientists and scientific groups; 5) Political entities; 6) Extension personnel; 7) Students from pre-school to post doctorate studies; 8) News organizations; and 9) Business groups such as chambers of commerce and community coalitions.

### V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
  - Direct Adult Contacts
  - Indirect Adult Contacts
  - Direct Youth Contacts
  - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

### V(H). State Defined Outputs

#### 1. Output Measure

- Number of graduate students completed

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

**V(I). State Defined Outcome**

O. No	Outcome Name
1	Continue to advance soil, water, nutrient, and plant research to, among other outcomes, ensure Ohio continues to be one of the top five states in corn and soybean production and has knowledge to support growing niche market agriculture, organic farming, and biobased products.
2	Provide the necessary research finding (scientific knowledge and techniques) to support stakeholder compliance with Ohio and federal EPA regulations, and future regulations, regarding odors and other air quality issues in ag production and processing.
3	Expand watershed and ecosystem level modeling to the extent that scientific data and watershed management protocols can bring all streams effected by agriculture and natural resource runoff into compliance with Ohio EPA standards.
4	Through the provisioning of watershed specific data, support the creation of and conservation action of community-based watershed networks in each major watershed in Ohio.
5	Advance the basic knowledge contribution so that Ohio continues to be viewed as a center of excellence in terms of soils and water sciences, and associated extension programming.
6	Provide the necessary soil, air, weather/climate, and water research, in conjunction with actions in other planned programs KA (e.g. IPM), to permit continued adoption of conservation tillage practices in the face of problems such as climatic changes, pest, etc.

**Outcome # 1**

**1. Outcome Target**

Continue to advance soil, water, nutrient, and plant research to, among other outcomes, ensure Ohio continues to be one of the top five states in corn and soybean production and has knowledge to support growing niche market agriculture, organic farming, and biobased products.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:0                      2013:1                      2014:0                      2015:0                      2016:0**

**3. Associated Knowledge Area(s)**

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 132 - Weather and Climate

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 2**

**1. Outcome Target**

Provide the necessary research finding (scientific knowledge and techniques) to support stakeholder compliance with Ohio and federal EPA regulations, and future regulations, regarding odors and other air quality issues in ag production and processing.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:0                      2013:1                      2014:0                      2015:1                      2016:0**

**3. Associated Knowledge Area(s)**

- 133 - Pollution Prevention and Mitigation
- 141 - Air Resource Protection and Management

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 3**

**1. Outcome Target**

Expand watershed and ecosystem level modeling to the extent that scientific data and watershed management protocols can bring all streams effected by agriculture and natural resource runoff into



compliance with Ohio EPA standards.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:1                      2013:1                      2014:0                      2015:0                      2016:0**

**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
- 131 - Alternative Uses of Land
- 133 - Pollution Prevention and Mitigation

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 4**

**1. Outcome Target**

Through the provisioning of watershed specific data, support the creation of and conservation action of community-based watershed networks in each major watershed in Ohio.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:0                      2013:1                      2014:0                      2015:0                      2016:0**

**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 # 5**

**1. Outcome Target**

Advance the basic knowledge contribution so that Ohio continues to be viewed as a center of

excellence in terms of soils and water sciences, and associated extension programming.

**2. Outcome Type** : Change in Knowledge Outcome Measure

**2012:0**                      **2013:0**                      **2014:0**                      **2015:1**                      **2016:0**

**3. Associated Knowledge Area(s)**

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 103 - Management of Saline and Sodic Soils and Salinity
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 131 - Alternative Uses of Land
- 132 - Weather and Climate
- 133 - Pollution Prevention and Mitigation
- 141 - Air Resource Protection and Management

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 6**

**1. Outcome Target**

Provide the necessary soil, air, weather/climate, and water research, in conjunction with actions in other planned programs KA (e.g. IPM), to permit continued adoption of conservation tillage practices in the face of problems such as climatic changes, pest, etc.

**2. Outcome Type** : Change in Knowledge Outcome Measure

**2012:0**                      **2013:1**                      **2014:0**                      **2015:1**                      **2016:0**

**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
- 131 - Alternative Uses of Land
- 132 - Weather and Climate
- 141 - Air Resource Protection and Management

#### **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.)
- Other (extramural funding)

#### **Description**

Climatic extremes, coupled with pest and diseases that are often climate related, can impact outcomes. As the food, fiber, and environmental economy adjust to the global marketplace, in conjunction with public policy shifts, regulations, and shifts in demand, outcomes will be impacted. Formative evaluation though can lessen the burden by seeking feedback throughout the life of the program. Factors such as the availability of base funding to ensure a core faculty and staff, availability of extramural funds, availability of competitive funds, and programmatic demands that often exceed resources, will affect outcomes.

### **V(K). Planned Program - Planned Evaluation Studies**

#### **Description of Planned Evaluation Studies**

{NO DATA ENTERED}

## **V(A). Planned Program (Summary)**

### **Program # 7**

#### **1. Name of the Planned Program**

Natural Resources and Environmental Systems (OARDC Led)

#### **2. Brief summary about Planned Program**

Natural resources and environmental systems are central within the College of Food, Agricultural, and Environmental Sciences 2008 Strategic Plan that focuses on advancing education, scholarship, knowledge acquisition, and information diffusion in three signature areas: (1) food security, production, and human health; (2) environmental quality and sustainability; and (3) advanced bioenergy and biobased products. Natural resources and environment will continue to be central to OARDC research mission, with support from OSU Extension, throughout this 2012 -2016 planing period. Likewise the APLU/ESCOP Science Roadmap for Food and Agriculture has listed demands on the environment and natural resource base as a priority area. In 2008 faculty working in this planned program defined their mission: to develop an academic program focused on better understanding human interactions with the natural environment where social factors, science, and political practices serve as co-determinants of change. Natural resources and environmental systems research focuses on managing and sustaining natural resources and ecosystems for the citizens of Ohio, the nation, and the world. The concept of and faculty attracted to this program area are dramatically changing as indicated by the Dr. Steven Lower, a faculty member in the School of Environment and Natural Resources specializing in surface chemistry, receiving a the Presidential Early Career Awards for Scientists and Engineers. Such new faculty members will certainly lead in growing new impact areas. All renewable natural resources and related environmental systems are closely tied to climate change and other environmental shifts, both natural and human induced shifts. Ohio is one-third forested. Private landowners hold most of the forest thus a significant portion of our research and outreach is and will continue to be private-owner centered. Emphasis on grasslands/grazing lands, urban forest, agroforestry, and outdoor recreation are also found within this program. Key to managing the forest and other natural systems for a sustained flow of environmental goods and services requires an understanding of how to conserve the diversity with particular emphasis on, and strengths in, aquatic and terrestrial wildlife ecology. Research programs in this Planned Program focus both on the individual components as defined in the selected knowledge areas and the collective community and landscape scale functions. Ohio's landscapes are managed primarily in small tracks under fairly intense population or production pressures. Thus, a continued understanding of the science of managing in such complex landscapes is critical to providing a sound resource base to meet human and wildlife needs, while seeking to protect Ohio's biological diversity, some of which has regional and national importance, e.g. migratory route for song birds, hawks, ducks, and geese. The latter two are important to the hunting industry, while the songbirds and hawks are important non-game species and contribute to Ohio's tourism industry. Forest sustainability requires an understanding of biology, silviculture, management and modeling, and forest products, both from forest science and horticultural science perspectives. These activities include the conservation of biological diversity through on-site efforts to protect resources, as well as seed bank and germ plasm programs. In partnership with Ohio Department of Natural Resources and USDA, and other partners at the federal, state and local levels, OARDC will continue to advance studies in traditional fisheries and wildlife programs for game and non-game programs, as well as conservation biology program for protection and restoration of natural systems. Human- wildlife interactions are studied. An ever-growing area, and a second signature area within the College's 2008 Strategic Plan- advanced/sustainable energy and biobased products - will continue to be highly dependent on the success of this program, especially as a producer of biomass. All biomass production will be impacted in some fashion as climates continue to change. A companion OSU Extension program communicates natural resource research and management findings and provide educational programs related to environmental stewardship. The long term goal is to achieve sustainability.

**3. Program existence :** Mature (More than 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
121	Management of Range Resources	0%		5%	
122	Management and Control of Forest and Range Fires	0%		5%	
123	Management and Sustainability of Forest Resources	25%		15%	
124	Urban Forestry	0%		10%	
125	Agroforestry	0%		10%	
134	Outdoor Recreation	0%		10%	
135	Aquatic and Terrestrial Wildlife	60%		35%	
136	Conservation of Biological Diversity	15%		10%	
	<b>Total</b>	100%		100%	

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

**1. Situation and priorities**

Society demands sustainable natural resources based commodities and environmental services, particularly in terms of forest-related goods and services, and especially in the area of fish and wildlife resources. With 11 million people in a relative small state, the demand for consumptive and non-consumptive uses of Ohio resources continues to grow. As travel costs continue to remain high, the demand for local resource utilization is expected to increase demand for agriculture experiment station research in this area and companion extension programming. In a highly urbanized state such as Ohio, the organization has a heightened obligation to meet this demand and to aid in conserving resources, as well as generating economic return and creating jobs that are directly or indirectly dependent on sustainable resource management practices. Individuals and families, as well as companion agencies involved in the food and fiber production, need the research information that is generated through this program, as do various sectors of the public including environmental organizations, hunters, fishers, birdwatchers, hikers, etc. Communities, both rural and urban, need both the conservation biology and management knowledge to protect and wisely use their natural resource base. All environmental resources are issues of concern from both a regulatory and from an aesthetic point of view. Conflicts do occur over differing human values, e.g. dove hunting. Work in these knowledge areas is well-grounded theoretically and extensive applied peer-reviewed literature exists. OARDC has sponsored efforts in this program since the late 1800s. The challenges lie in applying what is known to new and emerging issues and generating lines of research as needed to ensure that the citizens' needs are met and that related issues do not become an impediment to

food, fiber, advanced energy, and advanced biobased materials production.

## **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**

Within this Planned Program, OARDC lines of inquiry will provide necessary information to inform human enterprises while protecting environmental services. This is an important area of study for society and will be utilized for enhanced decision-making by stakeholders and all citizens. Research and education related to conservation of natural resources, and landscape-scale best management practices that are being adopted, is a demand by society to meet current and future needs. These issues are manifested at some community level and those stakeholders who are most vested will become involved; others' involvement will be limited yet they will reap the benefits of a sound basic and applied resource understanding of these research and extension programs. It is assumed that base federal funding will continue to be available and leveraged to support this Planned Program and the scientific staff who carry out the lines of inquiry noted within the knowledge areas for this program. Likewise it is assumed that the federal base funding will be leverage for continuing to attract state and extramural funds.

### **2. Ultimate goal(s) of this Program**

Goals are: Forest resource related research - advance the understanding of forest biology and ecology commensurate with the demands in Ohio and the region, as well as silvicultural techniques, horticultural techniques, forest systems modeling, outdoor recreation, and wood manufacturing; expand knowledge of how to use this resource base while conserving diversity and expanding environmental services such as clean air and water from forests; enhance overall management for greater economic, social (including recreational) and environmental gains. Conservation biology research - support USDA, USDI, ODNR, and local government/stakeholder initiatives to more fully understand the biology of Ohio landscapes and determine and implement best practices/allocation strategies for resource protection and utilization. Aquatic and terrestrial wildlife research - supports federal, state, and local agendas, including all those who are stakeholders and beneficiaries thereof, in seeking to conserve and utilize these aquatic and terrestrial wildlife resources in a sustainable manner while managing associated conflicts; engage in scientific inquiries at the genetic, species, community, and landscape scale levels to investigate biological and physical components, including influences of human enterprises, for the purpose of meeting wildlife needs in Ohio and the region; study conflicts leading to negative human - wildlife interface for the purpose of mitigating negative effects on wildlife population and on human enterprises, e.g. wildlife depredation. Integrated natural resources and environmental systems research - understand the system in such manner as to inform both on-site (e.g. community, watershed) and landscape scale decisions necessary to meet individual stakeholder groups' and societal needs; support international, national, state and local agendas for advancing natural resources and environmental systems research to insure a sustained flow of goods and services that will meet intergenerational demands; to contribute to the theoretical knowledge

base within this planned program to ensure that where possible all applied research can be grounded in the best science and evaluation available.

**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
2012	0.0	0.0	3.0	0.0
2013	0.0	0.0	3.0	0.0
2014	0.0	0.0	3.0	0.0
2015	0.0	0.0	3.0	0.0
2016	0.0	0.0	3.0	0.0

**V(F). Planned Program (Activity)**

**1. Activity for the Program**

Natural resource and environmental systems program includes both basic and applied research. Both laboratories and multiple field sites are available throughout state to permit data gathering and to continue long - term experiments, such as human -wildlife interaction studies. Extensive in-state research takes place as do national and international studies, as is evidenced by programs such as OARDC's avian ecology studies. Close working relationships with the organizations such as the Ohio Department of Natural Resources will continue to greatly enhance program capacity and outputs/impacts. All functional laboratories and sites are improved over time as program need and resources available warrant. OARDC faculty and staff engage in appropriate levels of outreach, engagement, and consultation with both internal stakeholders, such as fellow extension personnel, and with external stakeholders.

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

Extension	
Direct Methods	Indirect Methods
<ul style="list-style-type: none"> <li>● Education Class</li> <li>● Workshop</li> <li>● Demonstrations</li> </ul>	<ul style="list-style-type: none"> <li>● Public Service Announcement</li> <li>● Newsletters</li> </ul>

**3. Description of targeted audience**

Targeted audiences include, but are not limited to: specific individuals or groups who have expressed a need for natural resources and environmental research knowledge that is to be derived through new research, extracted from on-going research, or is derived from scientific literature. Often those requests are communicated to OARDC by an intermediary such as a staffer at USDA, ODNR, or a county extension agent; related agencies or support organizations who will not only use the information but will also be brokers of that information, including embedding it into groups to encourage change, e.g. fish and wildlife clubs; - populations who have not requested the information but will likely benefit from that information, e.

g. people who fish for recreation; other scientists and scientific groups; political entities; extension personnel; students from pre-school to post doctorate studies; news organizations; business groups such as Ohio Farm Bureau; and community collations such as watershed collations.

### **V(G). Planned Program (Outputs)**

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
  - Direct Adult Contacts
  - Indirect Adult Contacts
  - Direct Youth Contacts
  - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

### **V(H). State Defined Outputs**

#### **1. Output Measure**

- Number of graduate students completed

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.



**V(I). State Defined Outcome**

O. No	Outcome Name
1	In conjunction with companion agencies and organizations, advance research in forest biology and ecology to promote advances in best management practices on private forest land in Ohio.
2	Improve the flow of forest raw materials to the extent it meets the needs of Ohio industries within ten years.
3	Increase the production of oak and reduce maple to eventually achieve a balance equivalent to forest with natural fire regimes.
4	Meet federal and state needs for research data related to Ohio ecosystems as the demand arises
5	Increase the scientific understanding necessary to maintain flow of environmental goods and services through conservation actions commensurate with regional demand, i.e. Buffer zones in forest riparian zones, reforestation, CREP, carbon sequestration in forests and grassland biomass, outdoor recreation opportunities, urban forest zones.
6	Advance research knowledge, both basic and applied, in the areas of silviculture and horticulture to existing and emerging industry and consumer demand regarding forest genetics, forest biology, seed production, nutrition, and related topics.
7	Meet ODNR, USDA, USDI, local, commodity groups, community, and other stakeholder demands for scientific knowledge to inform existing and emerging issues/practices in aquatic and terrestrial wildlife including human wildlife use/conflicts, and human to human conflicts related to wildlife and use.
8	To contribute to the theoretical knowledge base within this planned program to ensure that where possible all applied research can be grounded in the best science and evaluation available in all knowledge areas selected.

**Outcome # 1**

**1. Outcome Target**

In conjunction with companion agencies and organizations, advance research in forest biology and ecology to promote advances in best management practices on private forest land in Ohio.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:0                      2013:1                      2014:0                      2015:0                      2016:0**

**3. Associated Knowledge Area(s)**

- 121 - Management of Range Resources
- 122 - Management and Control of Forest and Range Fires
- 123 - Management and Sustainability of Forest Resources
- 124 - Urban Forestry
- 125 - Agroforestry
- 134 - Outdoor Recreation
- 135 - Aquatic and Terrestrial Wildlife
- 136 - Conservation of Biological Diversity

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 2**

**1. Outcome Target**

Improve the flow of forest raw materials to the extent it meets the needs of Ohio industries within ten years.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:0                      2013:0                      2014:0                      2015:1                      2016:0**

**3. Associated Knowledge Area(s)**

- 121 - Management of Range Resources
- 122 - Management and Control of Forest and Range Fires
- 123 - Management and Sustainability of Forest Resources
- 125 - Agroforestry
- 135 - Aquatic and Terrestrial Wildlife
- 136 - Conservation of Biological Diversity

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 3**

**1. Outcome Target**

Increase the production of oak and reduce maple to eventually achieve a balance equivalent to forest with natural fire regimes.

**2. Outcome Type : Change in Action Outcome Measure**

<b>2012:0</b>	<b>2013:1</b>	<b>2014:0</b>	<b>2015:0</b>	<b>2016:0</b>
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**3. Associated Knowledge Area(s)**

- 121 - Management of Range Resources
- 122 - Management and Control of Forest and Range Fires
- 123 - Management and Sustainability of Forest Resources
- 135 - Aquatic and Terrestrial Wildlife
- 136 - Conservation of Biological Diversity

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 4**

**1. Outcome Target**

Meet federal and state needs for research data related to Ohio ecosystems as the demand arises

**2. Outcome Type : Change in Knowledge Outcome Measure**

<b>2012:1</b>	<b>2013:0</b>	<b>2014:0</b>	<b>2015:2</b>	<b>2016:0</b>
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**3. Associated Knowledge Area(s)**

- 121 - Management of Range Resources
- 122 - Management and Control of Forest and Range Fires
- 123 - Management and Sustainability of Forest Resources
- 124 - Urban Forestry
- 125 - Agroforestry
- 134 - Outdoor Recreation
- 135 - Aquatic and Terrestrial Wildlife

- 136 - Conservation of Biological Diversity

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 5**

**1. Outcome Target**

Increase the scientific understanding necessary to maintain flow of environmental goods and services through conservation actions commensurate with regional demand, i.e. Buffer zones in forest riparian zones, reforestation, CREP, carbon sequestration in forests and grassland biomass, outdoor recreation opportunities, urban forest zones.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:0                      2013:1                      2014:0                      2015:0                      2016:0**

**3. Associated Knowledge Area(s)**

- 121 - Management of Range Resources
- 122 - Management and Control of Forest and Range Fires
- 123 - Management and Sustainability of Forest Resources
- 124 - Urban Forestry
- 125 - Agroforestry
- 134 - Outdoor Recreation
- 135 - Aquatic and Terrestrial Wildlife
- 136 - Conservation of Biological Diversity

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 6**

**1. Outcome Target**

Advance research knowledge, both basic and applied, in the areas of silviculture and horticulture to existing and emerging industry and consumer demand regarding forest genetics, forest biology, seed production, nutrition, and related topics.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:0                      2013:1                      2014:0                      2015:0                      2016:0**

**3. Associated Knowledge Area(s)**

- 121 - Management of Range Resources
- 122 - Management and Control of Forest and Range Fires
- 123 - Management and Sustainability of Forest Resources
- 124 - Urban Forestry
- 125 - Agroforestry
- 134 - Outdoor Recreation
- 135 - Aquatic and Terrestrial Wildlife
- 136 - Conservation of Biological Diversity

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 7**

**1. Outcome Target**

Meet ODNR, USDA, USDI, local, commodity groups, community, and other stakeholder demands for scientific knowledge to inform existing and emerging issues/practices in aquatic and terrestrial wildlife including human wildlife use/conflicts, and human to human conflicts related to wildlife and use.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:1                      2013:0                      2014:1                      2015:1                      2016:0**

**3. Associated Knowledge Area(s)**

- 121 - Management of Range Resources
- 123 - Management and Sustainability of Forest Resources
- 134 - Outdoor Recreation
- 135 - Aquatic and Terrestrial Wildlife
- 136 - Conservation of Biological Diversity

**4. Associated Institute Type(s)**

- 1862 Research

## **Outcome # 8**

### **1. Outcome Target**

To contribute to the theoretical knowledge base within this planned program to ensure that where possible all applied research can be grounded in the best science and evaluation available in all knowledge areas selected.

### **2. Outcome Type : Change in Knowledge Outcome Measure**

<b>2012:1</b>	<b>2013:1</b>	<b>2014:0</b>	<b>2015:0</b>	<b>2016:0</b>
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### **3. Associated Knowledge Area(s)**

- 121 - Management of Range Resources
- 122 - Management and Control of Forest and Range Fires
- 123 - Management and Sustainability of Forest Resources
- 124 - Urban Forestry
- 125 - Agroforestry
- 134 - Outdoor Recreation
- 135 - Aquatic and Terrestrial Wildlife
- 136 - Conservation of Biological Diversity

### **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**

Climatic extremes, coupled with pest and diseases that are often climate related, can impact outcomes. Public policy shifts, regulations, laws, and shifts in demand will be impact outcomes. Formative evaluation though can lessen the burden by seeking feedback throughout the life of the program. Factors such as the availability of base funding to ensure a core faculty and staff, availability of extramural funds, and programmatic demands that often exceed resources, will affect outcomes.

**V(K). Planned Program - Planned Evaluation Studies**

**Description of Planned Evaluation Studies**

{NO DATA ENTERED}

## **V(A). Planned Program (Summary)**

### **Program # 8**

#### **1. Name of the Planned Program**

Plants Systems (OARDC Led)

#### **2. Brief summary about Planned Program**

Plant programs are a substantial component of Ohio's food, fiber, and agricultural industry, providing jobs, value-added products, and a healthy supply of raw and manufactured products worldwide. This will continue to be a major focal area in 2012 -2016 with emphasis on its potential to grow Ohio's economy. Most of the world relies on a plant based-diet. To help feed the world and secure the global food system, OARDC's plant related research is targeted to, among other goals, improving both quality and quantity of food plants, for both human and livestock consumption, in order to meet society's growing demand. The program is central to the College of Food, Agricultural, and Environmental Sciences 2008 Strategic Plan that focuses on advancing education, scholarship, knowledge acquisition, and information diffusion in three signature areas: (1) food security, production, and human health; (2) environmental quality and sustainability; and (3) advanced bioenergy and biobased products. Plants are directly embedded in each of these three signature areas. This program has a 100 plus year history and will continue to be primary throughout this planning period. The faculty group working in this area defines their mission as: to obtain knowledge about plants and their uses through innovation and discovery, and then disseminate that knowledge to benefit Ohio State University, the people of Ohio, and the world. Plant programs are a major economic force in Ohio. OARDC has provided scientific leadership at all levels in this program for over a century, including the Green Revolution in Asia. The continued advancement in this Planned Program will improve the global capacity of the world to feed itself, reduce hunger within vulnerable populations, and improve regional capacity to grow much of the region's own food supply. The Plant Systems Planned Program embraces multiple levels ranging from investigations at the genetic level to studying all aspects of production and pathology. Such program positions Ohio as a major contributor to both basic and applied plant sciences, and substantially contributes to the food security at national and global levels. Ohio has consistently been a leading state in the production of corn and soybeans for both domestic and export markets. It should continue this trend throughout the second decade of the 21st century. The Green Industry is often referred to as having its roots in Ohio. Genetics research provides a foundation for the program with inquiries from the genome level through gene pool studies. Emphasis will continue to be placed on pre-harvest programs to reduce risks for producers, processors, and consumers, and ensure high productivity. Plant management systems, as well as protecting plants from other plants, animal pests, and diseases is an area of research strength with emphasis on Integrated Pest Management (IPM). Producers, processors, and distributors in this program are well organized and rely heavily on OARDC for scientific information. Over the years they have been and will continue to be actively engaged in the process of research from needs identification to summative assessments of outcomes. OARDC research is disseminated by OSU Extension.

