# 2008 University of Arizona Combined Research and Extension Plan of Work

## I. Plan Overview

### 1. Brief Summary about Plan Of Work

This is our first update on the current plan of work. New challenges in Agriculture and Life Science are clearly evident. Biofuels and other energy issues, a new farm bill, international trade issues, and climate change offer new research and extension challenges. Many challenges will help to shape the future of Arizona agriculture in the year 2008 and beyond. Over the next ten years, Arizona agriculture will be challenged by international competition, environmental regulation, changes in technologies and the food and fiber production chain, and increased risk. We expect both individual management decisions and actions by government, land grant colleges, and grass roots groups of agricultural producers to meet these challenges. Nevertheless, the direct, induced and ripple effects of Arizona Agriculture provide overall impact of of near 7 billion dollars.

Arizona farmers have been and continue to be early adopters of new technologies, including laser leveling, drip irrigation, transgenic cottons, insect growth regulators (IGRs), and others. Informed, innovative farm managers, as well as price and yield incentives, helped spur this early, widespread adoption. Thus progressive farm management attitude and practices already in place will help assure the use and diffusion of new technologies in the next decade.

Technology is currently available to address many natural resource problems. To minimize adverse impacts on soil and water resources, ranchers will continue to conduct rangeland monitoring and adjust their livestock grazing systems. Specific methods are being developed to demonstrate effectively the benefits of instituting environmentally sound natural resource management programs. The College of Agriculture and Life Sciences is becoming a leader in this arena. The social, environmental and economic benefits from these new practices need to be quantified and compared to the costs of not implementing these programs.

New developments in precision implements, communication, and computer technology promise to change some farming and ranching activities. For example, data from precision implements will be analyzed and shared through on-line tools, permitting improved interaction between farmers and various other players in the food and fiber production system. GPS and GIS will be an important part of precision farming. A new relationship with NASA will build on the GPS and GIS activities and its practical application at the local level. Agribusinesses will be more closely linked by these technologies and provide inputs tailored to individual field and feedlot needs.

Farms will continue to use more biotechnology, especially for managing pests. Bt and Roundup Ready cotton provide good examples of ways that biotechnology will help meet the challenge of long-run price declines and environmental challenges. For the last few years, the UA cotton management team has worked closely with growers in implementing the use of insect growth regulators and Bt cotton in their fields. Because of this program, there has been a 60% decline in pesticide spraying, resulting in a reduction of 1.6 million pounds of pesticides used. This has saved 142 million dollars and reduced damage by 11%.

Collective actions will also affect farming in the next decade, perhaps even more so than in the past. At the federal level, economic policies seem on track to foster low interest rates, a crucial factor for capital-intensive agriculture, and a growing economy. Higher incomes will encourage demand for value-added and specialty agricultural products. Research and extension activities at the federal and state levels will provide information to reduce producer risk. At off-campus locations, the College of Agriculture and Life Sciences will use new computer and communications-based technologies to increase and make scientific information more accessible to farm and agribusiness managers and employees.

Although it shows ups and downs, most of Arizona agriculture has prospered over the last ten to fifteen years by successfully meeting the challenges of declining real commodity prices, increasing input prices, serious pest problems, drought, and increasing government regulations. This capacity to meet challenges bodes well for the future.

We speculate that ten years from now Arizona agriculture will have about the same number of very large farms producing most of the state's agricultural production, the dairy sector will continue to expand, ranching may decline somewhat, and cropped acreage will be at about its present level, although the acreage of individual crops may change over the years. Native American agriculture will likely increase with the availability of affordable water. More noticeable changes will occur in production technologies, the degree of vertical integration, and increased interaction with the international market.

Our family and youth programs will also experience change. In this era of federal deregulation and block grants to states, Arizonans have both the opportunity and the responsibility to cope with the gap in children's health care coverage, the tragedies of child abuse and neglect, the struggles of parents without job skills. and chronic diseases such as obesity and diabetes There is clear evidence that community effort can help prevent teenagers from having babies, committing crimes, and dropping out of school. Healthier people are better able to contribute to a robust economy.

Fortunately, we have the tools we need to face these challenges. The risk indicators confirm that focused attention, money, and uninterrupted effort over time will produce good results. As a result of increased federal and state investment, more children now have access to quality preschool, and more parents are getting help in paying for child care.

Health issues remain a challenge.We have a long way to go to reach the point where every Arizona child has the opportunity to succeed. The rate of reports of child abuse and neglect needing investigation grew about 30% in the past 10 years. The rate of child deaths due to abuse or neglect nearly doubled during that time. And perhaps the most alarming statistic is the 25% jump in the percentage of Arizona children living in foster care. These are the most vulnerable children in our communities, growing up without the security of a stable family. The challenge of our program is to provide unique research-based university outreach efforts in partnership with local and state government as well as non-governmental organizations to address these crises conditions.

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

| Year | Extension | | Research | |
|---|---|---|---|---|
| | 1862 | 1890 | 1862 | 1890 |
| 2008 | 50.0 | 0.0 | 105.0 | 0.0 |
| 2009 | 50.0 | 0.0 | 105.0 | 0.0 |
| 2010 | 50.0 | 0.0 | 105.0 | 0.0 |
| 2011 | 50.0 | 0.0 | 105.0 | 0.0 |
| 2012 | 50.0 | 0.0 | 105.0 | 0.0 |

## II. Merit Review Process

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

- Internal University Panel
- Combined External and Internal University Panel

### 2. Brief Explanation

Merit review for Extension covers all programs conducted by CES.

## 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?

The following list outlines our priorities, as identified by stakeholders (496 stakeholders surveyed in spring 2006) and faculty (from state initiatives and working groups, 2003 – 2005).
ENSURE A SUSTAINABLE, PROFITABLE AND COMPETITIVE FOOD AND FIBER SYSTEM IN ARIZONA

Livestock production–Help livestock producers:
Prevent potential threats by developing an early warning system to detect 1) new emerging diseases, 2) the resurgence of well-known diseases, and 3) the introduction of foreign animal diseases into the United States.
Design management systems that fit an extensive range environment, including livestock production; genetics; nutrition; reproduction; economics; and grazing management.

Crop production–Help growers:
Increase water use efficiency in irrigated crops.
Use best management practices to enhance sustainable production of plants used for food, fiber, livestock feed, industrial products, and for environmental, aesthetic, recreational, conservation and ornamental purposes.

Urban horticulture-Help homeowners and landscape managers:
Increase water use efficiency in home and commercial landscapes.
Employ best management practices in the selection, installation, care and production of plants used for food, conservation, recreational and ornamental purposes.

ENHANCE NATURAL RESOURCE CONSERVATION AND MANAGEMENT
Increase public awareness and understanding of water quality and quantity, watershed values, riparian areas, climate science and geospatial tools.
Work with natural resource managers to improve management of rangeland and forest resources on a sustainable basis using best

management practices.

IMPROVE THE HEALTH, SAFETY AND ECONOMIC SECURITY OF ARIZONA INDIVIDUALS, FAMILIES AND COMMUNITIES
Provide training to help Arizona residents acquire the knowledge, skills, attitudes and behaviors necessary for self-sufficient, healthy lifestyles.
Equip youth and adults with work and life skills to help them acquire and keep jobs in today's workforce.

PREPARE ARIZONA YOUTH TO BE PRODUCTIVE CITIZENS, EQUIPPED WITH THE KNOWLEDGE, SKILLS AND ATTITUDES NEEDED FOR LIFE-LONG LEARNING AND A POSITIVE FUTURE
Engage youth as participants and decision-makers in programs, organizations, and communities of 4-H and beyond.
Promote the Arizona 4-H Youth Development program among diverse communities in Arizona.

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

The University of Arizona is an equal opportunity,affirmative action institution. The University does not discriminate on the basis or race, color, religion, sex, national origin, age, disability, veteran status or sexual orientation in its programs and activities. The University has special and specific initiatives to work with Hispanic and Native American populations.

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

Each program utilized a logic model in planning expected outcomes and evaluation. All faculty report yearly in APROP (Annual performance report on-line) results of planned programs. Many of these reports are used to develop impact statement for a variety of clientele and for CSREES. The College new 5 year plan describes the expected outcome and impacts of the six programs outlined in this Plan of Work. Within each program mutli-state and multi-institution issues are also addressed and encouraged. All state specialists have joint Extension and Research funding and expectations.
Being a border state with Mexico, California, New Mexico, Nevada, Utah, and Colorado, numerous multi-state programs exist through the collaborative efforts of faculty from each state. This type of collaboration improves effectiveness and responsiveness.

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

This plan will continue the long standing integration between research and extension with appropriate input from stakeholders.

## IV. Stakeholder Input

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

- Targeted invitation to traditional stakeholder individuals
- Survey of traditional stakeholder groups
- Targeted invitation to traditional stakeholder groups
- Survey of traditional stakeholder individuals
- Use of media to announce public meetings and listening sessions
- Targeted invitation to selected individuals from general public

**Brief explanation.**

Public input is extremely important to the College of Agriculture and Life Sciences. Because we are a Land Grant College committed to serving the needs of the State of Arizona, the College regularly seeks stakeholder input, programmatic feedback, and advice on future directions from citizens.