**3. Program existence :** Mature (More than 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

<b>KA Code</b>	<b>Knowledge Area</b>	<b>%1862 Extension</b>	<b>%1890 Extension</b>	<b>%1862 Research</b>	<b>%1890 Research</b>
201	Plant Genome, Genetics, and Genetic Mechanisms	10%		10%	
202	Plant Genetic Resources	15%		15%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	0%		5%	
204	Plant Product Quality and Utility (Preharvest)	30%		20%	
205	Plant Management Systems	10%		10%	
206	Basic Plant Biology	0%		5%	
211	Insects, Mites, and Other Arthropods Affecting Plants	5%		5%	
212	Pathogens and Nematodes Affecting Plants	5%		5%	
213	Weeds Affecting Plants	5%		5%	
214	Vertebrates, Mollusks, and Other Pests Affecting Plants	5%		5%	
216	Integrated Pest Management Systems	15%		15%	
	<b>Total</b>	100%		100%	

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

## 1. Situation and priorities

Providing for the sustained and secure flow of food from the field and assuring producers, processors, distributors, and consumers that their plant-based food system is informed by the best science available is an expectation of OARDC. The science behind the system is not only critical for provisioning of food worldwide; it is also a major economic driver. Corn and soybeans collectively adds about two billion dollars to Ohio and the regional economy each year, with approximately \$600 million of soybean exports annually. As the prices increase worldwide for food and alternatives to petroleum, the return on investment will be strong. OARDC addresses direct needs of all these constituency groups by interacting with them and understanding their needs. Scientists also address needs before they ever arrive in the state, i.e. studying soybean rust and breeding Ohio varieties that have the greatest potential for resistance. There is no sector in Ohio that this Planned Program does not impact in that plant based food systems nurture the world. Much of the interactions are with organized groups of producers, processors, and consumers. Consumer demand for products is often relayed through feedback from other organized groups such as food distributors, e.g. demand for a firmer fruit. Without a growing body of knowledge to create efficiencies and security in the plant based food systems, opportunities will be missed and society will not be well served. With over one hundred years of research history, a robust body of literature, and a well-developed network of clientele, supporters, and companion agencies and organizations, including OSU Extension, OARDC is well positioned to continue to effect positive change in this Planned Program. Effective research requires a mixture of laboratory, greenhouse, controlled study fields, and on-farm research to maximize knowledge. Emerging threats and the need for a stronger and more secure food and fiber supply, as well

as an international demand to reduce world hunger, now demands planning of more advanced facilities such as a biosecurity lab and more international research programs to foster regional food security.

## **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**

The issues within this program have been identified by our stakeholder communities, including the international community, and/or via the scientific literature, thus reflecting the more important issues that warrant allocation of resources. Understanding of this Planned Program and how society utilizes and depends on the associated research are key to present and future decision-making in provisioning of food, fiber, and environmental services. All citizens directly benefit from a safe, secure, and plentiful plant based food system. It is these systems that will reduce world hunger. These lines of inquiry will provide necessary information to inform human enterprises. Research and education related to plant systems is a demand by society to meet current and future needs. It is assumed that base federal funding will continue to be available and leveraged to support this planned program and the scientific staff who carry out these lines of inquiry. Likewise it is assumed that the federal base funding will be leveraged for continuing to attract state and extramural funds.

### **2. Ultimate goal(s) of this Program**

Goals for Plant Systems production research are: generate knowledge related to plant genomes, markers, structures, and similar areas of studies commensurate with the demand of other scientists and stakeholders who will apply this knowledge to their areas of plant breeding, growth, and development; and provide at minimum one new contribution annually to the body of literature that will positively advance this area of study. Plant genetic resource research will: advance the science of germplasm preservation, acquisition, and information systems over the next ten years to the extent that the genetic resources targeted for acquisition are preserved and that targeted plant systems in Ohio and the region can be considered secure in terms of systems preservation; and enrich the gene pool and gene pool knowledge to the extent that breeding programs have the materials with the desired traits on-demand to move forward with releasing varieties, etc. Plant preharvest research will: provide the necessary quality and utility data, including cultural practices, seed quality assurance, breeding, and other biological and physical investigations necessary to support preharvest practices that achieve the prerequisite yield, disease resistance, and other characteristics to retain Ohio status as a top soybean and corn producer and to advance other desirable crops as demand evolves, e.g. substitute crops for tobacco, disease resistance organics, and crops for biobased commodities. Plant management systems research will: participate in modeling and sampling of crop data, including remote sensing, for the purpose of deriving systems that are cost effective and cost efficient for producers; evaluate production management systems, including organics, sustainable agriculture initiatives, small-scale farming/niche market systems for the purpose of increasing efficiency and effectiveness, thus making innovative farming systems more attractive to stakeholders; support biosecurity research commensurate with the overt or potential threats; support OSU

Extension's Master Gardening program by providing the green industry research necessary to advance the development of materials and field trails required to keep the program viable. Plant protection research will: employ an integrated approach to protecting plants from harmful insects and other invertebrates, pathogens, vertebrates, and weeds to the extent that the research is required to mitigate impacts that have significant negative economic or environmental consequences.

**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
2012	0.0	0.0	30.5	0.0
2013	0.0	0.0	30.5	0.0
2014	0.0	0.0	30.5	0.0
2015	0.0	0.0	30.5	0.0
2016	0.0	0.0	30.5	0.0

**V(F). Planned Program (Activity)**

**1. Activity for the Program**

On -going research activities to advance plant systems goals include both basic and applied research. Both laboratory and multiple field sites/research stations are available throughout state to permit data gathering and to continue long - term experiments, such as commodity yeilds. On-farm research takes place as do national and international studies. All functional laboratories and sites are improved over time as program need resources available warrant. OARDC faculty and staff engage in appropriate levels of outreach, engagement, and consultation, with both internal stakeholders, such as fellow extension personnel, and with external stakeholders.

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

Extension	
Direct Methods	Indirect Methods
<ul style="list-style-type: none"> <li>● Education Class</li> <li>● Workshop</li> <li>● Demonstrations</li> </ul>	<ul style="list-style-type: none"> <li>● Public Service Announcement</li> <li>● Newsletters</li> </ul>

**3. Description of targeted audience**

Targeted audiences include, but are not limited to: specific individuals or groups who have expressed a need for plant systems information that is to be derived through new research, extracted from on-going research, or is derived from scientific literature. Often those requests are communicated to OARDC by an intermediary such as a staffer at a USDA office, NRCS, or a county extension agent; fellow agencies or support organizations who will not only use the information but will also be brokers of that information, including embedding it into groups to encourage change; populations who have not requested the

information but will likely benefit from that information, e.g. home gardeners; other scientists and scientific groups; political entities; extension personnel; students for pre-school to post doctorate studies; and news organizations.

### **V(G). Planned Program (Outputs)**

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
  - Direct Adult Contacts
  - Indirect Adult Contacts
  - Direct Youth Contacts
  - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

### **V(H). State Defined Outputs**

#### **1. Output Measure**

- Number of graduate students completed

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

**V(I). State Defined Outcome**

O. No	Outcome Name
1	Meet or exceed the demand of fellow scientists and stakeholders within the next ten years for materials relating to plant genetics and plant breeding technologies, including identification of molecular markers for elite germplasms.
2	Provide new contributions to the body of literature that will positively advance plant genetics, e.g. molecular techniques and materials to aid in low temperature plant tolerance research.
3	Advance germplasm science over the next ten years to the extent that the genetic resources targeted for acquisition are preserved and can be considered secure in terms of systems preservation, e.g. short season crops or for studying rice pathogens.
4	Enrich the gene pool, and knowledge thereof, to meet identified stakeholder turf needs for nutrient uptake efficient materials, turf with greater traction, etc.
5	Enrich the gene pool and knowledge thereof in disease/pest resistance, and gene recombination and interaction studies.
6	Enrich the gene pool and knowledge thereof in disease resistance of rootstocks such as for apple trees and green industry, and for resistance to plant stresses, e.g. discoloration in products such as tomatoes reducing a \$60 million loss annually in tomato industry.
7	Enrich the gene pool and knowledge thereof in the areas of molecular studies to better understand how immune systems in plants inhibit diseases and how bacteria perturb the immune system.
8	Annually provide adequate preharvest research findings, including field trial data, to support Ohio's status as a top soybean and corn producer
9	Release or support release by others of special cultivars to enhance Ohio agriculture, e.g. grapes to replace tobacco in southeastern Ohio, low maintenance turf grass, nitrogen uptake efficient crops including foliar based fertilization, field crop cultivars.
10	Continually participate in and promote the development and timely release of modeling/forecasting programs that are cost effective and cost efficient for producers. e.g. WEEDCAST.
11	Annually contribute to and report a basic or applied understanding of IPM, including all physical, biological, and chemical components of the plant system, to reduce environmental stresses, improve production, and lower costs when employed.

**Outcome # 1**

**1. Outcome Target**

Meet or exceed the demand of fellow scientists and stakeholders within the next ten years for materials relating to plant genetics and plant breeding technologies, including identification of molecular markers for elite germplasms.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:0                      2013:1                      2014:0                      2015:0                      2016:0**

**3. Associated Knowledge Area(s)**

- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 202 - Plant Genetic Resources
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 2**

**1. Outcome Target**

Provide new contributions to the body of literature that will positively advance plant genetics, e.g. molecular techniques and materials to aid in low temperature plant tolerance research.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:0                      2013:0                      2014:0                      2015:1                      2016:0**

**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 # 3**

**1. Outcome Target**

Advance germplasm science over the next ten years to the extent that the genetic resources targeted for acquisition are preserved and can be considered secure in terms of systems preservation, e.g. short season crops or for studying rice pathogens.

**2. Outcome Type : Change in Knowledge Outcome Measure**

<b>2012:0</b>	<b>2013:0</b>	<b>2014:0</b>	<b>2015:1</b>	<b>2016:0</b>
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**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 # 4**

**1. Outcome Target**

Enrich the gene pool, and knowledge thereof, to meet identified stakeholder turf needs for nutrient uptake efficient materials, turf with greater traction, etc.

**2. Outcome Type : Change in Knowledge Outcome Measure**

<b>2012:0</b>	<b>2013:1</b>	<b>2014:0</b>	<b>2015:0</b>	<b>2016:0</b>
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**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
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 213 - Weeds Affecting Plants
- 214 - Vertebrates, Mollusks, and Other Pests Affecting Plants

- 216 - Integrated Pest Management Systems

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 5**

**1. Outcome Target**

Enrich the gene pool and knowledge thereof in disease/pest resistance, and gene recombination and interaction studies.

**2. Outcome Type : Change in Knowledge Outcome Measure**

<b>2012:1</b>	<b>2013:0</b>	<b>2014:0</b>	<b>2015:0</b>	<b>2016:0</b>
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**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
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 213 - Weeds Affecting Plants
- 214 - Vertebrates, Mollusks, and Other Pests Affecting Plants
- 216 - Integrated Pest Management Systems

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 6**

**1. Outcome Target**

Enrich the gene pool and knowledge thereof in disease resistance of rootstocks such as for apple trees and green industry, and for resistance to plant stresses, e.g. discoloration in products such as tomatoes reducing a \$60 million loss annually in tomato industry.



**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:0                      2013:1                      2014:0                      2015:0                      2016:0**

**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
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 213 - Weeds Affecting Plants
- 214 - Vertebrates, Mollusks, and Other Pests Affecting Plants
- 216 - Integrated Pest Management Systems

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 7**

**1. Outcome Target**

Enrich the gene pool and knowledge thereof in the areas of molecular studies to better understand how immune systems in plants in inhibit diseases and how bacteria perturb the immune system.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:1                      2013:1                      2014:0                      2015:1                      2016:0**

**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
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 213 - Weeds Affecting Plants

- 214 - Vertebrates, Mollusks, and Other Pests Affecting Plants
- 216 - Integrated Pest Management Systems

#### 4. Associated Institute Type(s)

- 1862 Research

### Outcome # 8

#### 1. Outcome Target

Annually provide adequate preharvest research findings, including field trial data, to support Ohio's status as a top soybean and corn producer

#### 2. Outcome Type : Change in Knowledge Outcome Measure

2012:1	2013:1	2014:1	2015:1	2016:0
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#### 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
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 213 - Weeds Affecting Plants
- 214 - Vertebrates, Mollusks, and Other Pests Affecting Plants
- 216 - Integrated Pest Management Systems

#### 4. Associated Institute Type(s)

- 1862 Research

### Outcome # 9

#### 1. Outcome Target

Release or support release by others of special cultivars to enhance Ohio agriculture, e.g. grapes to replace tobacco in southeastern Ohio, low maintenance turf grass, nitrogen uptake efficient crops including foliar based fertilization, field crop cultivars.

**2. Outcome Type : Change in Action Outcome Measure**

**2012:0                      2013:1                      2014:0                      2015:1                      2016:0**

**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
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 213 - Weeds Affecting Plants
- 214 - Vertebrates, Mollusks, and Other Pests Affecting Plants
- 216 - Integrated Pest Management Systems

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 10**

**1. Outcome Target**

Continually participate in and promote the development and timely release of modeling/forecasting programs that are cost effective and cost efficient for producers, e.g. WEEDCAST.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:0                      2013:0                      2014:0                      2015:1                      2016:0**

**3. Associated Knowledge Area(s)**

- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 213 - Weeds Affecting Plants
- 214 - Vertebrates, Mollusks, and Other Pests Affecting Plants
- 216 - Integrated Pest Management Systems

#### 4. Associated Institute Type(s)

- 1862 Research

#### Outcome # 11

##### 1. Outcome Target

Annually contribute to and report a basic or applied understanding of IPM, including all physical, biological, and chemical components of the plant system, to reduce environmental stresses, improve production, and lower costs when employed.

##### 2. Outcome Type : Change in Knowledge Outcome Measure

2012:1	2013:1	2014:1	2015:1	2016:0
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##### 3. Associated Knowledge Area(s)

- 202 - Plant Genetic Resources
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 213 - Weeds Affecting Plants
- 214 - Vertebrates, Mollusks, and Other 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**

Climatic extremes, climate change, pests, weeds, and diseases can impact outcomes within plant systems. As the food, fiber, and environmental economy adjust to the global marketplace, in conjunction with public policy shifts, regulations, and shifts in demand, outcomes will be impacted. Production agriculture is most sensitive to these shifts. Formative evaluation though can lessen the burden by seeking feedback throughout the life of the program. Factors such as the availability of base funding to ensure a core faculty and staff, availability of extramural funds, and programmatic demands that often exceed resources, will affect outcomes.

**V(K). Planned Program - Planned Evaluation Studies**

**Description of Planned Evaluation Studies**

{NO DATA ENTERED}

## **V(A). Planned Program (Summary)**

### **Program # 9**

#### **1. Name of the Planned Program**

Animals Systems (OARDC Led)

#### **2. Brief summary about Planned Program**

The food animal industry in Ohio is a key contributor to the food, agricultural, and environmental economy and will be throughout this 2012 -2016 planning period and well beyond. Developed nations and many rapidly growing nations, such as India and China, are now demanding more food animal products. To meet the demand at home and abroad, animal systems research remain an important Planned Program. The faculty group working in this area defined their mission as: to discover and communicate knowledge about animals and their products. This program is directed to the students of The Ohio State University, the citizens of Ohio and other parts of the world, the scientific community, stakeholders who are interested in animals used for food and fiber production, recreation, and companion purposes. Research performed in 2008 by Battelle, sponsored by the Ohio Soybean Council, shows the livestock sector having the following Ohio economic impacts: \$3.6 billion in Ohio economic output; 45,692 jobs in the state directly or indirectly related the livestock sector; and generation of more than \$396 million annually in personal income for Ohioans. This program is central to the College of Food, Agricultural, and Environmental Sciences 2008 Strategic Plan that focuses on advancing education, scholarship, knowledge acquisition, and information diffusion in three signature areas : (1) food security, production, and human health; (2) environmental quality and sustainability; and (3) advanced bioenergy and biobased products. The food animal industry continually grows. For example, per capita consumption of chicken and turkey has increased dramatically since the 1970s. Nationally, chicken consumption has increased from 40 pounds per person in 1970 to present day 80 plus pounds per person. Turkey consumption has risen from 8 pounds in 1970 to current consumption of 17 plus pounds person. Breeders are focused on maximizing growth with an emphasis on the breast muscle. Every percent improvement in breast muscle yield is worth \$100 plus million to the U.S. turkey industry, and is worth over \$300 plus million to the U.S. broiler industry. OARDC scientists have provided a significant portion of research over the years to support this growth. OARDC is heavily invested in programs, facilities, and stakeholder networks at the local, state, regional and national levels that support this planned program. The program consists of multiple levels of research ranging from investigations at the genetic level to studying all aspects of food animal production, including aquaculture and new initiatives such as goat meat production for a new immigrant population. Such program positions Ohio as a major contributor to both basic and applied animal sciences, and substantially contributes to the food security at national and global levels. OARDC scientist have provided leadership at all geographical levels, and worldwide for the past half a century. Genetic research provides a foundation for the program with inquiries from the genome level through gene pool studies. Nutrition and reproduction are major areas of emphasis demanded by stakeholders and by the state of academic understanding of the food animal system. Emphasis will continue to be placed on pre-harvest programs to reduce risks to producers, processors, and consumers, and ensure high productivity of quality products. Producers, processors, and distributors in this program are well organized and rely heavily on OARDC for scientific information. The organization will continue their 100 plus year history and continue actively engaged in the process of research from needs identification to summative assessments of outcomes. OARDC research is widely disseminated by OSU Extension, ensuring that research is distributed in a timely manner that leads to planned impacts within appropriate stakeholder groups.

**3. Program existence :** Mature (More than 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	20%		15%	
302	Nutrient Utilization in Animals	20%		15%	
303	Genetic Improvement of Animals	10%		10%	
304	Animal Genome	10%		5%	
305	Animal Physiological Processes	0%		15%	
306	Environmental Stress in Animals	0%		5%	
307	Animal Management Systems	10%		10%	
308	Improved Animal Products (Before Harvest)	20%		15%	
311	Animal Diseases	10%		10%	
	<b>Total</b>	100%		100%	

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

**1. Situation and priorities**

Providing for the sustained and secure flow of food animals for producers, processors, distributors, and consumers and knowledge that their animal-based food system is informed by the best science available are continuing expectations of OARDC. The science behind the system is not only critical for provisioning the food worldwide; it is also a major economic driver in Ohio. OARDC addresses direct needs of all their constituency groups by interacting with them and understanding their needs. Scientists also address needs before they ever arrive in the state, e.g. studying potentially infectious animal diseases. Much of the interactions are with organized groups of producers, processors, distributors, and consumers. Consumer demand for products is often relayed through feedback from other organized groups such as food distributors, e.g. demand for more tender and more marbled beef. Without a growing body of knowledge to create efficiencies and security in the animal based food systems, opportunities will be missed and society will not be well served. With over one hundred years of research history, a robust body of literature, and a well-developed network of clientele, supporters and companion agencies and organizations, including OSU Extension. OARDC is well positioned to continue to affect positive change in this Planned Program.

**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**

Understanding the basic and applied science related to how animal systems are maintained and managed, and how food and the associated economies function, meet society's overt and latent demands for a secure supply of food animals. As we address problems and needs within our stakeholder communities, the organization (OARDC and OSU Extension) becomes better prepared to take advantage of emerging opportunities or to more rapidly address problems within these areas. Other key assumptions are: the issues within this program have been identified by our stakeholder communities, and/or via the scientific literature, reflect society's more important issues, and warrant allocation of resources; the understanding of this planned program and how society utilizes and depends on the associated research is key to present and future decision-making in provisioning of food animals; all citizens directly or indirectly benefit from a safe, secure, and plentiful animal based food system. These lines of inquiry will provide necessary data to inform human enterprises; research and education related to food animal systems is a demand by society needed to meet current and future needs; and base federal funding will continue to be available and leveraged to support this planned program and the scientific staff who carry out these lines of inquiry. Likewise it is assumed that the federal base funding will be leverage for continuing to attract state and extramural funds.

### **2. Ultimate goal(s) of this Program**

Animal production research will continue to work with all agriculturally important animals in Ohio to enhance reproductive performance that are both effective and economically efficient in meeting commensurate demands of the industry and consumers. Nutrient utilization research will continue to provide the necessary research to enhance nutrient utilization for the purpose of production efficiency, economic viability, competitiveness, and animal health within the industry and provide consumers with greater value and quality at reduced environmental costs. Genetic research, including genomics, will continue to work with our stakeholders to better understand and provide the genetic improvement information, including work at the molecular level, that is in current demand, or that is emerging as a potential demand. Animal management research will: focus on improving management systematics for multiple farm types including organics, and will include modeling, decision-making, and alternative management strategies. Preharvest research will continue to address demand from stakeholders for information to aid in improving the quantity and quality of animal products in a cost effective, environmentally friendly manner that is socially acceptable. Research related to animal protection will continue to focus primarily on animal diseases, both present ones and those that have likelihood of impacting this geographic region, to ensure that society has a safe and secure animal based food supply and that human and animal health, business enterprises, and environmental and food security are not compromised, locally and globally.

## **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
2012	0.0	0.0	16.0	0.0
2013	0.0	0.0	16.0	0.0
2014	0.0	0.0	16.0	0.0
2015	0.0	0.0	16.0	0.0
2016	0.0	0.0	16.0	0.0

**V(F). Planned Program (Activity)**

**1. Activity for the Program**

On -going research activities to advance animal and global food security goals include both basic and applied research. Laboratory, animal enclosures, farms, and multiple field sites/research stations are available throughout state to permit data gathering and to continue long - term experiments. Ohio on-farm research takes place as do national and international studies. Effective research requires a mixture of laboratory, animal enclosed, and on-farm research to maximize knowledge. Emerging threats now require more advanced facilities such as a biosecurity lab, particularly needed in the study infectious animal diseases. OARDC will begin construction of a bio- security lab in 2010. All functional laboratories and sites are improved over time as program need warrants. OARDC faculty and staff engage in appropriate levels of outreach, engagement, and consultation, with both internal stakeholders such as fellow extension personnel, and with external stakeholders

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

**Extension**

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> <li>● Education Class</li> <li>● Workshop</li> <li>● Demonstrations</li> </ul>	<ul style="list-style-type: none"> <li>● Public Service Announcement</li> <li>● Newsletters</li> </ul>

**3. Description of targeted audience**

Targeted audiences include, but are not limited to: specific individuals or groups who have expressed a need for food animal systems information that is to be derived through new research, extracted from on-going research, or is derived from scientific literature. Often those requests are communicated to OARDC by an intermediary such as a staffer at a USDA office, NRCS, Ohio Department of Agriculture, or a county extension agent; fellow agencies or support organizations who will not only use the information but will also be brokers of that information, including embedding it into groups to encourage change; populations who have not requested the information but will likely benefit from that information, e.g. small or recreational farmers; other scientists and scientific groups; political entities; extension personnel; students for pre-school to post doctorate studies; news organizations; and business groups such as Farm Bureau or commodity groups.

### **V(G). Planned Program (Outputs)**

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
    - Direct Adult Contacts
    - Indirect Adult Contacts
    - Direct Youth Contacts
    - Indirect Youth Contact
  - Number of patents submitted
  - Number of peer reviewed publications
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

### **V(H). State Defined Outputs**

#### **1. Output Measure**

- Number of graduate students completed.
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

**V(I). State Defined Outcome**

O. No	Outcome Name
1	Improve reproduction efficiency and enhanced application of new technologies over the next five years to fully meet the competitive demands faced by OARDC's stakeholders in areas such as early maturation, estrus, fertility, and ovulation
2	Increase nutrition utilization for the purpose of increased growth and quality of products commensurate with consumer demand, as well as nutrition utilization, performance, and efficiency to the point that savings will off-set increases in costs of animal feedstocks
3	Show incremental gains annually in dietary research to increase utilization of food stocks (e.g. via better understanding of protozoal ecology), increase bioavailability of nutrients including trace minerals, and protect animal and human health
4	Meet the demand of fellow scientists and stakeholders within ten years for materials relating to genetics and breeding, including id of molecular markers for improved animal health and reproductively, and increased quality and quantity of products
5	Provide new contributions to the body of literature that will positively food animal genetics, e.g. molecular techniques and materials to aid in identifying genetic codes of bacteria in that breaks down cellulose
6	Improve management for multiple animal farm types, including organics, that will produce higher yields for and lower costs to the producer and consumer
7	Advance preharvest research over five years to the extent that new technologies are being adopted and showing profitability in area such as improved muscle growth, quality of meat, tenderness, lower fat in dairy products, etc.
8	Animal disease researchers will continue to serve on first responder teams when stakeholders have an immediate disease problem
9	Animal disease researchers will provide the necessary research to inform producers in a timely manner how to protect against known and present diseases, e.g. bovine mastitis
10	Animal disease researchers will advance the research frontiers in emerging disease investigations to the extent that OARDC continues to serve as a center for excellence

**Outcome # 1**

**1. Outcome Target**

Improve reproduction efficiency and enhanced application of new technologies over the next five years to fully meet the competitive demands faced by OARDC's stakeholders in areas such as early maturation, estrus, fertility, and ovulation

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:1                      2013:1                      2014:0                      2015:1                      2016:0**

**3. Associated Knowledge Area(s)**

- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 304 - Animal Genome
- 305 - Animal Physiological Processes
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 2**

**1. Outcome Target**

Increase nutrition utilization for the purpose of increased growth and quality of products commensurate with consumer demand, as well as nutrition utilization, performance, and efficiency to the point that savings will off-set increases in costs of animal feedstocks

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:1                      2013:0                      2014:0                      2015:0                      2016:0**

**3. Associated Knowledge Area(s)**

- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 304 - Animal Genome
- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems

- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases

#### 4. Associated Institute Type(s)

- 1862 Research

### Outcome # 3

#### 1. Outcome Target

Show incremental gains annually in dietary research to increase utilization of food stocks (e.g. via better understanding of protozoal ecology), increase bioavailability of nutrients including trace minerals, and protect animal and human health

#### 2. Outcome Type : Change in Knowledge Outcome Measure

2012:0	2013:1	2014:0	2015:0	2016:0
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#### 3. Associated Knowledge Area(s)

- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 305 - Animal Physiological Processes
- 307 - Animal Management Systems
- 311 - Animal Diseases

#### 4. Associated Institute Type(s)

- 1862 Research

### Outcome # 4

#### 1. Outcome Target

Meet the demand of fellow scientists and stakeholders within ten years for materials relating to genetics and breeding, including id of molecular markers for improved animal health and reproductively, and increased quality and quantity of products

#### 2. Outcome Type : Change in Knowledge Outcome Measure

2012:1	2013:0	2014:0	2015:1	2016:0
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#### 3. Associated Knowledge Area(s)

- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals

- 304 - Animal Genome
- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases

#### 4. Associated Institute Type(s)

- 1862 Research

### Outcome # 5

#### 1. Outcome Target

Provide new contributions to the body of literature that will positively food animal genetics, e.g. molecular techniques and materials to aid in identifying genetic codes of bacteria in that breaks down cellulose

#### 2. Outcome Type : Change in Action Outcome Measure

2012:0	2013:1	2014:0	2015:0	2016:0
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#### 3. Associated Knowledge Area(s)

- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 304 - Animal Genome
- 305 - Animal Physiological Processes
- 307 - Animal Management Systems

#### 4. Associated Institute Type(s)

- 1862 Research

### Outcome # 6

#### 1. Outcome Target

Improve management for multiple animal farm types, including organics, that will produce higher yields for and lower costs to the producer and consumer

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:1                      2013:0                      2014:0                      2015:1                      2016:0**

**3. Associated Knowledge Area(s)**

- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 304 - Animal Genome
- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 7**

**1. Outcome Target**

Advance preharvest research over five years to the extent that new technologies are being adopted and showing profitability in area such as improved muscle growth, quality of meat, tenderness, lower fat in dairy products, etc.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:1                      2013:0                      2014:0                      2015:1                      2016:0**

**3. Associated Knowledge Area(s)**

- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 304 - Animal Genome
- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 8**

**1. Outcome Target**

Animal disease researchers will continue to serve on first responder teams when stakeholders have an immediate disease problem

**2. Outcome Type : Change in Knowledge Outcome Measure**

<b>2012:1</b>	<b>2013:1</b>	<b>2014:1</b>	<b>2015:1</b>	<b>2016:0</b>
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**3. Associated Knowledge Area(s)**

- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 311 - Animal Diseases

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 9**

**1. Outcome Target**

Animal disease researchers will provide the necessary research to inform producers in a timely manner how to protect against known and present diseases, e.g. bovine mastitis

**2. Outcome Type : Change in Action Outcome Measure**

<b>2012:0</b>	<b>2013:1</b>	<b>2014:0</b>	<b>2015:1</b>	<b>2016:0</b>
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**3. Associated Knowledge Area(s)**

- 305 - Animal Physiological Processes
- 307 - Animal Management Systems
- 311 - Animal Diseases

**4. Associated Institute Type(s)**

- 1862 Research



**Outcome # 10**

**1. Outcome Target**

Animal disease researchers will advance the research frontiers in emerging disease investigations to the extent that OARDC continues to serve as a center for excellence

**2. Outcome Type : Change in Knowledge Outcome Measure**

<b>2012:0</b>	<b>2013:0</b>	<b>2014:0</b>	<b>2015:1</b>	<b>2016:0</b>
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**3. Associated Knowledge Area(s)**

- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 304 - Animal Genome
- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases

**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**

Climatic extremes, coupled with animal diseases that are often climate related, can impact outcomes. Public policy shifts, regulations, and shifts in demand will be impact outcomes. Human values and environmental sensitivities of the populace to animal production and processing are also external factors that affect outcomes. Formative evaluation though can lessen the burden by seeking feedback throughout the life of the program. Factors such as the availability of base funding to ensure a core

faculty and staff, availability of extramural funds, and programmatic demands that often exceed resources, all will affect outcomes.

**V(K). Planned Program - Planned Evaluation Studies**

**Description of Planned Evaluation Studies**

{NO DATA ENTERED}

## **V(A). Planned Program (Summary)**

### **Program # 10**

#### **1. Name of the Planned Program**

Food, Agricultural, and Biological Engineering Systems (OARDC Led)

#### **2. Brief summary about Planned Program**

The research and extension activities of those working in the Food, Agricultural, and Biological Engineering Planned Program underpins the work of all units within the college and has impact from local to the international arena. The technologies and engineering solutions from this Planned Program support food safety and food security research, climate change initiatives, sustainable energy efforts, as well as research programs that are seeking to advance human health and advance safety in agricultural work places. This Planned Program will continue to support other CFAES programs and advance the collective mission of the organization throughout this planning period. Even though their Wooster campus facilities were destroyed by the 2010 tornado, programmatic recovery is expected by the time this 2012 -2016 planning period begins. The faculty group working in this area defined their goal as: to advance the science and application of engineering systems involving food, agriculture, environment and construction. This program is dedicated to advancing science, teaching principles and application, and disseminating knowledge of engineering and construction needed to efficiently produce, distribute, and process biological products (such as food, feed, fiber, and fuel) while conserving natural resources, preserving environmental quality, and ensuring the health and safety of people. This line of research is highly ranked nationally and has a history of innovation and leadership. Likewise it is central to the College of Food, Agricultural, and Environmental Sciences 2008 Strategic Plan that focuses on advancing education, scholarship, knowledge acquisition, and information diffusion in three signature areas: (1) food security, production, and human health; (2) environmental quality and sustainability; and (3) advanced bioenergy and biobased products. Agriculture leads the nation in occupational unintentional-injury death rates in the U. S. OARDC research tracks the agents, nature of the fatal incident, and demographics. Surveillance of agricultural work related fatalities are necessary to guide both present and future research and outreach initiatives. Surveillance of agricultural work related fatalities provide guidance to direct both present and future research and outreach initiatives. Gathered agricultural fatal injury data are being incorporated into a central database; analyzed on a yearly basis; and trends determined over a five-year period. Data are being posted to a website for use by county extension agents and other professionals. Data and emerging trends appear in Ohio research reports. Research related to structures and facilities is heavily focused on greenhouse technologies for the benefit of stakeholders and fellow research units. With the loss of most of the greenhouses on the Wooster campus in the 2010 tornado, all new greenhouses have or will be installed and will serve as research subjects. Additional research in broader areas of structures and facilities is often carried out at the request of OSU Extension, USDA/USDI partners, state partners such Ohio Department of Agriculture, and local entities such as Soil and Water Conservation Districts. Systems engineering and development of equipment and associated methodologies for industry efficiency are important lines of inquiry given the need to reduce costs. Such research will continue to seek to advance the competitiveness of the various industries informed by OARDC research and OSU Extension programming. Research emphasis will continue to be placed on waste disposal for the food and fiber industry. Where practical this waste stream will yield bioenergy as is being demonstrated in the Wooster campus BiOhio Research Park. Given Ohio has a high water table and is a state in which the rural urban interface is a point of management concern, waste from animal industries and food processing are primary focal areas. Engineering solutions are also sought to minimize air quality impacts from associated industries. Without proper disposal systems, both risk from regulatory actions and negative public perception, where human and environmental health issues arise, are issues of concern. Through partnerships within the College of FAES, across the university, and throughout the stakeholder community, scientists and staff will continue working in this area effecting changes that are responsive to

meeting stated needs. Additionally this line of research will continue to necessary to take advantage of emerging opportunities that have been identified in CFAES, NIFA, and APLU/ESCOP planning documents.

**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	20%		20%	
402	Engineering Systems and Equipment	30%		25%	
403	Waste Disposal, Recycling, and Reuse	50%		25%	
404	Instrumentation and Control Systems	0%		10%	
405	Drainage and Irrigation Systems and Facilities	0%		15%	
723	Hazards to Human Health and Safety	0%		5%	
	<b>Total</b>	100%		100%	

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

**1. Situation and priorities**

Providing for the sustained and secure flow of food and fiber to/from producers, processors, distributors, and consumers, and assuring that their interests are informed by the best engineering science available are continuing expectations of OARDC. The engineering science behind the food and fiber systems is critical for provisioning of food worldwide. Engineering directly supports OARDC goals of production efficiency, economic viability, environmental stewardship, and social acceptability of practices introduced. OARDC addresses direct needs of all their constituency groups by interacting with them and understanding their needs. Much of engineering's interactions are with fellow research and extension units, and with organized groups of producers, processors, and consumers. Demand for their expertise and the processes and products generated are often in conjunction with or brokered through other academic units or support agencies and organizations. Without a growing body of engineering knowledge to create efficiencies and security in the food systems, opportunities will be missed and society will not be well served. With a long research history, a robust body of literature, and a well-developed network of clientele, supporters and companion agencies and organizations, including OSU Extension, OARDC is well positioned to continue to effect positive change by supporting and advancing food, agricultural and biological engineering sciences. Effective research requires a mixture of laboratory, animal enclosures, plant support facilities, and on-farm research support facilities and engineered processes, to maximize knowledge. Faculty and staff in this program provide research that leads to state of the art systems and facilities. Likewise, they provide the knowledge and technologies needed by stakeholders to make

decisions regarding adoption of state of the art facilities and processes. Emerging threats now demand the building of advanced facilities such as biosecurity laboratories, such as the one being constructed by OARDC on the Wooster campus; systems and facilities engineers will continue to be critical to such planning efforts.

## **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**

A client oriented research and development program by food, agricultural and biological engineers is critical to meeting society's overt and latent demands in this area. As we address problems and needs within our stakeholder communities, the organization (OARDC and OSU Extension) become better prepared to take advantage of emerging opportunities or to more rapidly address problems within these areas. Other key assumptions are: The issues within this program have been identified by our stakeholder communities, and/or via the scientific literature, reflect the more important issues, and warrant allocation of resources; The understanding of this planned program and how society utilizes and depends on the associated research is key to present and future decision-making in provisioning of food, fiber, and environmental services; all citizens directly or indirectly benefit from a safe, secure, and plentiful food system supply support by state of the art engineering; these lines of inquiry will provide necessary to inform human enterprises; engineering research and education are demands by society needed to meet current and future needs; and base federal funding will continue to be available and leveraged to support this planned program and the scientific staff who carry out the lines of inquiry noted within the knowledge areas for this program. Likewise it is assumed that the federal base funding will be leverage for continuing to attract state and extramural funds.

### **2. Ultimate goal(s) of this Program**

For 2012 -2016 engineering structures and facilities research will: carry out investigations leading to the design of facilities and associated engineered process necessary to support the food, fiber, agricultural, and environmental needs of stakeholders and fellow research units. Engineering systems and equipment research will: help develop unique systems for converting biobased products into sustainable energy and advanced materials; develop enhanced systems to support integrated plant growth systems (e.g. fertigation, monitoring, control); improve systems to aid small farmers in taking advantage of alternatives to traditional commodity crops, e.g. hydroponics for vegetables and flowers; improve mechanical devices and instrumentation needed by stakeholders such as improved pesticide applicators, including biological pesticides; develop improved systems to aid in meeting new or yet to emerge or novel needs such as bioreactors to treat landfill waste biologically or reduction of axle loads of farm equipment to prevent compaction of agricultural soils. Waste disposal engineering research will: inform the process of collecting, storing, processing, and distributing waste products from plant and animal agriculture; advance study and modeling of state of the art integrated systems; join with ecological engineers to determine improved strategies for ecological based engineered systems for waste management, e.g. constructed

multistage farm ditches; carry out studies to determine and aid rural residents, businesses, and industries in utilizing effective onsite waste disposal systems. The program will also increase the understanding and mitigation of hazards to human health related to accidents and exposure to safety risks within the agriculture and natural resource sectors. Goal attainment through this 2016 planning period has strong potential in the Ohio economic recovery and job creation efforts.

**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
2012	0.0	0.0	4.0	0.0
2013	0.0	0.0	4.0	0.0
2014	0.0	0.0	4.0	0.0
2015	0.0	0.0	4.0	0.0
2016	0.0	0.0	4.0	0.0

**V(F). Planned Program (Activity)**

**1. Activity for the Program**

Engineering research activities to advance OARDC goals will continue to include both basic and applied research. Laboratories, construction sites, farms, a research park, and multiple field sites/research stations are available throughout state to permit data gathering and to continue long - term activities. All functional laboratories and sites are improved over time as program need warrants. OARDC faculty and staff engage in appropriate levels of outreach, engagement, and consultation, with both internal stakeholders such as fellow extension personnel, and with external stakeholders.

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

Extension	
Direct Methods	Indirect Methods
<ul style="list-style-type: none"> <li>● Education Class</li> <li>● Workshop</li> <li>● Demonstrations</li> </ul>	<ul style="list-style-type: none"> <li>● Public Service Announcement</li> <li>● Newsletters</li> </ul>

**3. Description of targeted audience**

Targeted audiences include, but not limited to: specific individuals or groups who have expressed a need for engineering information that is to be derived through new research, extracted from on-going research, or is derived from scientific literature. Often those requests are communicated to OARDC by an intermediary such as a staffer at a USDA office, NRCS, Ohio Department of Agriculture, Soil and Water Conservation Districts or a county extension agent; fellow academic units that rely on engineers to create systems and processes needed to support not only the research, but also the adoption of the research findings by stakeholders fellow agencies or support organizations who will not only use the information but

will also be brokers of that information, including embedding it into groups to encourage change; populations who have not requested the information but will likely benefit from that information, e.g. recreational animal owners; other scientists and scientific groups; political entities; extension personnel; students for pre-school to post doctorate studies; news organizations; and business groups such as small town administrators, county commissioners, or commodity groups.

### **V(G). Planned Program (Outputs)**

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
  - Direct Adult Contacts
  - Indirect Adult Contacts
  - Direct Youth Contacts
  - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

### **V(H). State Defined Outputs**

#### **1. Output Measure**

- number of graduate students completed

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

**V(I). State Defined Outcome**

O. No	Outcome Name
1	Provide appropriate facilities design and engineering processes commensurate with stakeholders demand, including fellow research units demands, to the extent that they have all the information necessary for making adoption decisions
2	Develop enhanced systems to support integrated plant growth systems that will annually result in increased productivity at reduced costs for the industry
3	Improve systems to that will permit small farmers to take advantage of alternatives to traditional commodity crops at a rate commensurate with demand
4	Improve mechanical devices and instrumentation needed by stakeholders
5	Develop improved systems to aid in meeting new or yet to emerge or novel needs
6	Advance development of state of the art integrated waste management systems to the extent that OARDC and Ohio are viewed as one of the top ten programs/states in this area nationally
7	Advance the knowledge of ecological based engineered systems for waste management to the extent that, where cost effective and appropriate, they will be adopted over mechanical systems
8	Aid rural stakeholders with onsite waste disposal systems to the extent that all rural Ohio onsite waste management systems could meet state standards
9	Reduce through research, development, and outreach the negative impact of farm-, recreation-, or industry-related accidents within agriculture and natural resources.



**Outcome # 1**

**1. Outcome Target**

Provide appropriate facilities design and engineering processes commensurate with stakeholders demand, including fellow research units demands, to the extent that they have all the information necessary for making adoption decisions

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:1                      2013:0                      2014:0                      2015:0                      2016:0**

**3. Associated Knowledge Area(s)**

- 401 - Structures, Facilities, and General Purpose Farm Supplies
- 402 - Engineering Systems and Equipment
- 403 - Waste Disposal, Recycling, and Reuse
- 404 - Instrumentation and Control Systems
- 405 - Drainage and Irrigation Systems and Facilities

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 2**

**1. Outcome Target**

Develop enhanced systems to support integrated plant growth systems that will annually result in increased productivity at reduced costs for the industry

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:1                      2013:0                      2014:0                      2015:0                      2016:0**

**3. Associated Knowledge Area(s)**

- 401 - Structures, Facilities, and General Purpose Farm Supplies
- 402 - Engineering Systems and Equipment
- 403 - Waste Disposal, Recycling, and Reuse
- 404 - Instrumentation and Control Systems
- 405 - Drainage and Irrigation Systems and Facilities

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 3**

**1. Outcome Target**

Improve systems to that will permit small farmers to take advantage of alternatives to traditional commodity crops at a rate commensurate with demand

**2. Outcome Type : Change in Knowledge Outcome Measure**

<b>2012:0</b>	<b>2013:0</b>	<b>2014:2</b>	<b>2015:0</b>	<b>2016:0</b>
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**3. Associated Knowledge Area(s)**

- 401 - Structures, Facilities, and General Purpose Farm Supplies
- 402 - Engineering Systems and Equipment
- 403 - Waste Disposal, Recycling, and Reuse
- 404 - Instrumentation and Control Systems
- 405 - Drainage and Irrigation Systems and Facilities

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 4**

**1. Outcome Target**

Improve mechanical devices and instrumentation needed by stakeholders

**2. Outcome Type : Change in Knowledge Outcome Measure**

<b>2012:1</b>	<b>2013:0</b>	<b>2014:0</b>	<b>2015:1</b>	<b>2016:0</b>
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**3. Associated Knowledge Area(s)**

- 401 - Structures, Facilities, and General Purpose Farm Supplies
- 402 - Engineering Systems and Equipment
- 403 - Waste Disposal, Recycling, and Reuse
- 404 - Instrumentation and Control Systems
- 405 - Drainage and Irrigation Systems and Facilities

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 5**

**1. Outcome Target**

Develop improved systems to aid in meeting new or yet to emerge or novel needs

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:1                      2013:1                      2014:0                      2015:0                      2016:0**

**3. Associated Knowledge Area(s)**

- 401 - Structures, Facilities, and General Purpose Farm Supplies
- 402 - Engineering Systems and Equipment
- 403 - Waste Disposal, Recycling, and Reuse
- 404 - Instrumentation and Control Systems
- 405 - Drainage and Irrigation Systems and Facilities

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 6**

**1. Outcome Target**

Advance development of state of the art integrated waste management systems to the extent that OARDC and Ohio are viewed as one of the top ten programs/states in this area nationally

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:1                      2013:0                      2014:0                      2015:0                      2016:0**

**3. Associated Knowledge Area(s)**

- 401 - Structures, Facilities, and General Purpose Farm Supplies
- 402 - Engineering Systems and Equipment
- 403 - Waste Disposal, Recycling, and Reuse
- 404 - Instrumentation and Control Systems
- 405 - Drainage and Irrigation Systems and Facilities

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 7**

**1. Outcome Target**

Advance the knowledge of ecological based engineered systems for waste management to the extent that, where cost effective and appropriate, they will be adopted over mechanical systems

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:1                      2013:0                      2014:0                      2015:1                      2016:0**

**3. Associated Knowledge Area(s)**

- 401 - Structures, Facilities, and General Purpose Farm Supplies
- 402 - Engineering Systems and Equipment
- 403 - Waste Disposal, Recycling, and Reuse
- 404 - Instrumentation and Control Systems
- 405 - Drainage and Irrigation Systems and Facilities

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 8**

**1. Outcome Target**

Aid rural stakeholders with onsite waste disposal systems to the extent that all rural Ohio onsite waste management systems could meet state standards

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:0                      2013:0                      2014:1                      2015:0                      2016:0**

**3. Associated Knowledge Area(s)**

- 402 - Engineering Systems and Equipment
- 403 - Waste Disposal, Recycling, and Reuse
- 404 - Instrumentation and Control Systems
- 405 - Drainage and Irrigation Systems and Facilities

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 9**

**1. Outcome Target**

Reduce through research, development, and outreach the negative impact of farm-, recreation-, or industry-related accidents within agriculture and natural resources.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:0                      2013:1                      2014:0                      2015:1                      2016:0**

**3. Associated Knowledge Area(s)**

- 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**

Climatic extremes, economic shifts such as interest rates to borrow money for facilities, public policy shifts, regulations, and shifts in demand will be impact outcomes. Human values and conflicts, e.g. urban rural issues, and environmental sensitivities to agriculture processes and location concerns related to facilities by the populace are also external factors that affect outcomes, e.g. engineering of large farms. Formative evaluation though can lessen the burden by seeking feedback throughout the life of the program. Factors such as the availability of base funding to ensure a core faculty and staff, availability of extramural funds, and programmatic demands that often exceed resources, will affect outcomes.

**V(K). Planned Program - Planned Evaluation Studies**

**Description of Planned Evaluation Studies**

{NO DATA ENTERED}



## **V(A). Planned Program (Summary)**

### **Program # 11**

#### **1. Name of the Planned Program**

Agricultural, Environmental, and Development Economics (OARDC Led)

#### **2. Brief summary about Planned Program**

The Agricultural, Environmental, and Development Economics Planned Program will continue to support OARDC and OSU Extension's full range of planned programs and in meeting the needs of our stakeholders throughout this planning period. This planned program is central to the College of Food, Agricultural, and Environmental Sciences 2008 Strategic Plan that focuses on advancing education, scholarship, knowledge acquisition, and information diffusion in three signature areas: (1) food security, production, and human health; (2) environmental quality and sustainability; and (3) advanced bioenergy and biobased products. Found within this program is research that contributes both directly and indirectly to the National Institute of Food and Agriculture's five national priority areas as well as the priorities in the new APLU/ESCOP Science Roadmap for Food and Agriculture. The faculty group leading this research defined their mission as: to generate knowledge and disseminate impartial information through application of economic and business principles to the challenges of agriculture, the food system, the environment, and economic development. This program will continue to contribute to both basic and applied understandings within our home College's four-element paradigm-production efficiency, economic viability through value added, social acceptability of our contributions, and environmental compatibility of products and practices emanating from our planned programs. Stakeholder demand for knowledge regarding production economics, management strategies, and associated business related information is high as would be expected in a state with an 90 plus billion dollar agriculture sector. Without a sound research and extension program to inform production, business management, and other financial aspects, Ohio's 90 billion dollar food and agricultural industry would be at risk. Understanding of market economics, because of both traditional market forces and the new global economy, are more critical than ever as producers, processors, and distributors factor in the multiple forces that govern the business risks they take and the decisions they make. Strong stakeholder communication has provided those conducting research and extension in this program area a sound understanding of stakeholder needs. The food and fiber industry continues to demand a robust natural resource base and a sustained flow of environmental services. Understanding the multiple economic factors that govern the wise use and sustainability of these resources and services is addressed under this program. From carbon trading to the economics of river restoration, knowledge generated in this planned program has a high demand statewide, nationally, and internationally. The new world economy has added emphasis to this program's long history of international trade and development research. Ohio has both strong export and import markets for agriculture products, thus the need to allocate resources to advance the understanding of and practices within international efforts. Generating sound applied knowledge, and providing our stakeholders the best science based information available, require that science to be rooted in strong theory and methodology. To that end this program devotes a portion of its effort to advancing theoretical understandings and improved research methodologies. Advances in areas such as experimental economics continues to support research that helps reduce risk and improve profitability. Understanding the economics and social impacts of domestic programs and policies emanating from government is necessary to aid stakeholders in their decision making and to inform those who make policy as to impact or how to create policies that will yield the desired impact. Policy research ranges from environmental policy and land use to many aspects of price and income related policy. Economic inquiry, whether focused on profitability or on maintaining environmental services and associated amenity values, has a long history of providing the science behind the agriculture scene and will continue to have impact well beyond this planning period.

**3. Program existence :** Mature (More than 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

<b>KA Code</b>	<b>Knowledge Area</b>	<b>%1862 Extension</b>	<b>%1890 Extension</b>	<b>%1862 Research</b>	<b>%1890 Research</b>
601	Economics of Agricultural Production and Farm Management	20%		10%	
602	Business Management, Finance, and Taxation	20%		10%	
603	Market Economics	15%		15%	
604	Marketing and Distribution Practices	0%		5%	
605	Natural Resource and Environmental Economics	15%		10%	
606	International Trade and Development	15%		5%	
607	Consumer Economics	0%		5%	
608	Community Resource Planning and Development	0%		5%	
609	Economic Theory and Methods	0%		20%	
610	Domestic Policy Analysis	15%		10%	
611	Foreign Policy and Programs	0%		5%	
	<b>Total</b>	100%		100%	

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

**1. Situation and priorities**

An effective and efficient food, agriculture and natural resource industry requires generation and application of economic theory, policy, and practice. Eleven million people in a relative small state, with high rates of agriculture sector activity, from production to processing to consumption, and major land use/rural - urban interface issues, yield complex social and business climates. As these are coupled with shifting market forces and new economies, the research output and associated impacts from this program are pivotal to success. How well the use of capital, human capital, and other resources are understood will greatly influence the long-term outcomes and impacts of all planned programs within this Plan of Work. Agriculture experiment stations and extension programs have a heightened obligation to understand the multiple dimensions of economics to increase both quality and quantity of products and services that are important to the citizens of Ohio. Individuals, families, and communities, as well as businesses, related agencies, etc. involved in the food and fiber industry need the research information that is generated through this program. Programs regarding how people sustain their enterprises within the rural landscape, as well as how they learn, make decisions, and organize for these enterprises, both personal and



corporate, are important from an applied perspective. Work in these knowledge areas is well - grounded theoretically with an extensive peer-reviewed literature base. The challenges lie in applying what is known to new and emerging issues and generating lines of research as needed to ensure that the citizens of Ohio's needs are met and that economies do not become an impediment to food and fiber production, as Ohio and the nation seek go provide positive direction for economic recovery. .

## **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**

Understanding economics from both basic and applied perspective of how agriculture related human enterprises function and are maintained is important. Knowledge of economics is prerequisite to maintaining the human enterprise of agriculture. As the economic problems and needs within these stakeholder communities are addressed, the organization (OARDC and OSU Extension) becomes better prepared to take advantage of emerging opportunities or to more rapidly address problems within these areas. Other key assumptions are: the economic issues within this program have been identified by our stakeholder communities, and/or via the scientific literature, and reflect the more important issues, thus warranting allocation of resources; the understanding of this planned program and how society utilizes and depends on the associated research is key to present and future decision-making in provisioning of food, fiber, and environmental services; all citizens directly benefit from this area of inquiry; these lines of inquiry will provide necessary information to inform human enterprises while protecting both the individual and corporate estate; this is an important area of study for society and will be utilized for enhanced decision-making by stakeholders and all citizens; research and education related to the multiple facets of economics are demanded by society to meet current and future needs; these economic issues are manifested at some community level and those stakeholders who are most vested will become involved; others involvement will be limited yet they will reap the benefits of a sound basic and applied understanding of this research and extension program; and federal base funding will continue to be available and leveraged to support this Planned Program and the scientific staff who carry out these lines of inquiry. Likewise it is assumed that the federal base funding will be leverage for continuing to attract state and extramural funds.

### **2. Ultimate goal(s) of this Program**

Advance knowledge regarding economic choices related to protection, management, size/scale/growth factors, and overall profitability required to support Ohio's agriculture industry and meet stakeholder demand. Grow the understanding of agribusiness management and associated systems necessary to support Ohio's agriculture industry and meet stakeholder demand. Expand knowledge base of market economics, including but not limited to domestic trade, regulation, supply and demand, and market performance and analyses. Develop and expand applicable knowledge of natural resource and environmental economics commensurate with demand from multiple stakeholders for multiple outcomes, e.g. profit, preservation, esthetics. Explore and advance theoretical and applied economics of international

trade and development as it relates to Ohio and national needs. Enhance understanding of domestic economic policy analysis in terms of government policy impact on agriculture and natural resources.

**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
2012	0.0	0.0	5.5	0.0
2013	0.0	0.0	5.5	0.0
2014	0.0	0.0	5.5	0.0
2015	0.0	0.0	5.5	0.0
2016	0.0	0.0	5.5	0.0

**V(F). Planned Program (Activity)**

**1. Activity for the Program**

Food, Agricultural and Economics Development Planned Program includes both basic and applied research. Both laboratories and multiple field sites are available throughout state to permit data gathering and to continue long - term experiments. Extensive in-state research takes place as do national and international studies. Close working relationships with multiple industries and organizations provide real - world settings and data, greatly enhancing the program's capacity and outputs/impacts. All functional laboratories and sites are improved over time as program need and resource availability warrants. OARDC faculty and staff engage in appropriate levels of outreach, engagement, and consultation, with both internal stakeholders such as fellow extension personnel, and with external stakeholders.

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

Extension	
Direct Methods	Indirect Methods
<ul style="list-style-type: none"> <li>● Education Class</li> <li>● Workshop</li> <li>● Demonstrations</li> </ul>	<ul style="list-style-type: none"> <li>● Public Service Announcement</li> <li>● Newsletters</li> </ul>

**3. Description of targeted audience**

Targeted audiences include, but are not limited to: specific individuals or groups who have expressed a need for economic findings related to some aspect of human capital that is to be derived through new research, extracted from on-going research, or is derived from scientific literature; fellow academic units that depend on scientists in this program for support information and for the approaches/measures they generate; fellow agencies or support organizations who will not only use the economic information but will also extend that information; populations who have not requested the information but will likely benefit from that information; other scientists and scientific groups; political entities; extension personnel; students from junior high school to post doctorate studies; news organizations; and business and industrial groups.

### **V(G). Planned Program (Outputs)**

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
    - Direct Adult Contacts
    - Indirect Adult Contacts
    - Direct Youth Contacts
    - Indirect Youth Contact
  - Number of patents submitted
  - Number of peer reviewed publications
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

### **V(H). State Defined Outputs**

#### **1. Output Measure**

- Report number of graduate students completed
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

**V(I). State Defined Outcome**

O. No	Outcome Name
1	New knowledge of production variations in markets that help producers, processors, and distributors have requisite information for enhanced decision making leading to decreased costs of inputs and an increase in profits/outputs.
2	Advanced knowledge of how to market and manage quality attributes of commodities leading to demonstrated value added/ profits for producers, processors, and distributors, and reported satisfaction/needs attainment among consumers.
3	Business management knowledge in targeted areas, e.g. risk management, weather insurance, impacts of land use shifts, grant management that are necessary for and result in increased profitability for stakeholders.
4	Research findings on novel programs such as pollution trading, carbon trading, conservation programs, cooperatives, etc. that results in enhanced profits, new sources of income, and/or prevention of loss of profits or loss of other resources, e.g. soil.
5	Relational contracting theory and practice information that will contribute to reduction of risks, improving profits, and adding stability to the system that meet stated stakeholder needs.
6	Stakeholders will have the necessary models that will improve on the forecasting of risk, demand, and prices in various commodity sectors leading to enhanced decision making, increased profits, and reductions in uncertainty.
7	Resultant management models that explain potential impacts of new/emerging trends e.g. trade agreements, bio-terrorism threats, and renewable fuels requirements, on specific agriculture sectors to the extent that negative impacts can be mitigated in a timely manner.
8	Market economies and efficiencies studies relating to factors such as pricing, finance, supply and demand, etc. ensuring that stakeholders are informed and their identified needs, e.g. lower operating costs, become more attainable.
9	Research finding on valuing environmental resources, e.g. wetlands, river restoration, and how it applies to stakeholder needs for demonstrated gains in profits, resources sustained, and/or actions mitigated.
10	Biocomplexity analysis to understand human-nature interactions at the landscape level that informs human enterprises, leading to demonstrated profitability, environmental protection, and/or improvements in quality of stakeholders' lives.
11	Increase profitability, reduce environmental impact, and/or improve quality of stakeholders' lives through bio-resource utilization efficiency and effectiveness research such as biomass to energy, nitrogen utilization, biocides, etc.
12	Market and non-market valuation of environmental resources, e.g. steelhead trout fishing, open space, that have often lacked economic justification that meets client needs, and informs individual, group, and government decision making.
13	Advance knowledge of vertical markets in developing counties that when applied leads to documented increased trade with the US.
14	Exchange rate, trade policy, and similar uncertainties research findings that lead to documented mitigation for stakeholders of certain negative effects of international trade.
15	New policy analysis research that informs policy development and fosters demonstrated gains for stakeholders in areas such as conservation programs, farmland protection, Farm Credit System resources, etc.

**Outcome # 1**

**1. Outcome Target**

New knowledge of production variations in markets that help producers, processors, and distributors have requisite information for enhanced decision making leading to decreased costs of inputs and an increase in profits/outputs.

**2. Outcome Type : Change in Knowledge Outcome Measure**

<b>2012:0</b>	<b>2013:1</b>	<b>2014:0</b>	<b>2015:2</b>	<b>2016:0</b>
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**3. Associated Knowledge Area(s)**

- 601 - Economics of Agricultural Production and Farm Management
- 602 - Business Management, Finance, and Taxation
- 603 - Market Economics
- 609 - Economic Theory and Methods

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 2**

**1. Outcome Target**

Advanced knowledge of how to market and manage quality attributes of commodities leading to demonstrated value added/ profits for producers, processors, and distributors, and reported satisfaction/needs attainment among consumers.

**2. Outcome Type : Change in Knowledge Outcome Measure**

<b>2012:1</b>	<b>2013:1</b>	<b>2014:0</b>	<b>2015:0</b>	<b>2016:0</b>
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**3. Associated Knowledge Area(s)**

- 601 - Economics of Agricultural Production and Farm Management
- 602 - Business Management, Finance, and Taxation
- 603 - Market Economics
- 604 - Marketing and Distribution Practices
- 606 - International Trade and Development
- 610 - Domestic Policy Analysis

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 3**

**1. Outcome Target**

Business management knowledge in targeted areas, e.g. risk management, weather insurance, impacts of land use shifts, grant management that are necessary for and result in increased profitability for stakeholders.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:1                      2013:1                      2014:0                      2015:0                      2016:0**

**3. Associated Knowledge Area(s)**

- 601 - Economics of Agricultural Production and Farm Management
- 602 - Business Management, Finance, and Taxation
- 603 - Market Economics
- 605 - Natural Resource and Environmental Economics
- 606 - International Trade and Development
- 607 - Consumer Economics
- 609 - Economic Theory and Methods
- 610 - Domestic Policy Analysis

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 4**

**1. Outcome Target**

Research findings on novel programs such as pollution trading, carbon trading, conservation programs, cooperatives, etc. that results in enhanced profits, new sources of income, and/or prevention of loss of profits or loss of other resources, e.g. soil.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:1                      2013:0                      2014:0                      2015:1                      2016:0**

**3. Associated Knowledge Area(s)**

- 601 - Economics of Agricultural Production and Farm Management
- 602 - Business Management, Finance, and Taxation
- 603 - Market Economics
- 605 - Natural Resource and Environmental Economics
- 609 - Economic Theory and Methods
- 610 - Domestic Policy Analysis
- 611 - Foreign Policy and Programs

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 5**

**1. Outcome Target**

Relational contracting theory and practice information that will contribute to reduction of risks, improving profits, and adding stability to the system that meet stated stakeholder needs.

**2. Outcome Type : Change in Knowledge Outcome Measure**

<b>2012:1</b>	<b>2013:1</b>	<b>2014:0</b>	<b>2015:0</b>	<b>2016:0</b>
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**3. Associated Knowledge Area(s)**

- 603 - Market Economics
- 606 - International Trade and Development
- 609 - Economic Theory and Methods
- 610 - Domestic Policy Analysis

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 6**

**1. Outcome Target**

Stakeholders will have the necessary models that will improve on the forecasting of risk, demand, and prices in various commodity sectors leading to enhanced decision making, increased profits, and reductions in uncertainty.

**2. Outcome Type : Change in Action Outcome Measure**

<b>2012:1</b>	<b>2013:1</b>	<b>2014:0</b>	<b>2015:0</b>	<b>2016:0</b>
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**3. Associated Knowledge Area(s)**

- 601 - Economics of Agricultural Production and Farm Management
- 602 - Business Management, Finance, and Taxation
- 603 - Market Economics
- 606 - International Trade and Development
- 609 - Economic Theory and Methods
- 610 - Domestic Policy Analysis
- 611 - Foreign Policy and Programs

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 7**

**1. Outcome Target**

Resultant management models that explain potential impacts of new/emerging trends e.g. trade agreements, bio-terrorism threats, and renewable fuels requirements, on specific agriculture sectors to the extent that negative impacts can be mitigated in a timely manner.

**2. Outcome Type : Change in Knowledge Outcome Measure**

<b>2012:0</b>	<b>2013:1</b>	<b>2014:0</b>	<b>2015:0</b>	<b>2016:0</b>
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**3. Associated Knowledge Area(s)**

- 601 - Economics of Agricultural Production and Farm Management
- 602 - Business Management, Finance, and Taxation
- 603 - Market Economics
- 604 - Marketing and Distribution Practices
- 605 - Natural Resource and Environmental Economics
- 606 - International Trade and Development
- 609 - Economic Theory and Methods
- 610 - Domestic Policy Analysis
- 611 - Foreign Policy and Programs

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 8**

**1. Outcome Target**

Market economies and efficiencies studies relating to factors such as pricing, finance, supply and demand, etc. ensuring that stakeholders are informed and their identified needs, e.g. lower operating costs, become more attainable.

**2. Outcome Type : Change in Knowledge Outcome Measure**

<b>2012:1</b>	<b>2013:0</b>	<b>2014:0</b>	<b>2015:1</b>	<b>2016:0</b>
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**3. Associated Knowledge Area(s)**

- 601 - Economics of Agricultural Production and Farm Management



- 602 - Business Management, Finance, and Taxation
- 603 - Market Economics
- 604 - Marketing and Distribution Practices
- 605 - Natural Resource and Environmental Economics
- 606 - International Trade and Development
- 607 - Consumer Economics
- 608 - Community Resource Planning and Development
- 609 - Economic Theory and Methods
- 610 - Domestic Policy Analysis
- 611 - Foreign Policy and Programs

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 9**

**1. Outcome Target**

Research finding on valuing environmental resources, e.g. wetlands, river restoration, and how it applies to stakeholder needs for demonstrated gains in profits, resources sustained, and/or actions mitigated.

**2. Outcome Type : Change in Knowledge Outcome Measure**

<b>2012:1</b>	<b>2013:1</b>	<b>2014:0</b>	<b>2015:0</b>	<b>2016:0</b>
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**3. Associated Knowledge Area(s)**

- 601 - Economics of Agricultural Production and Farm Management
- 602 - Business Management, Finance, and Taxation
- 603 - Market Economics
- 605 - Natural Resource and Environmental Economics
- 608 - Community Resource Planning and Development

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 10**

**1. Outcome Target**

Biocomplexity analysis to understand human-nature interactions at the landscape level that informs human enterprises, leading to demonstrated profitability, environmental protection, and/or improvements in quality of stakeholders' lives.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:0                      2013:1                      2014:0                      2015:0                      2016:0**

**3. Associated Knowledge Area(s)**

- 601 - Economics of Agricultural Production and Farm Management
- 602 - Business Management, Finance, and Taxation
- 603 - Market Economics
- 605 - Natural Resource and Environmental Economics
- 606 - International Trade and Development
- 608 - Community Resource Planning and Development
- 610 - Domestic Policy Analysis

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 11**

**1. Outcome Target**

Increase profitability, reduce environmental impact, and/or improve quality of stakeholders' lives through bio-resource utilization efficiency and effectiveness research such as biomass to energy, nitrogen utilization, biocides, etc.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:0                      2013:1                      2014:0                      2015:2                      2016:0**

**3. Associated Knowledge Area(s)**

- 601 - Economics of Agricultural Production and Farm Management
- 602 - Business Management, Finance, and Taxation
- 603 - Market Economics
- 605 - Natural Resource and Environmental Economics
- 607 - Consumer Economics
- 608 - Community Resource Planning and Development
- 610 - Domestic Policy Analysis

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 12**

**1. Outcome Target**

Market and non-market valuation of environmental resources, e.g. steelhead trout fishing, open space, that have often lacked economic justification that meets client needs, and informs individual, group, and government decision making.

**2. Outcome Type : Change in Action Outcome Measure**

**2012:1                      2013:0                      2014:0                      2015:1                      2016:0**

**3. Associated Knowledge Area(s)**

- 601 - Economics of Agricultural Production and Farm Management
- 602 - Business Management, Finance, and Taxation
- 603 - Market Economics
- 605 - Natural Resource and Environmental Economics
- 606 - International Trade and Development
- 607 - Consumer Economics
- 609 - Economic Theory and Methods
- 610 - Domestic Policy Analysis

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 13**

**1. Outcome Target**

Advance knowledge of vertical markets in developing counties that when applied leads to documented increased trade with the US.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:0                      2013:0                      2014:0                      2015:1                      2016:0**

**3. Associated Knowledge Area(s)**

- 602 - Business Management, Finance, and Taxation
- 603 - Market Economics
- 606 - International Trade and Development
- 609 - Economic Theory and Methods
- 610 - Domestic Policy Analysis

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 14**

**1. Outcome Target**

Exchange rate, trade policy, and similar uncertainties research findings that lead to documented mitigation for stakeholders of certain negative effects of international trade.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:0                      2013:1                      2014:0                      2015:0                      2016:0**

**3. Associated Knowledge Area(s)**

- 601 - Economics of Agricultural Production and Farm Management
- 602 - Business Management, Finance, and Taxation
- 603 - Market Economics
- 606 - International Trade and Development
- 607 - Consumer Economics
- 608 - Community Resource Planning and Development
- 609 - Economic Theory and Methods
- 610 - Domestic Policy Analysis

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 15**

**1. Outcome Target**

New policy analysis research that informs policy development and fosters demonstrated gains for stakeholders in areas such as conservation programs, farmland protection, Farm Credit System resources, etc.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:1                      2013:1                      2014:0                      2015:0                      2016:0**

**3. Associated Knowledge Area(s)**

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

- 604 - Marketing and Distribution Practices
- 605 - Natural Resource and Environmental Economics
- 608 - Community Resource Planning and Development
- 609 - Economic Theory and Methods
- 610 - Domestic Policy Analysis

**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**

Shifts in economy impact all aspects of peoples lives, psychologically, socially, business wise, and physically. Within this program area public monies, and the fluctuations in appropriations of such, that can have dramatic (both positive and negative) affect on human well being, as do levels of government regulations. Likewise public policy, priorities, and perceptions, including popular culture and trends/fads, are major external factors impacting this program. Priority of economics research for limited dollars, and the resulting competition, impact the extent that research can be carried out. Other factors such as economic conditions and needs of migrant populations entering the community and workforce, or new populations who have recently immigrated into the area and are ill prepared to sustain themselves socially and monetarily, are impacts. To an extent though, it is these various external factors that are studied in relationship to economic theory that yields the valued research generated by the scientists in this program. Weather related factors impact the conditions and attributes that are being studied by creating uncertainty that cannot be controlled for. Factors such as the availability of base funding to ensure a core faculty and staff, availability of extramural funds, and programmatic demands that often exceed resources, will affect outcomes.

**V(K). Planned Program - Planned Evaluation Studies**

**Description of Planned Evaluation Studies**

{NO DATA ENTERED}



## **V(A). Planned Program (Summary)**

### **Program # 12**

#### **1. Name of the Planned Program**

Human Health (OARDC Led)

#### **2. Brief summary about Planned Program**

Human health as it relates to food and environment is a major concern from both society's perspective and from an agricultural experiment station research perspective, as well as from an extension programmatic perspective. Agricultural crops (both plant and animal), their residues, renewable natural resources, and the related manufacturing processes and food products, all have human health and safety risks associated with them. This Planned Program is central to the College of Food, Agricultural, and Environmental Sciences 2008 Strategic Plan. That plan focuses on advancing education, scholarship, knowledge acquisition, and information diffusion in three signature areas : (1) food security, production, and human health; (2) environmental quality and sustainability; and (3) advanced bioenergy and biobased products. This Planned Program will continue to be focused, through aggressive research and extension programming, on reducing threats to human health and improving societal well-being within OARDC's sphere of influence. One faculty group working in OARDC's food and animal health program wrote: emerging pathogens, zoonoses, and microbial contamination of food and the environment threaten agricultural productivity, sustainability, and public health worldwide. Our mission is to protect and enhance animal and public health through research, education and outreach; and to support the animal industries in economically producing safe, wholesome food in an environmentally and socially responsible manner. Emerging and re-emerging zoonotic diseases, for example, are considered an important threat to public health. One group of scientist, in conjunction with a number of other colleges studies the diagnosis, epidemiology, pathogenesis, and control of zoonotic diseases in the animal reservoir and the environment. Development of new sensitive tests for astroviruses facilitates the diagnosis of the disease, epidemiology of the infection and a variety of other studies. Studies are also being initiated on emerging animal and plant diseases such as avian influenza viruses, soybean rust, and sudden oak death. While these are emerging diseases that threaten American agriculture, they may also harbor a possible threat to public health. Many Ohioans suffer and sometimes die in response to allergens produced by arthropods, such as dust mites. Asthma and allergy patients need solutions other than drugs. The goal is to develop and test economically efficient, socially acceptable, and environmentally benign strategies for controlling allergen producers. Some 10.3% of adults in Ohio have asthma, which is greater than any other chronic disease. The percentage of children suffering from asthma approaches 15% in some areas with minority and lower income families suffering the most. In the US, about 5,000 people die from asthma annually. In 2001, \$760,000,000 was spent to treat asthma (hospitalizations) patients in Ohio and the costs continue to rise at an alarming rate. Because asthma is a chronic disease it is one of the most expensive to manage. Thus, health care organizations are eager for novel developments in reducing or preventing asthma. Our research offers a solution in integrated pest management of allergen producers as more than half of the asthma sufferers are sensitive to indoor allergens, especially dust mites. This Planned Program will address needs that are central to OARDC, OSU Extension, NIFA, and APLU/ESCOP health - related goals throughout 2012 -2016.

**3. Program existence :** Intermediate (One to 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
703	Nutrition Education and Behavior	0%		5%	
721	Insects and Other Pests Affecting Humans	25%		15%	
722	Zoonotic Diseases and Parasites Affecting Humans	50%		45%	
723	Hazards to Human Health and Safety	25%		20%	
724	Healthy Lifestyle	0%		15%	
	<b>Total</b>	100%		100%	

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

## 1. Situation and priorities

Providing for human health within our related industries and among producers, processors, distributors, and consumers, studying overall societal wellbeing within OARDC's sphere of influence, including obesity research (to be reported under a different Planned Program), and using the best science and extension methods available are expectations of OARDC's stakeholders. The science behind advancing human health, including healthy lifestyles, has both personal consequences as well as importance to insuring a safe, stable society and protecting the economy from unnecessary losses. OARDC and OSU Extension address direct needs of their constituency groups by regularly interacting with them and understanding their needs. These programs directly support OARDC's broader goals of production efficiency, economic viability, environmental stewardship, and social acceptability by better protecting the workforce who produces, and the consumers who buy the technologies and products from the agriculture and natural resource sectors. Without a growing body of knowledge to help protect society, opportunities will be missed for social and economic security, and society will not be well served. OARDC and OSU Extension are well positioned to continue to affect positive change in this planned program. To meet growing demand of better human health, scientists must continue to make advances in techniques and processes that are associated with the food systems. Due to the complexity of the problems, research and extension programs are integrated in multiple academic departments across multiple colleges at Ohio State University.

## 2. Scope of the Program

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

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

## 1. Assumptions made for the Program

A client oriented research, development, and outreach program in the human health and well being is critical to meeting society's overt and latent needs in this area. As we address problems and needs within



our stakeholder communities through 2016, the organization (OARDC and OSU Extension) will become better prepared to take advantage of emerging opportunities or to more rapidly address these problems. Other key assumptions are: The issues within this program have been identified by our stakeholder communities, and/or via the scientific literature, reflect the more important issues, and warrant allocation of resources; The understanding of this planned program and how society utilizes and depends on the safety research is key to present and future decision-making in provisioning for society domestically and worldwide; All citizens directly benefit from advanced human health research and extension programs; These lines of inquiry are necessary to inform human enterprises. Such research and education efforts are demanded by society to meet current and future needs.

**2. Ultimate goal(s) of this Program**

Human health research will advance the study of insects, ticks, and mites to protect human health, including methods of control. Human health research will seek to better understand the means and methods related to transmission of zoonotic diseases to humans, including prevention; and grow fundamental and applied knowledge as to animal reservoirs for zoonotics. Likewise this planned program will seek to expand knowledge of and application to human health issues that are within the sphere of agricultural, food, and environmental research science that are not related to zoonotics per se. The factors may be the result of production and processing, ingestion, or similar of foods, byproducts, or wastestreams from agriculture.

**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
2012	0.0	0.0	1.0	0.0
2013	0.0	0.0	1.0	0.0
2014	0.0	0.0	1.0	0.0
2015	0.0	0.0	1.0	0.0
2016	0.0	0.0	1.0	0.0

**V(F). Planned Program (Activity)**

**1. Activity for the Program**

On -going research activities to advance human health goals for societal well being include both basic and applied research. Effective research requires a mixture of laboratory and gathering places for subjects to maximize research knowledge. Emerging threats now require more advanced facilities such as a biosecurity lab, particularly needed in the study infectious animal diseases that may directly impact humans. All functional laboratories and sites are improved over time as program need warrants. OARDC faculty and staff will engage in appropriate levels of outreach, engagement, and consultation with both internal stakeholders such as fellow extension personnel, and with external stakeholders.

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

**Extension**

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> <li>● Education Class</li> <li>● Workshop</li> <li>● Demonstrations</li> </ul>	<ul style="list-style-type: none"> <li>● Public Service Announcement</li> <li>● Newsletters</li> </ul>

**3. Description of targeted audience**

Targeted audiences include, but are not limited to: specific individuals or groups who have expressed a need for health, obesity, and safety information that is to be derived through new research, extracted from on-going research, or is derived from scientific literature; fellow academic units that depend on scientists in this program for support information and for new health and safety technologies and approaches/measures fellow agencies or support organizations who will not only use the information but will also extend that information; populations who have not requested the information but will likely benefit from that information; other scientists and scientific groups; political entities; extension personnel; students from pre-school to post doctorate studies; news organizations; and business and industrial groups.

**V(G). Planned Program (Outputs)**

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
  - Direct Adult Contacts
  - Indirect Adult Contacts
  - Direct Youth Contacts
  - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

**V(H). State Defined Outputs**

**1. Output Measure**

- Number of graduate students completed

- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

**V(I). State Defined Outcome**

O. No	Outcome Name
1	Release studies on insects, ticks, and mites to protect human health that will provide a set of alternatives leading to health gains with lowered risks, and within economic realities, for the affected populations.
2	Advance the understanding of means and methods related to transmission of zoonotic diseases to humans, including prevention, that meets consumer demand/health threat, as or before such emerges.
3	Reduce through research, development, and outreach the exposure to biohazards, pathogens, and similar to the extent that annually such are reduced per capita with an overall time and economic savings to those who may be affected.
4	Reduce health risk by releasing at least one major study each five years demonstrating techniques, procedures, or products that lessen the chance of contacting, or the impact if contacted, zoonotic diseases.
5	Create a growing base of knowledge that supports improving human health as it relates to food, environment, and lifestyle

**Outcome # 1**

**1. Outcome Target**

Release studies on insects, ticks, and mites to protect human health that will provide a set of alternatives leading to health gains with lowered risks, and within economic realities, for the affected populations.

**2. Outcome Type : Change in Knowledge Outcome Measure**

<b>2012:1</b>	<b>2013:1</b>	<b>2014:0</b>	<b>2015:0</b>	<b>2016:0</b>
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**3. Associated Knowledge Area(s)**

- 721 - Insects and Other Pests Affecting Humans
- 722 - Zoonotic Diseases and Parasites Affecting Humans

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 2**

**1. Outcome Target**

Advance the understanding of means and methods related to transmission of zoonotic diseases to humans, including prevention, that meets consumer demand/health threat, as or before such emerges.

**2. Outcome Type : Change in Knowledge Outcome Measure**

<b>2012:1</b>	<b>2013:0</b>	<b>2014:0</b>	<b>2015:0</b>	<b>2016:0</b>
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**3. Associated Knowledge Area(s)**

- 721 - Insects and Other Pests Affecting Humans
- 722 - Zoonotic Diseases and Parasites Affecting Humans

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 3**

**1. Outcome Target**

Reduce through research, development, and outreach the exposure to biohazards, pathogens, and similar to the extent that annually such are reduced per capita with an overall time and economic savings to those who may be affected.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:2                      2013:0                      2014:0                      2015:1                      2016:0**

**3. Associated Knowledge Area(s)**

- 723 - Hazards to Human Health and Safety
- 724 - Healthy Lifestyle

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 4**

**1. Outcome Target**

Reduce health risk by releasing at least one major study each five years demonstrating techniques, procedures, or products that lessen the chance of contacting, or the impact if contacted, zoonotic diseases.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:0                      2013:0                      2014:0                      2015:1                      2016:0**

**3. Associated Knowledge Area(s)**

- 721 - Insects and Other Pests Affecting Humans
- 722 - Zoonotic Diseases and Parasites Affecting Humans

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 5**

**1. Outcome Target**

Create a growing base of knowledge that supports improving human health as it relates to food, environment, and lifestyle

**2. Outcome Type : Change in Action Outcome Measure**

**2012:1                      2013:1                      2014:0                      2015:0                      2016:0**

**3. Associated Knowledge Area(s)**

- 721 - Insects and Other Pests Affecting Humans
- 722 - Zoonotic Diseases and Parasites Affecting Humans

- 723 - Hazards to Human Health and Safety
- 724 - Healthy Lifestyle

#### **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**

Certain weather conditions play a major role in encouraging the growth and spread of pests and diseases that can be transmitted to humans. Shifts in economy can impact manufacturers abilities to attend to or government responsiveness to human health. Access to health care and education regarding healthy lifestyles also affects outcomes. Within this program area public monies, and the fluctuations in appropriations of such, have dramatic effect on human health, as do levels of regulations. Likewise public policy and the publics priorities and perceptions, especially regarding risks, are major external factors impacting this program. Priority of this research for limited dollars and the resulting competition impact the extent of research that can be carried out. Other factor is migrant populations entering the workforce without fully understanding the risks. New populations who have recently immigrated into the area, often do not understand risk and are subject to disease because of uninformed choices. Items such as potential levels of public exposure to certain zoonotic diseases are major external factors. Likewise public willingness to learn safety procedures in terms of pests or zoonotic disease threats are factors that are beyond the researchers control. Often times formative evaluation though can lessen the impact of externalities by seeking feedback throughout the life of the program. Factors such as the availability of base funding to ensure a core faculty and staff, availability of extramural funds, and programmatic demands that often exceed resources, will affect outcomes.

### **V(K). Planned Program - Planned Evaluation Studies**

#### **Description of Planned Evaluation Studies**

{NO DATA ENTERED}

## **V(A). Planned Program (Summary)**

### **Program # 13**

#### **1. Name of the Planned Program**

Human and Community Resource Development (OARDC Led)

#### **2. Brief summary about Planned Program**

Food, agriculture, and natural resources industries in Ohio, annually contributing 100 plus billion dollars to the state economy, will continue to be dependent on investments in human capital. To that end a Human and Community Resource Development (HCRD) Planned Program, that includes faculty from multiple departments and two colleges, will continue to collectively guide outcome/impact-based research and associated extension efforts. This program is central to the College of Food, Agricultural, and Environmental Sciences 2008 Strategic Plan that focuses on advancing education, scholarship, knowledge acquisition, and information diffusion in three signature areas: (1) food security, production, and human health; (2) environmental quality and sustainability; and (3) advanced bioenergy and biobased products. Programs that advance the understanding of how rural individuals and communities utilize their resources to effectively participate in the agriculture economy is central to understanding the phenomena of human capital. First individuals and families are studied to better grasp how family structures function and what is required for their well-being. Rapid changes in sociological parameters and in technologies influence how individuals, families, and communities organize and behave in order to maintain functionality within the rural economy. Within this program are also foci directed towards program design, administration/management, and the analytical tools needed for evaluation and assessment. All of these aforementioned areas will remain in the portfolios related to this planned program. Now, more than ever, outcome-based planned programs need the tools and techniques within this program to aid in more rapidly moving programs, technologies, and products into society. A well-educated society is often the key to adoption of these new programs, technologies, and products. To that end agricultural and environmental communication and education are program foci. While this planned program contributes to the broader College of Food, Agricultural, and Environmental Sciences' goals of production efficiency, economic viability, and environmental compatibility, it provides major research and extension leadership in understanding and extending the concept of social acceptability of agricultural industry practices. Its importance will continue throughout this planning period (2012 -2016) and very well may be enhanced by organization changes that have added some OSU Extension faculty members to the team working primarily in this Planned Program.

**3. Program existence :** Mature (More than 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

<b>KA Code</b>	<b>Knowledge Area</b>	<b>%1862 Extension</b>	<b>%1890 Extension</b>	<b>%1862 Research</b>	<b>%1890 Research</b>
801	Individual and Family Resource Management	0%		10%	
802	Human Development and Family Well-Being	15%		15%	
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	40%		20%	
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures	0%		5%	
805	Community Institutions, Health, and Social Services	0%		5%	
901	Program and Project Design, and Statistics	10%		10%	
902	Administration of Projects and Programs	15%		15%	
903	Communication, Education, and Information Delivery	20%		20%	
	<b>Total</b>	100%		100%	

**V(C). Planned Program (Situation and Scope)****1. Situation and priorities**

To maintain and effective food, agriculture, and natural resource program throughout the state requires investment in the human side of the agricultural equation, especially as we seek to grow the economy and improve job opportunities. With 11 million people in a relative small state, the demand for consumptive and non-consumptive uses of the resources continues to grow. How human capital and their programs are investigated in will greatly influence the long-term outcomes of all planned programs. Agriculture experiment stations and extension programs, especially in a state such as Ohio, have a heightened obligation to understand the societal component to meet the multiple outcomes desired by individuals, families, and communities as well as businesses and related agencies. The food and fiber industry need the research information that is generated through this program. Programs regarding how people live, work, and function, as well as how they learn, make decisions, and organize for personal and human enterprises are important. Work in these knowledge areas is well-grounded theoretically, and extensive applied peer-reviewed literature exists. The challenges lie in applying what is known to new and emerging issues and generating lines of research as needed to ensure that the citizens of Ohio's needs are met and that human issues do not become an impediment to food and fiber production.

**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**

A key assumption is that by understanding the social underpinnings (both basic and applied) of how individuals and communities are maintained is an important component of agriculture. Knowledge of stakeholder populations, their built environment, how they organize themselves, and the influence of sociological and technological changes are prerequisite to maintaining the human enterprise of agriculture. Multiple issues related to the human condition, both rural and urban, as well as issues related to rural-urban interface, human ecology, and social responsibility within food, agricultural, and environmental enterprises, are areas in need of research inquiry and extension education. As the problems and needs within these stakeholder communities are addressed, the organization (OARDC and OSU Extension) becomes better prepared to take advantage of emerging opportunities or to more rapidly address problems within these areas. Other key assumptions are: The issues within this program have been identified by our stakeholder communities, and/or via the scientific literature, reflect the more important issues and warrant allocation of resources; The understanding of this planned program and how society utilizes and depends on the associated research is key to present and future decision-making in provisioning of food, fiber, and environmental services; To a greater or lesser extent all citizens at some point in their life directly benefit from this area of inquiry; These lines of inquiry will provide necessary information to inform human enterprises while protecting individuals, families and communities. This is an important area of study for society and will be utilized for enhanced decision-making by stakeholders and all citizens; Research and education related to human capital is a demand by society to meet current and future needs. These issues are manifested at some community level and those stakeholders who are most vested will become involved; others involvement will be limited yet they will reap the benefits of a sound basic and applied understanding of these research and extension programs; and base federal funding will continue to be available and leveraged to support this planned program and the scientific staff who carry out the lines of inquiry noted within the knowledge areas for this program. Likewise it is assumed that the federal base funding will be leverage for continuing to attract state and extramural funds.

### **2. Ultimate goal(s) of this Program**

Human and community resource development research will: advance the understanding of human development and family/societal well-being to better understand the role of human capital in agriculture and natural resources, in both the rural and urban setting as well as the ecology of human enterprises; expand knowledge of how rural populations, their organizations, their built and social environments, and associated technologies, including changes, effect individuals, families, groups and communities in terms of functionality within the business of agriculture/natural resources; improve upon program and project design in order to effect outcomes; study project formulation and administration in order to better understand and promote creativity, productivity, partnerships, collaboration, and proficiency within our own programs; and provide applied insights into multiple dimensions of communication, education and information services to advance the teaching and learning process within agriculture and natural resources. These goals are effective throughout 2016.

## **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
2012	0.0	0.0	2.5	0.0
2013	0.0	0.0	2.5	0.0
2014	0.0	0.0	2.5	0.0
2015	0.0	0.0	2.5	0.0
2016	0.0	0.0	2.5	0.0

**V(F). Planned Program (Activity)**

**1. Activity for the Program**

The activities carried out in this Human and Community Resource Development Planned Program is primarily applied research. Both laboratories and multiple field sites/community settings are available throughout state to permit data gathering and to continue projects requiring data over time. All functional laboratories and sites are improved over time as program need warrants. OARDC faculty and staff engage in appropriate levels of outreach, engagement, and consultation, with both internal stakeholders such as fellow extension personnel, and with external stakeholders.

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

**Extension**

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> <li>● Education Class</li> <li>● Workshop</li> <li>● Demonstrations</li> </ul>	<ul style="list-style-type: none"> <li>● Public Service Announcement</li> <li>● Newsletters</li> </ul>

**3. Description of targeted audience**

Targeted audiences include, but not limited to: specific individuals or groups who have expressed a need for information related to some aspect of human capital that is to be derived through new research, extracted from on-going research, or is derived from scientific literature; fellow academic units that depend on scientists in this program for support information and for approaches/measures; fellow agencies or support organizations who will not only use the social information but will also extend that information; populations who have not requested the information but will likely benefit from that information; other scientists and scientific groups; political entities; extension personnel; students from pre-school to post doctorate studies; news organizations; and business and industrial groups.

### **V(G). Planned Program (Outputs)**

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
    - Direct Adult Contacts
    - Indirect Adult Contacts
    - Direct Youth Contacts
    - Indirect Youth Contact
  - Number of patents submitted
  - Number of peer reviewed publications
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

### **V(H). State Defined Outputs**

#### **1. Output Measure**

- Number of graduate students completed.
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

**V(I). State Defined Outcome**

O. No	Outcome Name
1	Advance human capital and sociological studies that will inform strategies for expanding and strengthening the agricultural workforce leading to improved quality and quantity of jobs in rural areas yielding demonstrated economic growth.
2	Advance human capital and sociological studies that will inform strategies for strengthening individual and family well-being, and community stability, e.g. grandmother daycare in single head households.
3	Develop a more complete understanding of the relationship between learning style and cognitive abilities of Ohio agricultural students to inform teaching ?learning leading to gain score increases within and a better-educated workforce.
4	Conduct statewide survey research to better understand public attitudes, perceptions, opinions, and behaviors related to select topics in agriculture, annually documenting how those data impact decision-making, e.g. public policy, industrial decisions.
5	Investigate shifts in rural-urban interface, land use, immigration, and similar changes to determine if community policies and/or levels of social capital in the community can shape the future of agriculture in face of urbanization pressures.
6	Improve through research the understanding of and skill development for decision-making by local farmers that will result in improved farm viability and competitiveness at the rural-urban interface.
7	Develop a conceptual framework within five years that will inform programming for developing statewide leadership characteristics, skills, and attitudes in a core of present and future leaders in order to advance a more socially responsible industry.
8	Study rural educational systems relative to educational resources, curriculum, instructional delivery, and student learning to the extent necessary to inform decision-makers how to improve rural education systems as requested.
9	Investigate the social implications of structural changes in agriculture and their economic implications, documenting challenges and opportunities for rural individuals, families, groups and communities, including business and government.
10	Investigate project formulation and administration to the extent that the findings help the institution to document gains in creativity, productivity, partnerships, collaboration, and proficiency within five years.
11	Advance understanding of communication, education and information services to show gain scores in the teaching and learning process within related agriculture and natural resources programs.

**Outcome # 1**

**1. Outcome Target**

Advance human capital and sociological studies that will inform strategies for expanding and strengthening the agricultural workforce leading to improved quality and quantity of jobs in rural areas yielding demonstrated economic growth.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:0                      2013:1                      2014:0                      2015:0                      2016:0**

**3. Associated Knowledge Area(s)**

- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures
- 805 - Community Institutions, Health, and Social Services
- 901 - Program and Project Design, and Statistics

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 2**

**1. Outcome Target**

Advance human capital and sociological studies that will inform strategies for strengthening individual and family well-being, and community stability, e.g. grandmother daycare in single head households.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:0                      2013:1                      2014:0                      2015:0                      2016:0**

**3. Associated Knowledge Area(s)**

- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 805 - Community Institutions, Health, and Social Services

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 3**

**1. Outcome Target**

Develop a more complete understanding of the relationship between learning style and cognitive abilities of Ohio agricultural students to inform teaching ?learning leading to gain score increases within and a better-educated workforce.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:0                      2013:1                      2014:0                      2015:1                      2016:0**

**3. Associated Knowledge Area(s)**

- 901 - Program and Project Design, and Statistics
- 902 - Administration of Projects and Programs
- 903 - Communication, Education, and Information Delivery

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 4**

**1. Outcome Target**

Conduct statewide survey research to better understand public attitudes, perceptions, opinions, and behaviors related to select topics in agriculture, annually documenting how those data impact decision-making, e.g. public policy, industrial decisions.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:0                      2013:1                      2014:0                      2015:1                      2016:0**

**3. Associated Knowledge Area(s)**

- 901 - Program and Project Design, and Statistics
- 903 - Communication, Education, and Information Delivery

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 5**

**1. Outcome Target**

Investigate shifts in rural-urban interface, land use, immigration, and similar changes to determine if community policies and/or levels of social capital in the community can shape the future of agriculture in face of urbanization pressures.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:1                      2013:1                      2014:0                      2015:0                      2016:0**

**3. Associated Knowledge Area(s)**

- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 805 - Community Institutions, Health, and Social Services
- 901 - Program and Project Design, and Statistics

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 6**

**1. Outcome Target**

Improve through research the understanding of and skill development for decision-making by local farmers that will result in improved farm viability and competitiveness at the rural-urban interface.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:0                      2013:1                      2014:0                      2015:0                      2016:0**

**3. Associated Knowledge Area(s)**

- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 805 - Community Institutions, Health, and Social Services
- 901 - Program and Project Design, and Statistics
- 903 - Communication, Education, and Information Delivery

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 7**

**1. Outcome Target**

Develop a conceptual framework within five years that will inform programming for developing statewide leadership characteristics, skills, and attitudes in a core of present and future leaders in order to advance a more socially responsible industry.



**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:1                      2013:0                      2014:0                      2015:1                      2016:0**

**3. Associated Knowledge Area(s)**

- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 805 - Community Institutions, Health, and Social Services
- 901 - Program and Project Design, and Statistics
- 902 - Administration of Projects and Programs
- 903 - Communication, Education, and Information Delivery

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 8**

**1. Outcome Target**

Study rural educational systems relative to educational resources, curriculum, instructional delivery, and student learning to the extent necessary to inform decision-makers how to improve rural education systems as requested.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:1                      2013:0                      2014:0                      2015:1                      2016:0**

**3. Associated Knowledge Area(s)**

- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 805 - Community Institutions, Health, and Social Services
- 901 - Program and Project Design, and Statistics
- 903 - Communication, Education, and Information Delivery

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 9**

**1. Outcome Target**

Investigate the social implications of structural changes in agriculture and their economic implications, documenting challenges and opportunities for rural individuals, families, groups and communities,

including business and government.

**2. Outcome Type** : Change in Knowledge Outcome Measure

**2012:1**                      **2013:0**                      **2014:0**                      **2015:0**                      **2016:0**

**3. Associated Knowledge Area(s)**

- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 901 - Program and Project Design, and Statistics
- 903 - Communication, Education, and Information Delivery

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 10**

**1. Outcome Target**

Investigate project formulation and administration to the extent that the findings help the institution to document gains in creativity, productivity, partnerships, collaboration, and proficiency within five years.

**2. Outcome Type** : Change in Knowledge Outcome Measure

**2012:1**                      **2013:0**                      **2014:2**                      **2015:0**                      **2016:0**

**3. Associated Knowledge Area(s)**

- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and Communities
- 901 - Program and Project Design, and Statistics
- 902 - Administration of Projects and Programs

**4. Associated Institute Type(s)**

- 1862 Research

**Outcome # 11**

**1. Outcome Target**

Advance understanding of communication, education and information services to show gain scores in the teaching and learning process within related agriculture and natural resources programs.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:1                      2013:0                      2014:0                      2015:1                      2016:0**

**3. Associated Knowledge Area(s)**

- 901 - Program and Project Design, and Statistics
- 903 - Communication, Education, and Information Delivery

**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.)
- Other (Trends and fads)

**Description**

Weather can play a major role in creating adverse working and living conditions thus impacting people who are the focus of this Planned Program. Shifts in economy impact all aspects of peoples lives, psychologically, socially, and physically. Within this program area public monies, and the fluctuations in appropriations of such, have dramatic (both positive and negative) affects on human well-being, as do levels of government regulations. Likewise public policy and the publics priorities and perceptions, including popular culture and trends/fads, are major external factors impacting this program. Priority of social science research for limited dollars, and the resulting competition, impact the extent that research can be carried out. Other factors such as migrant populations entering the community and workforce, or new populations who have recently immigrated into the area, and are ill-prepared to sustain themselves socially and monetarily. Learning styles, disabilities, background, education, and similar affect how one learns and how they will use any new knowledge gained. Often, individuals traits are well inculcated into that individuals psyche and behavior change is slow. Factors such as the availability of base funding to ensure a core faculty and staff, availability of extramural funds, and programmatic demands that often exceed resources, all will affect outcomes.

**V(K). Planned Program - Planned Evaluation Studies**

**Description of Planned Evaluation Studies**

{NO DATA ENTERED}

**V(A). Planned Program (Summary)**

**Program # 14**

**1. Name of the Planned Program**

Business Retention and Expansion Initiative (Extension)

**2. Brief summary about Planned Program**

The Ohio BR&E program has aimed to strengthen the capacity of local leaders and residents to affect economic conditions in more than 140 communities since 1986. With the Internet, many of the program's resources are now available to participating communities via the web, providing a great deal of flexibility to the participants in how the program is delivered. Ultimately, the program aims to engage community stakeholders in a formal dialogue in order to empower local development officials and community at large to act on economic development issues of strategic importance.

**3. Program existence :** Mature (More than 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
608	Community Resource Planning and Development	100%		0%	
	<b>Total</b>	100%		0%	

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

**1. Situation and priorities**

Local communities lack an understanding of community issues related to economic development. Local officials lack knowledge of existing business needs and resulting expansion strategies. Relations among community stakeholders (businesses, residents, local leaders/officials) are fragmented. This program aims to address all three concerns, and does so relying on over 20 years of practical application in the field.

**2. Scope of the Program**

- In-State Extension
- Multistate Extension

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

**1. Assumptions made for the Program**

For the program to succeed, it is assumed that community stakeholders are desirous of cultivating relationships and local officials and community decision-makers value research-based information. The format has been tried and tested since 1986, evolving over time to best meet community stakeholders' needs.

**2. Ultimate goal(s) of this Program**

The program goal: Community leaders, residents, and businesses will engage in ongoing, meaningful dialogue that will lead to the retention of existing jobs, creation of new jobs, and ultimately creation of new businesses.

**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
2012	4.0	0.0	0.0	0.0
2013	3.0	0.0	0.0	0.0
2014	3.0	0.0	0.0	0.0
2015	2.0	0.0	0.0	0.0
2016	2.0	0.0	0.0	0.0

**V(F). Planned Program (Activity)**

**1. Activity for the Program**

BR&E Program Outputs include: BR&E training, on-site workshops and one-on-one consultation, volunteer organizational efforts, continuous update of BR&E hard copy and web-based materials such as questionnaires, reports, and presentations in cooperation with development officials, elected officials, businesses, and community stakeholders including Extension professionals.

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

Extension	
Direct Methods	Indirect Methods
<ul style="list-style-type: none"> <li>● Workshop</li> <li>● Group Discussion</li> <li>● One-on-One Intervention</li> <li>● Demonstrations</li> </ul>	<ul style="list-style-type: none"> <li>● Web sites other than eXtension</li> <li>● Other 1 (Podcasts)</li> </ul>

**3. Description of targeted audience**

Local development officials, community volunteers, Extension professionals (direct); community stakeholders (indirect)

## **V(G). Planned Program (Outputs)**

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
    - Direct Adult Contacts
    - Indirect Adult Contacts
    - Direct Youth Contacts
    - Indirect Youth Contact
  - Number of patents submitted
  - Number of peer reviewed publications
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

## **V(H). State Defined Outputs**

### **1. Output Measure**

- Formal training workshops
  - one-on-one consultations
  - formal community presentation of findings
  - web-based questionnaires
  - hard-copy questionnaires
  - Number of program planning and implementation volunteers
  - Number of program planning and implementation volunteer hours donated
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

**V(I). State Defined Outcome**

O. No	Outcome Name
1	Local leaders and community residents will be more familiar with different ways of analyzing data and more capable of interpreting data needed to make important community decisions.
2	Local leaders and community residents will use BR&E data and other secondary data available to make better-informed community decisions.
3	Jobs will be created and retained as a result of ongoing, meaningful dialogue among community leaders, residents, and businesses.



**Outcome # 1**

**1. Outcome Target**

Local leaders and community residents will be more familiar with different ways of analyzing data and more capable of interpreting data needed to make important community decisions.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:300                      2013:250                      2014:200                      2015:200                      2016:200**

**3. Associated Knowledge Area(s)**

- 608 - Community Resource Planning and Development

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 2**

**1. Outcome Target**

Local leaders and community residents will use BR&E data and other secondary data available to make better-informed community decisions.

**2. Outcome Type : Change in Action Outcome Measure**

**2012:300                      2013:250                      2014:200                      2015:200                      2016:200**

**3. Associated Knowledge Area(s)**

- 608 - Community Resource Planning and Development

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 3**

**1. Outcome Target**

Jobs will be created and retained as a result of ongoing, meaningful dialogue among community leaders, residents, and businesses.

**2. Outcome Type : Change in Condition Outcome Measure**

**2012:1200**

**2013:1200**

**2014:1200**

**2015:1200**

**2016:1200**

**3. Associated Knowledge Area(s)**

- 608 - Community Resource Planning and Development

**4. Associated Institute Type(s)**

- 1862 Extension

**V(J). Planned Program (External Factors)**

**1. External Factors which may affect Outcomes**

- Economy
- Appropriations changes
- Public Policy changes
- Competing Public priorities
- Competing Programmatic Challenges

**Description**

Economic growth period may enable business growth despite assistance resulting from ongoing, meaningful dialogue among community leaders, residents, and businesses.

**V(K). Planned Program - Planned Evaluation Studies**

**Description of Planned Evaluation Studies**

Ongoing (annually) web-based program evaluation tools are used to track key program indicators and inform program modification efforts. Retrospective pretest-post test evaluation tools are used at the conclusion of program workshops and training sessions throughout the year to document change in knowledge, awareness, and anticipated behavior. Informal program evaluation and impact documentation feedback is also collected via conversations with program participants.

**V(A). Planned Program (Summary)**

**Program # 15**

**1. Name of the Planned Program**

Dining with Diabetes (Extension)

**2. Brief summary about Planned Program**

Healthy People are a major focus of OSUE Family and Consumer Sciences programming. Ten leading health indicators have been selected in "Healthy People 2010" a partnership between public, private and non-profit sectors to address chronic health issues facing Americans. They include physical activity, overweight and obesity.

Dining with Diabetes is a nutrition education program designed to help individuals with diabetes better manage their disease. Through this program Ohioans with this chronic condition will better manage their disease, reduce health costs and complications. In the long run helping them to reduce the risks of heart disease, cancer and obesity through improved diet and increased physical activity.

**3. Program existence :** Intermediate (One to 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
703	Nutrition Education and Behavior	100%		100%	
	<b>Total</b>	100%		100%	

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

**1. Situation and priorities**

Obesity, heart disease, cancer and diabetes are becoming more prevalent in Ohio. According to Nancy Schaefer, public health nutritionist and health educator for the Ohio Health Department's Ohio Diabetes Prevention and Control Program, nationally, 24 million people have diabetes and 57 million have pre-diabetes. The number in Ohio is approaching 1 million. Diabetes is the fifth-leading cause of death in Ohio and the No. 1 cause of adult blindness, amputations, and kidney failure, which is overwhelming the healthcare system. The total estimated cost of diabetes in Ohio annually is nearly \$6 billion dollars. The cost of chronic disease in terms of both money and quality of life is extensive.

**2. Scope of the Program**

- In-State Extension

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

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

**1. Assumptions made for the Program**

Ohio residents are bombarded daily with nutrition and fitness information through the media. Due to the increases in overweight and incidence of chronic diseases, many individuals are seeking answers to their questions regarding a healthy lifestyle. OSU Extension is looked upon as the research based arm of the University and the best source to provide reliable information.

While doctors help patients grapple with the medical side of the disease, diabetics also need basic information about what and how much to eat, and how to prepare meals. Dining with Diabetes is filling the void.

It is guided by social cognitive theory, which emphasizes the interaction of environment, participant, and behavior. If people can see the food and taste it, they're more likely to go home and try it. The informal classroom setting also helps participants learn from each other and form bonds of support.

**2. Ultimate goal(s) of this Program**

Help participants manage their diabetes and reduce blood sugar levels.

**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
2012	15.0	0.0	0.0	0.0
2013	15.0	0.0	0.0	0.0
2014	15.0	0.0	0.0	0.0
2015	15.0	0.0	0.0	0.0
2016	15.0	0.0	0.0	0.0

**V(F). Planned Program (Activity)**

**1. Activity for the Program**

Series of classes offered in participating counties

Newsletter

Training for program team provided by statewide Dining with Diabetes (DWD) Team and invited speakers

Curriculum review and development by DWD Team

Collaborations with agencies to offer programming include: Registered Dietitians, Certified Diabetes Educators, Health Professionals and support at the State level from the Ohio Department of Health

Media releases to promote programming

Partnerships with new organizations with funding sources to support county programming

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

**Extension**

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> <li>● Education Class</li> <li>● Workshop</li> <li>● Group Discussion</li> <li>● One-on-One Intervention</li> <li>● Demonstrations</li> </ul>	<ul style="list-style-type: none"> <li>● Public Service Announcement</li> <li>● Billboards</li> <li>● Newsletters</li> <li>● TV Media Programs</li> <li>● Web sites other than eXtension</li> <li>● Other 1 (Radio Programs)</li> <li>● Other 2 (Pamphlets, Brochures)</li> </ul>

**3. Description of targeted audience**

The Dining with Diabetes Program targets individuals with diabetes and their caregivers/family support members.

**V(G). Planned Program (Outputs)**

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
  - Direct Adult Contacts
  - Indirect Adult Contacts
  - Direct Youth Contacts
  - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

## **V(H). State Defined Outputs**

### **1. Output Measure**

- Number of classes
  
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

**V(I). State Defined Outcome**

<b>O. No</b>	<b>Outcome Name</b>
1	Number of participants whose knowledge of diabetes management has increased.
2	Number of participants who are able to count carbohydrates.
3	Number of participants who are eating smaller portion sizes.
4	Number of participants who have lowered blood sugar levels.

**Outcome # 1**

**1. Outcome Target**

Number of participants whose knowledge of diabetes management has increased.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:1000                  2013:1000                  2014:1000                  2015:1000                  2016:1000**

**3. Associated Knowledge Area(s)**

- 703 - Nutrition Education and Behavior

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 2**

**1. Outcome Target**

Number of participants who are able to count carbohydrates.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:800                  2013:800                  2014:800                  2015:800                  2016:800**

**3. Associated Knowledge Area(s)**

- 703 - Nutrition Education and Behavior

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 3**

**1. Outcome Target**

Number of participants who are eating smaller portion sizes.



**2. Outcome Type : Change in Action Outcome Measure**

**2012:700                      2013:700                      2014:700                      2015:700                      2016:700**

**3. Associated Knowledge Area(s)**

- 703 - Nutrition Education and Behavior

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 4**

**1. Outcome Target**

Number of participants who have lowered blood sugar levels.

**2. Outcome Type : Change in Condition Outcome Measure**

**2012:500                      2013:500                      2014:500                      2015:500                      2016:500**

**3. Associated Knowledge Area(s)**

- 703 - Nutrition Education and Behavior

**4. Associated Institute Type(s)**

- 1862 Extension

**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
- Competing Public priorities
- Competing Programmatic Challenges

**Description**

{NO DATA ENTERED}

**V(K). Planned Program - Planned Evaluation Studies**

**Description of Planned Evaluation Studies**

Evaluation instruments are specifically designed for each program and vary in content, delivery method and sample size.

## **V(A). Planned Program (Summary)**

### **Program # 16**

#### **1. Name of the Planned Program**

Increasing Profitable Crop Yields Above Trendline-2014 (Extension)

#### **2. Brief summary about Planned Program**

The Agronomic Industry in the State of Ohio has \$1.9 billion dollars of cash receipts generated on 55,577 farms involving 8.4 million acres for corn, soybean and wheat production. These commodities provide feed stocks for livestock and manufacturing industries throughout the state, giving economic and environmental impacts that directly or indirectly affect most Ohio citizens. Economic impacts of production practices to farm profitability are evaluated in conjunction with the environmental consequences. Economic impacts include reduced input cost, efficiency in input utilization and identification of enhanced income crop sectors.

Increasing Profitable Crop Yields Above Trendline-2014 aims to meet the growing demand for food, feed, fiber, fuel, and industrial uses of Ohio's crops. The year 2014 celebrates the 100th year of Extension education - at a time when new methods are needed to meet a growing crisis in world food and energy production. This multi-disciplinary program uses OSU Extension resources to help the agribusiness industry and producers get the most profit and product out of our farmland, while being environmentally and socially responsible. Even information provided in newsletters helps - for example, the value in 2007 of CORN (the Crop Observation and Recommendation Network) was estimated at more than \$9 million in reduced crop production costs and/or increased yields.

**3. Program existence :** Mature (More than 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

<b>KA Code</b>	<b>Knowledge Area</b>	<b>%1862 Extension</b>	<b>%1890 Extension</b>	<b>%1862 Research</b>	<b>%1890 Research</b>
102	Soil, Plant, Water, Nutrient Relationships	10%		10%	
133	Pollution Prevention and Mitigation	5%		5%	
205	Plant Management Systems	20%		20%	
211	Insects, Mites, and Other Arthropods Affecting Plants	15%		15%	
212	Pathogens and Nematodes Affecting Plants	13%		13%	
213	Weeds Affecting Plants	20%		20%	
402	Engineering Systems and Equipment	7%		7%	
601	Economics of Agricultural Production and Farm Management	5%		5%	
	<b>Total</b>	95%		95%	

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

## 1. Situation and priorities

Food shortages, alternative crop uses, and climate changes have triggered three major global food crises over the past century. As populations soar, ethanol production increases, and more environmental stewardship initiatives take root, the capacity of the world's food supply will be stretched to its limit. Eventually, demand will outpace supply. Crop production trendlines are not keeping up with current population growth. One solution is to take our limited farm acres and produce more food, fuel, and fiber crops from that land. Every acre of ground must produce as much as it is environmentally, genetically, and technologically possible to produce.

Target audiences for direct involvement in these programs include farmers, agri-industry, and governmental agencies. The program includes specific areas of plant production including pest (weed, insect & disease) management, soil fertility, tillage/soil erosion, soil water/drainage, precision application of inputs and plant genetic evaluation.

## 2. Scope of the Program

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

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

## 1. Assumptions made for the Program

Ohio, a leader in agriculture, food processing, and bioproduct innovations, is strategically positioned to meet the growing demands of the food, fuel, and fiber industries. OSU Extension is leading the efforts with this new multidisciplinary program that assists agribusinesses and producers to increase profitable crop yields in a socially and environmentally responsible way, adding more raw commodities for Ohio's business growth and export markets. This program utilizes the resources available to Ohio's Agronomic Crop Industry to help individuals maintain economically viable and environmentally compatible crop enterprises.

Many of the programs conducted are long term and proven methods to reach audiences with research based information and education. Adapting the programs and information for use of technology (web and broadcast) to reach new audience and efficiently delivery the program while balanced with a high touch philosophy are the challenge.

Focus group surveys of clientele have identified the following factors: Challenges identified included profitably fitting technology into production systems, economic challenges, and information overload. Profitably fitting technology into production is typified by examples such as Roundup Ready Technology, general GMO/conventional variety market demand shifts and seed treatments. Economic challenges included marketing, economies of scales issues and finding technology fits that have economic return. Agronomic information is readily available from many different resources. The difficulty is to know what information is meaningful to individual farming operations, plus issues related to reliability of information based on source. In addition, new pest problems such as soybean aphids were identified as new challenges.

Information gathering for today's farm audience includes:

Internet was the number one mentioned.

Trade magazines were mentioned but seem to be of somewhat limited value Radio was mentioned by one participate due to the hours spent in a vehicle.

Networking with other individuals from a variety of expertise areas

Speed of obtaining an answer has changed. Answers are needed the same day or even within an hour, to meet grower demands. Technology was suggested as an important tool in making timely answers available.

Non-biased information is a valued asset on farms. Research conducted on their farm or in close proximity had preference. Participants place a high value on research in general and like local research with similar soil types, environment, etc. Many do on-farm projects and think Extension could provide value to this activity in three areas: design and planning data analysis and interpretation. Technology (GPS, monitors and controllers) in data generation is another avenue for progress. Providing meaningful projects conducted in a timely manner is valued.

Participants feel the least comfortable with identification of disease and insect problems plus they want to know thresholds that make economic sense. This is the greatest new skill or information they need on their farm. They suggest regional identification workshops and providing pictures in the CORN newsletter.

The CORN newsletter, Pocket Field Guide, Weed Control Guide, and some use of the web site were mentioned as highly valued current products of the Team. Meetings received varied views, from being considered very good, to too much of the same old information. Farmers indicated less time and desire to

go to meetings and workshops for a variety of reasons. Information brought to them through the web, e-mail or possibly localized workshops in season (during a three day rainy period) were most valued for the future.

**2. Ultimate goal(s) of this Program**

Through research, outreach, and education, OSU Extension educators with the Agronomics Crops, Forage, and Fruit and Vegetable teams will continue to strive to support the demands of crop and livestock producers while finding new crops for alternative energy and new ways to manage the land.

Long-term goals include:

Improve nutrient utilization efficiency on the farm and reduce environmental impact from added nutrients.

Help producers manage herbicide resistant weed and weed population shifts. Document weed population shifts and provide information to producers.

Help producers better manage insect population shifts. Document insect population shifts and provide information to producers. Develop threshold information for management of insects in field crops.

Help producers better manage disease. Document disease presence, yield loss potential and provide information to producers. Develop threshold information for management of diseases in field crops.

Maximize profit on the farm and minimize the environmental impact of agronomic crop production in Ohio.

Producers adapt technology which can have safety, efficiency and better input utilization impact on the farm.

Provide accurate and timely information, educational opportunities and conduct research projects addressing the needs of Ohio's agronomic crop industry.

**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
2012	10.0	0.0	0.0	0.0
2013	10.0	0.0	0.0	0.0
2014	10.0	0.0	0.0	0.0
2015	10.0	0.0	0.0	0.0
2016	10.0	0.0	0.0	0.0

**V(F). Planned Program (Activity)**

**1. Activity for the Program**

The program includes specific areas of plant production including pest (weed, insect & disease) management, soil fertility, tillage/soil erosion, soil water/drainage, precision application of inputs and plant genetic evaluation.

Increasing field crop yields through technology adoption.

Producing high-value crops on small tracts of land.

Growing alternative crops for bioenergy.

Crop Observation and Recommendation Network Newsletter

Crop Production Conference

Crop Profit

Multiple Regional/Local Agronomy Meeting/Workshops

Website

Local/On-Farm Research

Field Days

Bulletins/Fact Sheets/Publications

Work with Media and OSU Communications Technology

Building relationships with commodity organizations and agencies

Build relationships across other teams in OSU Extension.

Computer training on technologies for agronomic applications

Precision ag data management analysis and decision workshops

Develop educational programs and tools to improve the efficiency of nitrogen utilization to improve farm economics and reduce environmental impact.

Develop a user friendly manure nutrient credit spreadsheet for livestock and crop producers

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

**Extension**

<b>Direct Methods</b>	<b>Indirect Methods</b>
-----------------------	-------------------------

<ul style="list-style-type: none"><li>● Education Class</li><li>● Workshop</li><li>● Group Discussion</li><li>● One-on-One Intervention</li><li>● Demonstrations</li><li>● Other 1 (On-Farm Research)</li></ul>	<ul style="list-style-type: none"><li>● Newsletters</li><li>● Web sites other than eXtension</li><li>● Other 1 (Radio Programs)</li><li>● Other 2 (Webcast)</li></ul>
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### 3. Description of targeted audience

Grain Producers and cash forages of both commercial size and part-time

Agriculture Industry- Fertilizer chemical retailers, Input company representatives, crop advisors

Certified Crop Advisors

Non-agronomic specialized educators

Agency Soil and Water Conservation Districts, Natural Resources Conservation Service, Ohio Department of Agriculture and Environmental Protection Agency

### V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
  - Direct Adult Contacts
  - Indirect Adult Contacts
  - Direct Youth Contacts
  - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.



## **V(H). State Defined Outputs**

### **1. Output Measure**

- Crop Observation and Recommendation Network Newsletter distribution
  - Number of participants reached with agronomic information provided in Regional/Local Agronomy Meetings
  - Website which reaches an estimated 60,000 hits per year
  - Local/On-Farm Research project sites.
  - Number of participants in annual Field Days
  - Weed Control Guide for Ohio and Indiana distribution
  - Field Crop Insects of Ohio distribution available via web only updated annually
  - Corn, Soybean, Wheat and Alfalfa Field Guides distributed
  - Resource Guides on Pest-Insect, Disease and profitable production.
  - Ohio Agronomy Guide distribution
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

**V(I). State Defined Outcome**

O. No	Outcome Name
1	Number of meeting participants will indicate they will implement new management practices based on information received at the meetings.
2	Number of crop production acres that will impliment BMP's for nutrient management.
3	Number of crop production acres that implement weed resistance management strategies.
4	Number of Ohio crop acres where appropriate utilization of IPM practices occurs
5	Number of individuals taught about disease identification, control and scouting or key weed control concepts.
6	Number of farmers reporting positive changes in management and or profitability of their farm from use of the disease identification, control and scouting or key weed control concepts.
7	Number of farmers reporting positive changes in management and or profitability of their farm from use of information from farm financial analysis.
8	Reported economic impact of cost savings, increased yield or other increased profitability from use of CORN newsletter reported as total dollars.

**Outcome # 1**

**1. Outcome Target**

Number of meeting participants will indicate they will implement new management practices based on information received at the meetings.

**2. Outcome Type : Change in Action Outcome Measure**

**2012:1250                      2013:1250                      2014:1250                      2015:1125                      2016:1300**

**3. Associated Knowledge Area(s)**

- 102 - Soil, Plant, Water, Nutrient Relationships
- 133 - Pollution Prevention and Mitigation
- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 213 - Weeds Affecting Plants
- 402 - Engineering Systems and Equipment
- 601 - Economics of Agricultural Production and Farm Management

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 2**

**1. Outcome Target**

Number of crop production acres that will impliment BMP's for nutrient management.

**2. Outcome Type : Change in Action Outcome Measure**

**2012:1000000                      2013:1000000                      2014:1200000                      2015:1400000                      2016:1600000**

**3. Associated Knowledge Area(s)**

- 102 - Soil, Plant, Water, Nutrient Relationships
- 133 - Pollution Prevention and Mitigation
- 205 - Plant Management Systems

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 3**

**1. Outcome Target**

Number of crop production acres that implement weed resistance management strategies.

**2. Outcome Type : Change in Action Outcome Measure**

**2012:1000      2013:1000      2014:1000      2015:1000      2016:1000000**

**3. Associated Knowledge Area(s)**

- 213 - Weeds Affecting Plants

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 4**

**1. Outcome Target**

Number of Ohio crop acres where appropriate utilization of IPM practices occurs

**2. Outcome Type : Change in Condition Outcome Measure**

**2012:1000000      2013:1000000      2014:1000000      2015:1000000      2016:1000000**

**3. Associated Knowledge Area(s)**

- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 213 - Weeds Affecting Plants

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 5**

**1. Outcome Target**

Number of individuals taught about disease identification, control and scouting or key weed control concepts.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:300                      2013:300                      2014:300                      2015:300                      2016:450**

**3. Associated Knowledge Area(s)**

- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 213 - Weeds Affecting Plants

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 6**

**1. Outcome Target**

Number of farmers reporting positive changes in management and or profitability of their farm from use of the disease identification, control and scouting or key weed control concepts.

**2. Outcome Type : Change in Action Outcome Measure**

**2012:350                      2013:450                      2014:550                      2015:650                      2016:750**

**3. Associated Knowledge Area(s)**

- 102 - Soil, Plant, Water, Nutrient Relationships
- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 213 - Weeds Affecting Plants
- 601 - Economics of Agricultural Production and Farm Management

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 7**

**1. Outcome Target**

Number of farmers reporting positive changes in management and or profitability of their farm from use of information from farm financial analysis.

**2. Outcome Type : Change in Action Outcome Measure**

**2012:450                      2013:550                      2014:650                      2015:750                      2016:850**

**3. Associated Knowledge Area(s)**

- 205 - Plant Management Systems
- 402 - Engineering Systems and Equipment
- 601 - Economics of Agricultural Production and Farm Management

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 8**

**1. Outcome Target**

Reported economic impact of cost savings, increased yield or other increased profitability from use of CORN newsletter reported as total dollars.

**2. Outcome Type : Change in Condition Outcome Measure**

**2012:8500000                      2013:9500000                      2014:10500000                      2015:11500000                      2016:11500000**

**3. Associated Knowledge Area(s)**

- 102 - Soil, Plant, Water, Nutrient Relationships
- 133 - Pollution Prevention and Mitigation
- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 213 - Weeds Affecting Plants
- 402 - Engineering Systems and Equipment
- 601 - Economics of Agricultural Production and Farm Management

**4. Associated Institute Type(s)**

- 1862 Extension

**V(J). Planned Program (External Factors)**

**1. External Factors which may affect Outcomes**

- Natural Disasters (drought, weather extremes, etc.)
- Economy

- Appropriations changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges

**Description**

{NO DATA ENTERED}

**V(K). Planned Program - Planned Evaluation Studies**

**Description of Planned Evaluation Studies**

{NO DATA ENTERED}

**V(A). Planned Program (Summary)**

**Program # 17**

**1. Name of the Planned Program**

New Start for Financial Success (Extension)

**2. Brief summary about Planned Program**

New Start For Financial Success literally offers a "new start" for Ohio families and households who file bankruptcy. To discharge their debt by filing bankruptcy, clients must first complete a debtor education class. To fill this need, Extension developed New Start, a Department of Justice-approved class that follows U.S. Bankruptcy Court guidelines. Participants receive a certificate of completion to give to the court. Now in 44 Ohio counties, New Start has been a well-received local option for bankruptcy filers. This program is an example of long-term teamwork between the OSU Healthy Finances team and the Ohio Department of Justice. The two-hour class allows Ohioans to meet the bankruptcy law's post-filing debtor education requirement and give them a fresh, new start to financial freedom. New Start is taught by OSU Extension family and consumer science educators who are skilled in teaching personal finance using a nonjudgmental, practical approach.

**3. Program existence :** Intermediate (One to five years)

**4. Program duration :** Medium Term (One to 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
801	Individual and Family Resource Management	100%		100%	
	<b>Total</b>	100%		100%	

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

**1. Situation and priorities**

With bankruptcies on the rise Ohio saw a 14 percent increase the first six months of 2008 compared with a year earlier. The "New Start for Financial Success" program helps get people-back on their feet and keeps them there with tools for long-term financial success. New Start also satisfies financial management class requirements for filers of bankruptcy, and offers the classes locally, in 44 of Ohio's counties. New Start is designated as an Extension Signature Program. OSU Extension is approved to issue certificates to bankruptcy filers who must complete a Personal Finance Instruction Course (Debtor Education) before debts can be discharged. Because OSU Extension is one of many approved to issue the certificates, we are operating in a more competitive market. Professionals and individuals alike can gain from planning and being more prepared for the future. Communications is a key to positive family relationships and making sound financial decisions.



**2. Scope of the Program**

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

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

**1. Assumptions made for the Program**

Families are declaring bankruptcy and need to complete the requirements of the 2005 bankruptcy laws. New Start was designed to increase the financial knowledge and skills of participants in an attempt to prevent the person from becoming a repeat bankruptcy filer.

**2. Ultimate goal(s) of this Program**

Program participants will increase their knowledge of developing a spending plan and budget, how they got into financial trouble, wise use of credit, and consumer information on spending.

Overall goal is that the bankruptcy filer learns enough information and applies enough of the financial principles to their financial life that they have a new start and do not find themselves repeating the mistakes that forced them into bankruptcy.

**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
2012	3.5	0.0	0.0	0.0
2013	2.5	0.0	0.0	0.0
2014	1.5	0.0	0.0	0.0
2015	1.5	0.0	0.0	0.0
2016	0.0	0.0	0.0	0.0

**V(F). Planned Program (Activity)**

**1. Activity for the Program**

Two-hour course approved by the Department of Justice.

The subjects covered are budget development, money management, wise credit use and consumer information.

Competitors have arisen in most communities where the New Start course has been offered. Attorney's prefer to send clients to the same provider for both credit counseling and personal finance education. Unfortunately, OSU Extension educators are not certified to be credit counselors, so that now the referrals are going to other agencies who can offer both to bankruptcy filers. Most educators

will not be offering the class in 2012 and beyond because of the funding and referral issues.

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

**Extension**

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> <li>● Education Class</li> <li>● Workshop</li> <li>● Group Discussion</li> <li>● One-on-One Intervention</li> </ul>	<ul style="list-style-type: none"> <li>● Newsletters</li> <li>● Web sites other than eXtension</li> </ul>

**3. Description of targeted audience**

Bankruptcy filers

**V(G). Planned Program (Outputs)**

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
  - Direct Adult Contacts
  - Indirect Adult Contacts
  - Direct Youth Contacts
  - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

**V(H). State Defined Outputs**

**1. Output Measure**

- # of educational sessions

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

**V(I). State Defined Outcome**

<b>O. No</b>	<b>Outcome Name</b>
1	Number of participants indicating they will use a budget at home.
2	Number of participants indicating they were more likely to set aside money for occasional expenses.
3	Number of participants indicating they were more likely to set aside money for unplanned expenses.
4	Number of participants indicating they were more likely to save money toward a goal.
5	Number of participants indicating they were more likely to keep debt below 20% of take-home pay.
6	Number of participants indicating they were more likely to adjust spending to match income.
7	Number of participants indicating they were more likely to know where their money goes.

**Outcome # 1**

**1. Outcome Target**

Number of participants indicating they will use a budget at home.

**2. Outcome Type : Change in Action Outcome Measure**

**2012:250                      2013:250                      2014:250                      2015:250                      2016:0**

**3. Associated Knowledge Area(s)**

- 801 - Individual and Family Resource Management

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 2**

**1. Outcome Target**

Number of participants indicating they were more likely to set aside money for occasional expenses.

**2. Outcome Type : Change in Action Outcome Measure**

**2012:250                      2013:250                      2014:250                      2015:250                      2016:80**

**3. Associated Knowledge Area(s)**

- 801 - Individual and Family Resource Management

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 3**

**1. Outcome Target**

Number of participants indicating they were more likely to set aside money for unplanned expenses.

**2. Outcome Type : Change in Action Outcome Measure**

**2012:250                      2013:250                      2014:250                      2015:250                      2016:0**

**3. Associated Knowledge Area(s)**

- 801 - Individual and Family Resource Management

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 4**

**1. Outcome Target**

Number of participants indicating they were more likely to save money toward a goal.

**2. Outcome Type : Change in Action Outcome Measure**

**2012:250                      2013:250                      2014:250                      2015:250                      2016:0**

**3. Associated Knowledge Area(s)**

- 801 - Individual and Family Resource Management

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 5**

**1. Outcome Target**

Number of participants indicating they were more likely to keep debt below 20% of take-home pay.

**2. Outcome Type : Change in Action Outcome Measure**

**2012:250                      2013:250                      2014:250                      2015:250                      2016:0**

**3. Associated Knowledge Area(s)**

- 801 - Individual and Family Resource Management

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 6**

**1. Outcome Target**

Number of participants indicating they were more likely to adjust spending to match income.

**2. Outcome Type : Change in Action Outcome Measure**

**2012:250                  2013:250                  2014:250                  2015:250                  2016:100**

**3. Associated Knowledge Area(s)**

- 801 - Individual and Family Resource Management

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 7**

**1. Outcome Target**

Number of participants indicating they were more likely to know where their money goes.

**2. Outcome Type : Change in Action Outcome Measure**

**2012:250                  2013:250                  2014:250                  2015:250                  2016:100**

**3. Associated Knowledge Area(s)**

- 801 - Individual and Family Resource Management

**4. Associated Institute Type(s)**

- 1862 Extension

**V(J). Planned Program (External Factors)**

**1. External Factors which may affect Outcomes**

- Economy
- Appropriations changes

- Public Policy changes
- Government Regulations

**Description**

Competitors have arisen in most communities where the New Start course has been offered. Attorney's prefer to send clients to the same provider for both credit counseling and personal finance education. Unfortunately, OSU Extension educators are not certified to be credit counselors, so that now the referrals are going to other agencies who can offer both to bankruptcy filers. Most educators will not be offering the class in 2012 and beyond because of the funding and referral issues.

**V(K). Planned Program - Planned Evaluation Studies**

**Description of Planned Evaluation Studies**

At this time (2010), the evaluation is conducted as a retrospective procedure, asking participants what they plan to do after the program and what they were doing before the program with regard to a set of money management behaviors.

Bankruptcy law requires that we collect evaluations from New Start participants, but we cannot withhold certificates of completion if they do not complete an evaluation. A few providers (county educators) have a system for a 6-month follow-up evaluation. We hope to get more providers to do so as well.

## **V(A). Planned Program (Summary)**

### **Program # 18**

#### **1. Name of the Planned Program**

Real Money, Real World (Extension)

#### **2. Brief summary about Planned Program**

Real Money, Real World is an active, hands-on experience that gives young people the opportunity to make lifestyle and budget choices similar to those they will make as adults. It is intended to be a partnership of the county OSU Extension office, the school, and the business community. The program consists of three parts: a pre-simulation preparation, a hands-on budget management and decision-making simulation and a post-session evaluation of choices made.

Prior to the simulation, teachers prepare students for the simulation by going through the following four simple lessons:

- Lesson 1: How Occupation Affects Income
- Lesson 2: Deductions—What You See Is Not What You Get
- Lesson 3: How to Use Checking and Savings Accounts
- Lesson 4: Making Choices—Preparing for the Simulation

The participants select or are assigned occupations, then receive a monthly salary for that occupation, and a savings and checking account register. After subtracting the savings, taxes, and health insurance amounts, the "net" salary figure is deposited into the checking account and recorded in the check register. Then in Lesson 5, students proceed through the Real Money, Real World simulation. The simulation normally lasts about an hour. Community volunteers set up and staff booths representing real-life businesses. In this simulation, participants are to assume that they have completed basic educational requirements for their chosen career and are the sole income providers for their families. Students spend their "salaries" on items found in a typical monthly budget. They do this by visiting the appropriate booths: housing, transportation, insurance, utilities, food, clothing, entertainment, child care, communications, contributions, and credit. In addition, chance and financial advice booths are included. Throughout the activity, the participants keep track of their finances by recording them in the check register. Whether they have adequate funds or run out of money, they continue through the simulation and finish with either a positive or negative balance. In Lesson 6, teachers and students discuss the Real Money, Real World experience. Students complete a participant survey to evaluate the program and their experience with it.

**3. Program existence :** Intermediate (One to 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
801	Individual and Family Resource Management	20%		0%	
806	Youth Development	80%		0%	
	<b>Total</b>	100%		0%	

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

## 1. Situation and priorities

Anyone raising a teenager who covets a \$200 cell phone knows that the earlier people begin their financial education the better. Enter Real Money, Real World a program that teaches high school students money management skills they will use for the rest of their lives. Alarming levels of debt, bankruptcies, and foreclosures throughout Ohio add up to a clear conclusion the state has a vital need for financial education. And starting early is key: a 2008 national survey revealed that high-school seniors could correctly answer just 48 percent of questions on financial basics such as credit, savings, insurance, and retirement. A 2008 evaluation of 3, 563 Ohio Real Money, Real World participants showed that the program raises awareness about the costs to maintain a household and the interrelationships among educational levels, jobs, and income.

## 2. Scope of the Program

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

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

## 1. Assumptions made for the Program

Real Money, Real World simulates real-life experiences to help make youth aware of the money management skills they need to be productive, successful members of society. The curriculum focuses on creating awareness of the correlation between education and earning power, and many classroom teachers are telling us this is one of the best finance teaching tools they've ever had. Real Money, Real World has been endorsed by the Ohio Treasurer of State's consumer finance Web site, and it supports standards of S.B. 311, which requires that Ohio high schools implement personal financial education programs for students entering high school in 2010. This eye-opening program is successful because of ongoing cooperation between county Extension offices, local schools and the business community; the OSUE Healthy Finances team; and the Workforce Preparation team.

## 2. Ultimate goal(s) of this Program

Goals of the Real Money, Real World program are: to increase participants' awareness that level of education and career influence future income; to help participants understand that spending money on one

thing affects what they can spend on other things; and to increase participants' awareness that income and lifestyle choices affect the amount of money available for discretionary spending.

**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
2012	3.0	0.0	0.0	0.0
2013	3.0	0.0	0.0	0.0
2014	3.0	0.0	0.0	0.0
2015	3.0	0.0	0.0	0.0
2016	3.0	0.0	0.0	0.0

**V(F). Planned Program (Activity)**

**1. Activity for the Program**

Real Money, Real World consists of a six-lesson curriculum to help young people become aware of the money-management skills they'll need for the rest of their lives. Designed to be a partnership of local Extension educators, schools, and community volunteers, the program focuses on basic finance principles, including how education and occupation affect income; how expenses and paycheck deductions add up; and how to be smart in using checking accounts, savings, and credit.

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

Extension	
Direct Methods	Indirect Methods
<ul style="list-style-type: none"> <li>● Education Class</li> <li>● Workshop</li> <li>● Group Discussion</li> <li>● One-on-One Intervention</li> <li>● Demonstrations</li> </ul>	<ul style="list-style-type: none"> <li>● Web sites other than eXtension</li> <li>● Other 1 (Pod Casts)</li> </ul>

**3. Description of targeted audience**

Ohio Youth Grades 5 to 9.

### **V(G). Planned Program (Outputs)**

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
    - Direct Adult Contacts
    - Indirect Adult Contacts
    - Direct Youth Contacts
    - Indirect Youth Contact
  - Number of patents submitted
  - Number of peer reviewed publications
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

### **V(H). State Defined Outputs**

#### **1. Output Measure**

- Total number of volunteers participating in the planning and implementation of this program (e.g., committee members, teachers/trainers, unpaid staff, etc.)
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

**V(I). State Defined Outcome**

O. No	Outcome Name
1	Number of participants who increased awareness about what it costs to maintain a household.
2	Number of participants who increased awareness about how every spending decision affects other spending opportunities.
3	Number of participants who increased awareness about how the type of job they have affects how much money they will make.
4	Number of participants who increased feeling of importance about getting more education or training after high school.
5	Number of participants who increased feeling of importance about waiting to have children until financially ready.
6	Number of participants who increased feeling of importance about having a plan for spending that includes both needs and wants.
7	Number of participants who indicated their likeliness to make changes relative to getting more education or training after high school.
8	Number of participants who indicated their likeliness to make changes relative to learning how to make wise financial decisions.

**Outcome # 1**

**1. Outcome Target**

Number of participants who increased awareness about what it costs to maintain a household.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:5000                      2013:5000                      2014:5000                      2015:5000                      2016:10000**

**3. Associated Knowledge Area(s)**

- 801 - Individual and Family Resource Management
- 806 - Youth Development

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 2**

**1. Outcome Target**

Number of participants who increased awareness about how every spending decision affects other spending opportunities.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:5000                      2013:5000                      2014:5000                      2015:5000                      2016:11000**

**3. Associated Knowledge Area(s)**

- 801 - Individual and Family Resource Management
- 806 - Youth Development

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 3**

**1. Outcome Target**

Number of participants who increased awareness about how the type of job they have affects how much money they will make.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:4500                      2013:4500                      2014:4500                      2015:4500                      2016:10000**

**3. Associated Knowledge Area(s)**

- 801 - Individual and Family Resource Management
- 806 - Youth Development

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 4**

**1. Outcome Target**

Number of participants who increased feeling of importance about getting more education or training after high school.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:4000                      2013:4000                      2014:4000                      2015:4000                      2016:10000**

**3. Associated Knowledge Area(s)**

- 801 - Individual and Family Resource Management
- 806 - Youth Development

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 5**

**1. Outcome Target**

Number of participants who increased feeling of importance about waiting to have children until financially ready.

**2. Outcome Type : Change in Action Outcome Measure**

**2012:4500                      2013:4500                      2014:4500                      2015:4500                      2016:10000**

**3. Associated Knowledge Area(s)**

- 801 - Individual and Family Resource Management
- 806 - Youth Development

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 6**

**1. Outcome Target**

Number of participants who increased feeling of importance about having a plan for spending that includes both needs and wants.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:4500                  2013:4500                  2014:4500                  2015:4500                  2016:10000**

**3. Associated Knowledge Area(s)**

- 801 - Individual and Family Resource Management
- 806 - Youth Development

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 7**

**1. Outcome Target**

Number of participants who indicated their likeliness to make changes relative to getting more education or training after high school.

**2. Outcome Type : Change in Action Outcome Measure**

**2012:4500                  2013:4500                  2014:4500                  2015:4500                  2016:10000**

**3. Associated Knowledge Area(s)**

- 801 - Individual and Family Resource Management
- 806 - Youth Development

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 8**

**1. Outcome Target**

Number of participants who indicated their likeliness to make changes relative to learning how to make wise financial decisions.

**2. Outcome Type : Change in Action Outcome Measure**

**2012:5000                      2013:5000                      2014:5000                      2015:5000                      2016:10000**

**3. Associated Knowledge Area(s)**

- 801 - Individual and Family Resource Management
- 806 - Youth Development

**4. Associated Institute Type(s)**

- 1862 Extension

**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

**Description**

{NO DATA ENTERED}

**V(K). Planned Program - Planned Evaluation Studies**

**Description of Planned Evaluation Studies**

{NO DATA ENTERED}



**V(A). Planned Program (Summary)**

**Program # 19**

**1. Name of the Planned Program**

Why Trees Matter: Next STEP (Extension)

**2. Brief summary about Planned Program**

The Why Trees Matter: Next STEP program helps OSU Extension calculate the dollar value of trees' environmental functions, shows types of trees that do this work the best, and demonstrates that community forests have significant economic, environmental and social benefits. New research-based tools provide information on energy savings, storm water remediation, air quality, and carbon sequestration of individual trees and plantings. The program was started in 2005, and currently involves OSUE educators and specialists in the ANR, CD, and 4-H program areas. Why Trees Matter focuses on the economic, environmental and social benefits of trees to Ohio citizens and communities. With the teachable moment for Ohioans of the importance of invasive species, the environmental services of trees, and the emerging emphasis of green infrastructure for sustainability, the time for Why Trees Matter is now.

**3. Program existence :** Intermediate (One to five years)

**4. Program duration :** Medium Term (One to 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

<b>KA Code</b>	<b>Knowledge Area</b>	<b>%1862 Extension</b>	<b>%1890 Extension</b>	<b>%1862 Research</b>	<b>%1890 Research</b>
104	Protect Soil from Harmful Effects of Natural Elements	5%		0%	
112	Watershed Protection and Management	20%		0%	
124	Urban Forestry	20%		0%	
141	Air Resource Protection and Management	20%		0%	
605	Natural Resource and Environmental Economics	15%		0%	
608	Community Resource Planning and Development	20%		0%	
	<b>Total</b>	100%		0%	

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

**1. Situation and priorities**

Threats from new pests such as the emerald ash borer, the development of powerful new tools to calculate the benefits of trees specifically, science-based software called i-Tree (jointly developed by The Davey

Tree Expert Company, the Arbor Day Foundation, and the U.S. Forest Service) - and greater attention to "green" city planning combine to drive the effort.

**2. Scope of the Program**

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

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

**1. Assumptions made for the Program**

The program also includes 130 research sites throughout Ohio as part of the Ohio Street Tree Evaluation Program, development of the new Tree Research Evaluation and Extension plot at Secrest Arboretum, training of volunteer master tree stewards, and development of curricula/resources for educational programming.

**2. Ultimate goal(s) of this Program**

The goal is to develop public awareness and understanding of trees and the environmental services they provide. The long-term goal is an increase in tree canopy for Ohio communities, which translates to energy savings, carbon credits for governmental entities, improved air and water quality, and greater environmental awareness by Ohio citizens.

**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
2012	10.0	0.0	0.0	0.0
2013	10.0	0.0	0.0	0.0
2014	10.0	0.0	0.0	0.0
2015	10.0	0.0	0.0	0.0
2016	10.0	0.0	0.0	0.0

**V(F). Planned Program (Activity)**

**1. Activity for the Program**

The Ohio Street Tree Evaluation Program (OSTEP), with 130 statewide research sites, aims to secure long-term data on how specific tree types look, last, and serve the environment.

The Community Tree Research Evaluation and Extension (TREE) Plot in the Ohio Agricultural Research and Development Center's Secrest Arboretum supports replicated plantings of key street-tree types, demonstration plots of trees' environmental benefits, and evaluation plots of new varieties.

The "Ohio Trees" Master Gardener Specialization Program trains volunteers for community street-tree projects.

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

<b>Extension</b>	
<b>Direct Methods</b>	<b>Indirect Methods</b>
<ul style="list-style-type: none"> <li>● Education Class</li> <li>● Workshop</li> <li>● Group Discussion</li> <li>● One-on-One Intervention</li> <li>● Demonstrations</li> </ul>	<ul style="list-style-type: none"> <li>● Newsletters</li> <li>● Web sites other than eXtension</li> <li>● Other 1 (Pod Casts)</li> </ul>

**3. Description of targeted audience**

Ohio citizens

Community Leaders/Officials

Master Volunteers

**V(G). Planned Program (Outputs)**

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
  - Direct Adult Contacts
  - Indirect Adult Contacts
  - Direct Youth Contacts
  - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

## **V(H). State Defined Outputs**

### **1. Output Measure**

- Number of programs presented.
- Number of volunteers participating in WTM educational programs.
- Number of volunteer hours committed to WTM programs.
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

**V(I). State Defined Outcome**

<b>O. No</b>	<b>Outcome Name</b>
1	Number of participants that appreciate the value of community forests.
2	Number of participants that have improved knowledge of tree identification.
3	Dollar value of energy savings to Ohioans documented from WTM studies in local communities.
4	Dollar value of storm water remediation savings documented from WTM studies in local communities.
5	Dollar value of air quality benefits documented from WTM studies in local communities.

**Outcome # 1**

**1. Outcome Target**

Number of participants that appreciate the value of community forests.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:200                      2013:200                      2014:200                      2015:200                      2016:200**

**3. Associated Knowledge Area(s)**

- 104 - Protect Soil from Harmful Effects of Natural Elements
- 112 - Watershed Protection and Management
- 124 - Urban Forestry
- 141 - Air Resource Protection and Management
- 605 - Natural Resource and Environmental Economics
- 608 - Community Resource Planning and Development

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 2**

**1. Outcome Target**

Number of participants that have improved knowledge of tree identification.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:150                      2013:150                      2014:150                      2015:150                      2016:150**

**3. Associated Knowledge Area(s)**

- 124 - Urban Forestry

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 3**

**1. Outcome Target**

Dollar value of energy savings to Ohioans documented from WTM studies in local communities.

**2. Outcome Type : Change in Condition Outcome Measure**

**2012:5000000      2013:5000000      2014:5000000      2015:5000000      2016:5000000**

**3. Associated Knowledge Area(s)**

- 605 - Natural Resource and Environmental Economics
- 608 - Community Resource Planning and Development

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 4**

**1. Outcome Target**

Dollar value of storm water remediation savings documented from WTM studies in local communities.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:100000      2013:100000      2014:100000      2015:100000      2016:100000**

**3. Associated Knowledge Area(s)**

- 112 - Watershed Protection and Management
- 124 - Urban Forestry
- 605 - Natural Resource and Environmental Economics

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 5**

**1. Outcome Target**

Dollar value of air quality benefits documented from WTM studies in local communities.

**2. Outcome Type : Change in Condition Outcome Measure**

**2012:15000      2013:15000      2014:15000      2015:15000      2016:15000**

**3. Associated Knowledge Area(s)**

- 141 - Air Resource Protection and Management
- 605 - Natural Resource and Environmental Economics

- 608 - Community Resource Planning and Development

**4. Associated Institute Type(s)**

- 1862 Extension

**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

**Description**

{NO DATA ENTERED}

**V(K). Planned Program - Planned Evaluation Studies**

**Description of Planned Evaluation Studies**

{NO DATA ENTERED}



**V(A). Planned Program (Summary)**

**Program # 20**

**1. Name of the Planned Program**

Advancing Employment and Income Opportunities (Extension)

**2. Brief summary about Planned Program**

Innovation and entrepreneurship will drive Ohio's move to the knowledge economy. OSU Extension is uniquely positioned to help. The Community Economic, Small Business, and Job Development programs of OSU Extension are tailored to local community needs in every county throughout the state, whether metropolitan, rural, or a combination.

**3. Program existence :** Intermediate (One to 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 :** No

**V(B). Program Knowledge Area(s)**

1. Program Knowledge Areas and Percentage

<b>KA Code</b>	<b>Knowledge Area</b>	<b>%1862 Extension</b>	<b>%1890 Extension</b>	<b>%1862 Research</b>	<b>%1890 Research</b>
602	Business Management, Finance, and Taxation	34%		0%	
608	Community Resource Planning and Development	33%		0%	
801	Individual and Family Resource Management	33%		0%	
	<b>Total</b>	100%		0%	

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

**1. Situation and priorities**

Communities, individuals and families must find ways to thrive in the rapidly changing economic environment. Therefore, community leaders and residents need to develop new strategies for addressing these changes.

**2. Scope of the Program**

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

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

**1. Assumptions made for the Program**

By investing in OSU Extension Faculty and Staff time and expertise with the intent to teach community leaders and citizens integrated activities including research, teaching, providing technical assistance, coaching, facilitating and forming coalitions, communities and leaders will implement new strategies.

**2. Ultimate goal(s) of this Program**

Empowering communities, individuals and families to create, expand, and retain economic opportunities.

**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
2012	15.0	0.0	0.0	0.0
2013	15.0	0.0	0.0	0.0
2014	13.0	0.0	0.0	0.0
2015	13.0	0.0	0.0	0.0
2016	12.0	0.0	0.0	0.0

**V(F). Planned Program (Activity)**

**1. Activity for the Program**

- Workshops,
- Programs,
- Curriculum Development,
- Leadership Development,
- Development of on-line resources, and
- Research to build plans and implement strategies;

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

**Extension**

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> <li>• Education Class</li> <li>• Workshop</li> <li>• Group Discussion</li> <li>• One-on-One Intervention</li> <li>• Other 1 (Public Forums)</li> </ul>	<ul style="list-style-type: none"> <li>• Web sites other than eXtension</li> </ul>

### 3. Description of targeted audience

Community Leaders, economic development professionals, citizens (families and individuals)

### V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
  - Direct Adult Contacts
  - Indirect Adult Contacts
  - Direct Youth Contacts
  - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

### V(H). State Defined Outputs

#### 1. Output Measure

- # of volunteers who have participated
- # of volunteer hours

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

**V(I). State Defined Outcome**

<b>O. No</b>	<b>Outcome Name</b>
1	# of participants who increased their financial literacy
2	# of participants who have developed an integrated plan for achieving financial security
3	# of participants who understand their roles in the development of a community economy;
4	# of participants using information to make community decisions
5	# of community plans developed and adopted
6	# of participants who reduced total debt
7	# of jobs created and retained

**Outcome # 1**

**1. Outcome Target**

# of participants who increased their financial literacy

**2. Outcome Type : Change in Knowledge Outcome Measure**

<b>2012:990</b>	<b>2013:990</b>	<b>2014:990</b>	<b>2015:990</b>	<b>2016:300</b>
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**3. Associated Knowledge Area(s)**

- 602 - Business Management, Finance, and Taxation
- 801 - Individual and Family Resource Management

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 2**

**1. Outcome Target**

# of participants who have developed an integrated plan for achieving financial security

**2. Outcome Type : Change in Knowledge Outcome Measure**

<b>2012:500</b>	<b>2013:550</b>	<b>2014:550</b>	<b>2015:550</b>	<b>2016:300</b>
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**3. Associated Knowledge Area(s)**

- 602 - Business Management, Finance, and Taxation
- 801 - Individual and Family Resource Management

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 3**

**1. Outcome Target**

# of participants who understand their roles in the development of a community economy;

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:100                      2013:100                      2014:100                      2015:100                      2016:100**

**3. Associated Knowledge Area(s)**

- 602 - Business Management, Finance, and Taxation
- 608 - Community Resource Planning and Development
- 801 - Individual and Family Resource Management

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 4**

**1. Outcome Target**

# of participants using information to make community decisions

**2. Outcome Type : Change in Action Outcome Measure**

**2012:100                      2013:100                      2014:100                      2015:100                      2016:100**

**3. Associated Knowledge Area(s)**

- 602 - Business Management, Finance, and Taxation
- 608 - Community Resource Planning and Development
- 801 - Individual and Family Resource Management

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 5**

**1. Outcome Target**

# of community plans developed and adopted

**2. Outcome Type : Change in Action Outcome Measure**

**2012:2                      2013:2                      2014:2                      2015:2                      2016:2**

**3. Associated Knowledge Area(s)**

- 602 - Business Management, Finance, and Taxation
- 608 - Community Resource Planning and Development

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 6**

**1. Outcome Target**

# of participants who reduced total debt

**2. Outcome Type : Change in Condition Outcome Measure**

**2012:110                      2013:110                      2014:110                      2015:110                      2016:100**

**3. Associated Knowledge Area(s)**

- 602 - Business Management, Finance, and Taxation
- 801 - Individual and Family Resource Management

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 7**

**1. Outcome Target**

# of jobs created and retained

**2. Outcome Type : Change in Condition Outcome Measure**

**2012:1500                      2013:1500                      2014:1500                      2015:1500                      2016:1500**

**3. Associated Knowledge Area(s)**

- 602 - Business Management, Finance, and Taxation
- 608 - Community Resource Planning and Development
- 801 - Individual and Family Resource Management

**4. Associated Institute Type(s)**

- 1862 Extension

**V(J). Planned Program (External Factors)**

**1. External Factors which may affect Outcomes**

- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges

**Description**

{NO DATA ENTERED}

**V(K). Planned Program - Planned Evaluation Studies**

**Description of Planned Evaluation Studies**

{NO DATA ENTERED}



## **V(A). Planned Program (Summary)**

### **Program # 21**

#### **1. Name of the Planned Program**

Enhancing Agriculture and the Environment (Extension)

#### **2. Brief summary about Planned Program**

Ohio's diverse agricultural, horticultural, and forestry industries contribute more than \$94 billion to the state's economy every year. OSU Extension assists with technology, marketing, and educational support advancing Ohio's position in the global marketplace. OSU Extension also works to enhance and sustain the environment and natural areas in the state, balancing economic advancement with environmental sustainability. OSUE works with farmers to strengthen their businesses, adopt new technology, and improve efficiency while protecting the environment. OSUE helps to grow Ohio's important green industry by creating jobs, improving workforce skills, and enriching the knowledge of professionals in turfgrass management, landscaping, and nursery companies. Using OSUE as a resource, homeowners enhance the value of their homes and communities, and OSUE trains Master Gardener volunteers to apply and share research-based yard and garden information. OSUE protects Ohio's natural environment by working with landowners in managing woodlands and preserving streams and other water resources, such as Lake Erie.

**3. Program existence :** Intermediate (One to 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

<b>KA Code</b>	<b>Knowledge Area</b>	<b>%1862 Extension</b>	<b>%1890 Extension</b>	<b>%1862 Research</b>	<b>%1890 Research</b>
112	Watershed Protection and Management	5%		0%	
123	Management and Sustainability of Forest Resources	5%		0%	
133	Pollution Prevention and Mitigation	5%		0%	
205	Plant Management Systems	10%		0%	
216	Integrated Pest Management Systems	5%		0%	
307	Animal Management Systems	10%		0%	
308	Improved Animal Products (Before Harvest)	10%		0%	
315	Animal Welfare/Well-Being and Protection	10%		0%	
402	Engineering Systems and Equipment	10%		0%	
403	Waste Disposal, Recycling, and Reuse	10%		0%	
601	Economics of Agricultural Production and Farm Management	5%		0%	
602	Business Management, Finance, and Taxation	5%		0%	
603	Market Economics	5%		0%	
721	Insects and Other Pests Affecting Humans	5%		0%	
	<b>Total</b>	100%		0%	

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

## 1. Situation and priorities

Collectively, Ohio's diverse commercial agricultural, horticultural, and forestry industries contribute more than \$94 billion annually to Ohio's economy. Global economic forces, competition for land use, and urban/suburban sprawl will continue to challenge the aforementioned industries to strategically position their businesses to remain sustainable into the future. Transitional agriculture commodity production will continue its bi-modal distribution in farm size and scale with a very small percentage of farm production units contributing an increasing share of total gross production. Small/mid-size farms will continually need to become entrepreneurial by differentiating their commodities and evaluating direct and other value-added marketing alternatives. Continued growth and evolution of Ohio's "green industry" (nursery/landscape, turfgrass, and floriculture) will present unique opportunities for new university investments in research and Extension personnel at the state, regional and county levels to provide timely research-based information.

Ohio is a densely populated state with many metropolitan areas and a rural landscape increasingly occupied by homeowners seeking amenities of country living. Growing metropolitan areas and division of

land into small plots for home construction places heavy demands on the state's fixed land base and other elements of the natural environment, especially water. These factors of growth lead to increased competition among individuals and interest groups regarding the multiple alternative uses of the state's natural endowment of resources. Ohioans are also concerned with overarching issues including global climate change, invasive species, and farm-land preservation. The challenge is to raise awareness and understanding that development should proceed in concert with economic, environmental and societal health.

## **2. Scope of the Program**

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

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

#### **1. Assumptions made for the Program**

OSU Extension Agriculture and Natural Resources program area's multi-disciplinary teams will continue to conduct applied research and identify the most efficient means to disseminate research-based information through just-in-time electronic newsletters, programs, field days and satellite series. Newly identified teams and working groups will be developed as needs and issues are identified by clientele groups.

OSU Extension works in collaboration with others having a stake in the natural environment including individuals, volunteer groups, community leaders, business leaders, elected and appointed officials, and non-government organizations to identify, develop, and deliver educational programs that target the many natural resource use and restoration issues faced by communities and regions,. Extension and its partners provide the educational basis for maintaining and improving the natural resource base while simultaneously striking a balance with sustainable yields from our land, water, forest, and mineral resources.

#### **2. Ultimate goal(s) of this Program**

Ohio's agriculture and green industries will generate a \$4 &ndash 5 million gross increase over the next 5 years through implementation of OSU Research and Extension programs, products, and recommendations.

Incorporate environmental components into programs primarily aimed at producers of agricultural products in Ohio.

### **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
2012	40.0	0.0	0.0	0.0
2013	40.0	0.0	0.0	0.0
2014	35.0	0.0	0.0	0.0
2015	35.0	0.0	0.0	0.0
2016	35.0	0.0	0.0	0.0

**V(F). Planned Program (Activity)**

**1. Activity for the Program**

Develop and deliver curriculum to increase application and utilization of bioenergy applications including waste digesters and cellulosic based technologies by directing energy team to develop and deliver educational programming.

Enhance the adaptation of production techniques through utilization of on-farm research to work directly with producers to evaluate practices to enhance productivity and profitability.

Conduct workshop training sessions for livestock haulers, food animal veterinarians, livestock producers, consultants and integrators.

Prepare and distribute research-based educational materials in the areas of animal welfare and bio-security through worksheets, factsheets, web-based sites, podcasts, and emerging technologies.

Conduct tax education workshops for practitioners.

Pesticide Applicator Training, Small Farm Conferences, Small Farm College, Transitioning Your Farm Business to the Next Generation Workshops, and Women in Agriculture seminars.

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

**Extension**

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> <li>● Education Class</li> <li>● Workshop</li> <li>● One-on-One Intervention</li> <li>● Demonstrations</li> </ul>	<ul style="list-style-type: none"> <li>● Public Service Announcement</li> <li>● Newsletters</li> <li>● Web sites other than eXtension</li> </ul>

### 3. Description of targeted audience

Ohio farm families, commercial green-industry companies, consumer horticulture advocates, commodity/farm advocacy groups, federal/state agricultural/environmental agencies, state-wide consumer groups, volunteer groups, community leaders, business leaders, elected and appointed officials, and non-government organizations

### V(G). Planned Program (Outputs)

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
  - Direct Adult Contacts
  - Indirect Adult Contacts
  - Direct Youth Contacts
  - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

### V(H). State Defined Outputs

#### 1. Output Measure

- number of volunteers involved in delivery and implementation of program.
- number of multi-state partnerships
- Number of people completing the Transitioning Your Farm/Agricultural Business to the Next Generation Workshops

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

**V(I). State Defined Outcome**

O. No	Outcome Name
1	Number of producers that demonstrate an increase in biosecurity knowledge and skills.
2	Number of food animal producers that increase their knowledge of the how to mitigate animal biosecurity hazards and risks on their farm operations and agribusinesses.
3	Increased knowledge of current practices and emerging technology.
4	Number of youth food animal exhibitors at county fair youth livestock shows that implement animal ID or quality assurance programs.
5	Number of producers (or units represented) adopting energy efficient practices (energy conservation plans, more efficient equipment, etc.)
6	Increase profitability for the food animal sector of the Ohio agricultural industry.
7	Number of Schedule "F" tax forms filed by tax practitioners that participated in OSU Income Tax Schools.
8	Number of farms using transitioning planning.

**Outcome # 1**

**1. Outcome Target**

Number of producers that demonstrate an increase in biosecurity knowledge and skills.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:800                      2013:800                      2014:800                      2015:800                      2016:800**

**3. Associated Knowledge Area(s)**

- 112 - Watershed Protection and Management
- 123 - Management and Sustainability of Forest Resources
- 133 - Pollution Prevention and Mitigation
- 216 - Integrated Pest Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 403 - Waste Disposal, Recycling, and Reuse

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 2**

**1. Outcome Target**

Number of food animal producers that increase their knowledge of the how to mitigate animal biosecurity hazards and risks on their farm operations and agribusinesses.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:10                      2013:15                      2014:20                      2015:25                      2016:30**

**3. Associated Knowledge Area(s)**

- 133 - Pollution Prevention and Mitigation
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 315 - Animal Welfare/Well-Being and Protection
- 402 - Engineering Systems and Equipment

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 3**

**1. Outcome Target**

Increased knowledge of current practices and emerging technology.

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:5000                      2013:5000                      2014:5500                      2015:5500                      2016:6000**

**3. Associated Knowledge Area(s)**

- 112 - Watershed Protection and Management
- 123 - Management and Sustainability of Forest Resources
- 133 - Pollution Prevention and Mitigation
- 205 - Plant Management Systems
- 216 - Integrated Pest Management Systems
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 315 - Animal Welfare/Well-Being and Protection
- 402 - Engineering Systems and Equipment
- 403 - Waste Disposal, Recycling, and Reuse
- 601 - Economics of Agricultural Production and Farm Management

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 4**

**1. Outcome Target**

Number of youth food animal exhibitors at county fair youth livestock shows that implement animal ID or quality assurance programs.

**2. Outcome Type : Change in Action Outcome Measure**

**2012:50000                      2013:50000                      2014:50500                      2015:50500                      2016:51000**

**3. Associated Knowledge Area(s)**

- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 315 - Animal Welfare/Well-Being and Protection
- 402 - Engineering Systems and Equipment
- 601 - Economics of Agricultural Production and Farm Management



**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 5**

**1. Outcome Target**

Number of producers (or units represented) adopting energy efficient practices (energy conservation plans, more efficient equipment, etc.)

**2. Outcome Type : Change in Action Outcome Measure**

<b>2012:1</b>	<b>2013:1</b>	<b>2014:2</b>	<b>2015:2</b>	<b>2016:2</b>
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**3. Associated Knowledge Area(s)**

- 112 - Watershed Protection and Management
- 123 - Management and Sustainability of Forest Resources
- 133 - Pollution Prevention and Mitigation
- 216 - Integrated Pest Management Systems
- 402 - Engineering Systems and Equipment
- 403 - Waste Disposal, Recycling, and Reuse

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 6**

**1. Outcome Target**

Increase profitability for the food animal sector of the Ohio agricultural industry.

**2. Outcome Type : Change in Condition Outcome Measure**

<b>2012:100000</b>	<b>2013:100000</b>	<b>2014:150000</b>	<b>2015:150000</b>	<b>2016:200000</b>
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**3. Associated Knowledge Area(s)**

- 112 - Watershed Protection and Management
- 123 - Management and Sustainability of Forest Resources
- 133 - Pollution Prevention and Mitigation
- 205 - Plant Management Systems
- 216 - Integrated Pest Management Systems
- 307 - Animal Management Systems

- 308 - Improved Animal Products (Before Harvest)
- 315 - Animal Welfare/Well-Being and Protection
- 402 - Engineering Systems and Equipment
- 403 - Waste Disposal, Recycling, and Reuse
- 601 - Economics of Agricultural Production and Farm Management

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 7**

**1. Outcome Target**

Number of Schedule "F" tax forms filed by tax practitioners that participated in OSU Income Tax Schools.

**2. Outcome Type : Change in Condition Outcome Measure**

**2012:15000      2013:15000      2014:15000      2015:15000      2016:15000**

**3. Associated Knowledge Area(s)**

- 602 - Business Management, Finance, and Taxation
- 603 - Market Economics

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 8**

**1. Outcome Target**

Number of farms using transitioning planning.

**2. Outcome Type : Change in Action Outcome Measure**

**2012:150      2013:150      2014:175      2015:175      2016:175**

**3. Associated Knowledge Area(s)**

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

**4. Associated Institute Type(s)**

- 1862 Extension

**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

**Description**

{NO DATA ENTERED}

**V(K). Planned Program - Planned Evaluation Studies**

**Description of Planned Evaluation Studies**

{NO DATA ENTERED}

**V(A). Planned Program (Summary)**

**Program # 22**

**1. Name of the Planned Program**

Preparing Youth for Success (Extension)

**2. Brief summary about Planned Program**

As Ohio's economy continues the shift from an industrial to a knowledge base, its young people and volunteers supporting them need advanced skills to be successful. OSU Extension, through 4-H and other programming efforts, provides resources and support for volunteers who deliver educational programs focused on critical issues affecting youth. Educational programs foster a practical understanding and application of science, technology, engineering, math and other life skills that will lead to a more prepared young person pursuing a post-secondary education, entering the workforce, and becoming productive citizens of their communities.

**3. Program existence :** Intermediate (One to 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 :** No

**V(B). Program Knowledge Area(s)**

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
806	Youth Development	100%		0%	
	<b>Total</b>	100%		0%	

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

**1. Situation and priorities**

It is the mission of 4-H to empower youth to reach their full potential working and learning in partnership with caring adults. The Ohio 4-H program seeks to promote positive youth development, facilitate learning, and engage youth in educational programs in order to enhance their quality of life. There is opportunity to build human and social capital in individual neighborhoods and communities by creating sustained volunteer-led groups that promote youth contribution. The educational priorities are: (1) Science, Engineering and Technology tied to scientific learning and discovery; and (2) Citizenship tied to the activities of people with institutions, government and communities for the common good.

**2. Scope of the Program**

- In-State Extension

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

**1. Assumptions made for the Program**

1. Young people will need to be involved in meaningful learning experiences.
2. Research will continue to support Positive Youth Development Practices/Programming as the most effective way for reaching youth.
3. Demands on family time will continue to be a factor in the programs youth choose.
4. There will continue to be risk factors that influence youth and the need for programs that address those factors.
5. Youth will face in increasing amount of choices and opportunities in all facets of their lives

**2. Ultimate goal(s) of this Program**

Educational programs foster a practical understanding and application of science, technology, engineering, math and other life skills that will lead to a more prepared young person pursuing a post-secondary education, entering the workforce, and becoming productive citizens of their communities.

**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
2012	55.0	0.0	0.0	0.0
2013	55.0	0.0	0.0	0.0
2014	55.0	0.0	0.0	0.0
2015	55.0	0.0	0.0	0.0
2016	55.0	0.0	0.0	0.0

**V(F). Planned Program (Activity)**

**1. Activity for the Program**

- Conduct workshops
- Face to face and virtual meetings
- Develop curriculum
- Provide training to professionals, volunteers and youth
- Media and web site creations
- Partnering with businesses and other organizations

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

**Extension**

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> <li>● Education Class</li> <li>● Workshop</li> <li>● Group Discussion</li> <li>● One-on-One Intervention</li> <li>● Demonstrations</li> </ul>	<ul style="list-style-type: none"> <li>● Public Service Announcement</li> <li>● Newsletters</li> <li>● TV Media Programs</li> <li>● Web sites other than eXtension</li> <li>● Other 1 (Pod Casts)</li> <li>● Other 2 (Emerging Technology)</li> </ul>

**3. Description of targeted audience**

Youth - infant through 18 years of age

Parents of youth

Volunteers working with youth audiences

Teachers/Educators working with youth audiences

Youth (with a special focus on new and underserved audiences); Families; Volunteers; Youth Development Professional Staff; and Community Leaders involved in subject specific areas.

**V(G). Planned Program (Outputs)**

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
  - Direct Adult Contacts
  - Indirect Adult Contacts
  - Direct Youth Contacts
  - Indirect Youth Contact
- Number of patents submitted
- Number of peer reviewed publications

Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

## **V(H). State Defined Outputs**

### **1. Output Measure**

- Number of youth enrolled/engaged in organized community 4-H clubs
  - Number of youth enrolled/engaged in after school 4-H programs
  - Number of youth enrolled/ engaged in military 4-H clubs
  - Number of youth participating in Special Interest and short term programs
  - Number of youth participating in School Enrichment programs
  - Number of youth participating in 4-H overnight camping programs
  - Number of youth participating in 4-H day camping programs
  - Number of adult volunteers
  - Number of teen volunteers
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

**V(I). State Defined Outcome**

<b>O. No</b>	<b>Outcome Name</b>
1	Increase understanding of decision making processes
2	Increase knowledge in educational topic being presented
3	Demonstrate decision making and problem solving skills
4	Practice improved basic life skills
5	Youth who have participated in 4-H programs possess transferrable workforce skills



**Outcome # 1**

**1. Outcome Target**

Increase understanding of decision making processes

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:4800                  2013:4800                  2014:4800                  2015:5000                  2016:4800**

**3. Associated Knowledge Area(s)**

- 806 - Youth Development

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 2**

**1. Outcome Target**

Increase knowledge in educational topic being presented

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:6000                  2013:6000                  2014:6000                  2015:6000                  2016:6000**

**3. Associated Knowledge Area(s)**

- 806 - Youth Development

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 3**

**1. Outcome Target**

Demonstrate decision making and problem solving skills

**2. Outcome Type : Change in Action Outcome Measure**

**2012:4000      2013:4000      2014:4000      2015:4000      2016:4000**

**3. Associated Knowledge Area(s)**

- 806 - Youth Development

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 4**

**1. Outcome Target**

Practice improved basic life skills

**2. Outcome Type : Change in Action Outcome Measure**

**2012:3200      2013:3200      2014:3200      2015:3200      2016:3200**

**3. Associated Knowledge Area(s)**

- 806 - Youth Development

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 5**

**1. Outcome Target**

Youth who have participated in 4-H programs possess transferrable workforce skills

**2. Outcome Type : Change in Condition Outcome Measure**

**2012:3200      2013:3200      2014:3200      2015:3200      2016:3200**

**3. Associated Knowledge Area(s)**

- 806 - Youth Development

**4. Associated Institute Type(s)**

- 1862 Extension

**V(J). Planned Program (External Factors)**

**1. External Factors which may affect Outcomes**

- Economy
- Appropriations changes
- Competing Programmatic Challenges

**Description**

{NO DATA ENTERED}

**V(K). Planned Program - Planned Evaluation Studies**

**Description of Planned Evaluation Studies**

{NO DATA ENTERED}

**V(A). Planned Program (Summary)**

**Program # 23**

**1. Name of the Planned Program**

Strengthening Families & Communities (Extension)

**2. Brief summary about Planned Program**

Individuals and families face a wide range of challenges in their daily lives. OSU Extension research and programming will bring solutions to targeted statewide issues through Signature Programs and other offerings that transfer the latest creative and innovative thinking. Strengthening Families & Communities programming will focus on a full range of topics designed to teach people how to apply practical information to their daily lives in order to make informed choices about family financial management, healthy lifestyles, nutrition, and family relationships.

**3. Program existence :** Intermediate (One to five years)

**4. Program duration :** Medium Term (One to five years)

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

**6. Expending other than formula funds or state-matching funds :** No

**V(B). Program Knowledge Area(s)**

1. Program Knowledge Areas and Percentage

<b>KA Code</b>	<b>Knowledge Area</b>	<b>%1862 Extension</b>	<b>%1890 Extension</b>	<b>%1862 Research</b>	<b>%1890 Research</b>
607	Consumer Economics	10%		0%	
703	Nutrition Education and Behavior	20%		0%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	5%		0%	
723	Hazards to Human Health and Safety	10%		0%	
724	Healthy Lifestyle	20%		0%	
801	Individual and Family Resource Management	25%		0%	
802	Human Development and Family Well-Being	10%		0%	
	<b>Total</b>	100%		0%	

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

**1. Situation and priorities**

As determined through the use of statewide clientele surveys and focus groups, three key issues for residents of Ohio and the nation are economic stability, healthy lifestyles, and educational success. The nature of these complex key issues requires programming that is holistic and increasingly multidisciplinary.

Across the breadth of four interdisciplinary Impact Areas, OSU Extension will focus teaching and outreach programming to engage with stakeholders to address these critical issues. Based upon local success, we will replicate programming across the state to meet local needs and to advance the progress achieved in initial programming implementation. We will build upon our experience and success to further address the needs of Ohioans. OSU Extension will focus the skills and abilities of personnel in nine multi-county Extension Education and Research Areas to deliver the latest knowledge, while maintaining an emphasis on local programming needs. The research and educational technologies we support empower people and communities to solve problems and improve their lives. Specifically, Extension works to improve the quality of life for all Ohio citizens. Strengthening the lives and communities of Ohio through research-based educational programming (activities at the core of OSU Extension's mission) are keys to the long-term competitive sustainability of Ohio's high standard of living.

## **2. Scope of the Program**

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

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

### **1. Assumptions made for the Program**

OSU-Extension has a strong history of helping to identify and meet community needs. Our team of campus- and field-based faculty and staff work collaboratively to design and implement research-based, non-biased educational curricula and programming. We have several already developed programs that target a range of clientele. Each is tailored to meet the larger environmental and developmental needs of the target audience. Particular attention is given to ensuring that the program materials are immediately relevant, contextually grounded, and based on sound pedagogical theories. The Conceptual Programming Model (CPM) guides the development of our programming. The CPM specifies that organizational and social conditions be assessed to determine programming opportunities, focusing attention on the importance of understanding audience needs, delineating outcomes to be achieved, designing appropriate, audience-responsive learning activities to achieve those outcomes, and specifying evaluation methods to document impact. Further, it assumes that program planners will draw upon necessary principles and tenants from relevant theories (e.g., Behavioral, Cognitive, Affective, Communications, Human Development, Economic, Psychological, Social, etc). Social Learning and Stages of Change theories are also foundational to our program development. Many of our programs are developing or have developed evidence that they work to increase awareness, knowledge, skills and improve behavior, largely via quasi-experimental designs (e.g., pre/post testing).

### **2. Ultimate goal(s) of this Program**

Participants will apply practical information to their daily lives in order to make informed choices about family financial management, healthy lifestyles, nutrition, and family relationships resulting in reduced health care expenditures, financial security at all life stages, improved quality of life, and more resilient families and communities.

## **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
2012	20.0	0.0	0.0	0.0
2013	20.0	0.0	0.0	0.0
2014	20.0	0.0	0.0	0.0
2015	20.0	0.0	0.0	0.0
2016	20.0	0.0	0.0	0.0

**V(F). Planned Program (Activity)**

**1. Activity for the Program**

- conduct formal and informal needs assessments
- develop programming materials and curricula
- conduct meetings, workshops and educational sessions
- conduct program evaluation and applied research
- form and sustain community partnerships
- train volunteers, paraprofessionals, and other community agency/organization professionals

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

**Extension**

Direct Methods	Indirect Methods
<ul style="list-style-type: none"> <li>• Education Class</li> <li>• Workshop</li> <li>• Group Discussion</li> <li>• One-on-One Intervention</li> <li>• Demonstrations</li> </ul>	<ul style="list-style-type: none"> <li>• Public Service Announcement</li> <li>• Newsletters</li> <li>• Web sites other than eXtension</li> </ul>

**3. Description of targeted audience**

Strengthening Families and Communities programming is tailored to meet the needs of the intended audience. For example school programming is age appropriate whereas programs at Senior Centers are targeted to individuals living alone or with one other person in terms of food preparation. The end result is a program that has the potential to encompass all residents of the county. Below is a listing of the specific groups we intend to reach with targeted awareness, educational and skills-development programming:

- parents of children ages birth to 18, including, but not limited to: teen, step, adoptive, foster, single,

divorcing, incarcerated, fathers who may not have yet established paternity, and grandparents

- adults in, or thinking about entering, intimate relationships
- young adults
- older adults and those who care for them
- baby boomers, especially women
- limited resource families, including mothers with young children and food stamp recipients
- new employees
- bankruptcy filers
- debt burdened individuals and couples
- first time homebuyers
- individuals with diabetes and their caregivers/family support members
- food establishment managers and food service employees
- volunteer food preparers
- child care providers
- teachers
- social service professionals
- general consumers (other formal or informal education)

### **V(G). Planned Program (Outputs)**

NIFA no longer requires you to report target numbers for standard output measures in the Plan of Work. However, all institutions will report actual numbers for standard output measures in the Annual Report of Accomplishments and Results. The standard outputs for which you must continue to collect data are:

- Number of contacts
    - Direct Adult Contacts
    - Indirect Adult Contacts
    - Direct Youth Contacts
    - Indirect Youth Contact
  - Number of patents submitted
  - Number of peer reviewed publications
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.

### **V(H). State Defined Outputs**

#### **1. Output Measure**

- Educational sessions held with two or more participants
- Clicking this box affirms you will continue to collect data on these items and report the data in the Annual Report of Accomplishments and Results.



**V(I). State Defined Outcome**

O. No	Outcome Name
1	# of participants who increased knowledge on topic presented as a result of the education program/session(s)
2	# of participants who plan to adopt one or more recommended practices as a result of the education program/session(s)
3	# of participants who actually adopt one or more recommended practices as a result of this education program/session(s)

**Outcome # 1**

**1. Outcome Target**

# of participants who increased knowledge on topic presented as a result of the education program/session(s)

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:10000      2013:10000      2014:10000      2015:10000      2016:10000**

**3. Associated Knowledge Area(s)**

- 607 - Consumer Economics
- 703 - Nutrition Education and Behavior
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
- 723 - Hazards to Human Health and Safety
- 724 - Healthy Lifestyle
- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 2**

**1. Outcome Target**

# of participants who plan to adopt one or more recommended practices as a result of the education program/session(s)

**2. Outcome Type : Change in Knowledge Outcome Measure**

**2012:5000      2013:5000      2014:5000      2015:5000      2016:5000**

**3. Associated Knowledge Area(s)**

- 607 - Consumer Economics
- 703 - Nutrition Education and Behavior
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
- 723 - Hazards to Human Health and Safety
- 724 - Healthy Lifestyle
- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being

**4. Associated Institute Type(s)**

- 1862 Extension

**Outcome # 3**

**1. Outcome Target**

# of participants who actually adopt one or more recommended practices as a result of this education program/session(s)

**2. Outcome Type : Change in Action Outcome Measure**

**2012:2500                      2013:2500                      2014:2500                      2015:2500                      2016:2500**

**3. Associated Knowledge Area(s)**

- 607 - Consumer Economics
- 703 - Nutrition Education and Behavior
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
- 723 - Hazards to Human Health and Safety
- 724 - Healthy Lifestyle
- 801 - Individual and Family Resource Management
- 802 - Human Development and Family Well-Being

**4. Associated Institute Type(s)**

- 1862 Extension

**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**

{NO DATA ENTERED}

**V(K). Planned Program - Planned Evaluation Studies**

**Description of Planned Evaluation Studies**

{NO DATA ENTERED}