**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
- Open Listening Sessions
- Needs Assessments

- Use Internal Focus Groups
- Use External Focus Groups

**Brief explanation.**

1) Advisory Boards
a) Cooperative Extension.
The Legislature of the State of Arizona accepted the provisions of the Smith-Lever Act in 1915. It authorized the Board of Regents of the University of Arizona, the Land Grant University in Arizona, to "organize and conduct agricultural Extension work which shall be carried on in connection with the College of Agriculture and Life Sciences of the UA in accordance with the terms and conditions expressed in the Act of Congress aforesaid". This State legislation also empowered county governments to appropriate funds for the county Extension program. Currently, according to Arizona State Law ARS 3-124-127, each County Extension Board consists of seven persons, who are residents of the county, four of whom have as their principal business the production of agricultural commodities, and the other three of whom are representative of organizations or persons who utilize the county Cooperative Extension offices. Extension faculty are sensitive to including membership representative of their county regardless of racial or ethnic background. Names of Advisory Boards for each Arizona county are available at the Cooperative Extension web site (http://ag.arizona.edu/extension/).
The County Extension Boards have three responsibilities. First, in order to build educational program priorities that are based on needs of local people, the Extension Board must approve the Annual County Plan of Work. The county Extension faculty present a prioritized list of potential programs and the Board may suggest others. In setting priorities, Cooperative Extension is interested in involving a broad-based, representative county group that may include commodity groups, 4-H councils, family consumer groups and community development groups.
Another role of the County Extension Board is to annually approve the county Extension budget, submitted to the Extension Board by the County Director. This budget covers all funds expended for Extension work in the county. According to the legislation, the Board of Supervisors of each county must provide reasonable rent-free office space for the conduct of extension work in that county.
Finally, the Extension Board approves the Annual Report of Extension work in the county. County reports are available at the Cooperative Extension web site.

b) Experiment Station
Individual advisory boards have been established for each of the following Agricultural Centers: Maricopa and Citrus, Safford, Yuma, Oracle, Santa Rita Experimental Range and the V-V Ranch. The boards have representatives from the agricultural community, the agri-business community and include consumer representatives who are appointed on a rotational basis. These boards meet from two to four times per year to review ongoing programs and make recommendations for change. In addition, the State 4-H Youth Development program, the Departments of Agricultural and Biosystems Engineering and Animal Science and the Schools of Renewable Natural Resources and Family and Consumer Studies have separate advisory committees that provide input to the programs of these units.
2) State Program Evaluation
Accountability is increasingly important to secure new resources, maintain visibility, and market effectiveness. Every faculty member in the College of Agriculture and Life Sciences provides an Annual Performance Report (APR) of accomplishments and impacts for the previous year, and a plan of major commitments for the coming year. As of February 1, 2001, faculty prepare their APRs on-line, in a new system called APROL.
Since the year 2004, the College of Agriculture and Life Sciences has a searchable database of programs and their impacts. Key components of the database are: (1) college-wide reporting, linking extension, research and teaching; (2) agricultural experiment station reporting of federal project data; (3) Cooperative Extension reporting of federal clientele contact data and outreach activities.
In the past year, Cooperative Extension sponsored several program reviews-- V-V Ranch (Agricultural Center), Family and Consumer Sciences, Horticulture, Natural Resources and Integrated Pest Management as well as several county reviews for 4-H Youth Development. Statewide program priorities for the next three to five years were identified during these exercises. Extension faculty are committed to an on-going process of self-improvement in outreach programs.

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

**Brief explanation**

1) Advisory Boards
CALS uses a variety of means to solicit stakeholder input (surveys, forums, listening sessions, advisory groups). As noted earlier, structured advisory meetings with both traditional and non-traditional stakeholders are held quarterly in most counties and at the Agricultural Centers. Faculty also utilize a variety of methods (needs assessments, evaluation surveys, group discussions) to gather input which is used in providing direction and evaluation in both research and extension programs.

**3. A statement of how the input will be considered**

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

**Brief explanation.**

Stakeholder input is used by both CES and AES for determination of priorities and establishment of programs.

# V. Planned Program Table of Content

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

**1. Name of the Planned Program**

ANIMAL SCIENCES

**2. Brief summary about Planned Program**

Animal agriculture represents a significant component of farm gate sales in Arizona. Ensuring that animal agriculture remains profitable and sustainable in a public lands state is a challenge, particularly for beef cattle producers. It is incumbent on the Land Grant University to assist in the development of sustainable production systems that are compatible with arid environments and public lands grazing policies. Livestock operations located in very hot environments and adjacent to a foreign border have unique situations with respect to stress from both the environment and prevalence of disease.

**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**

- 301 4% Reproductive Performance of Animals
- 302 17% Nutrient Utilization in Animals
- 305 21% Animal Physiological Processes
- 306 8% Environmental Stress in Animals
- 311 50% Animal Diseases

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

**1. Situation and priorities**

Market conditions, limited rainfall, extensive grazing situations, poisonous plants and a constant threat from cross-border diseases continue to provide challenges for cattle producers in Arizona. Dairy production is in a growth phase in Arizona primarily by significant growth in size of existing dairies as opposed to increases in the number of dairies. Very large dairies create a unique set of production related problems that need to be addressed.

**2. Scope of the Program**

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

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

**1. Assumptions made for the Program**

Both dairy and beef production enterprises will continue to be important components of Arizona agriculture. Horses will always be present and there will be limited sheep production.

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

Develop new and more appropriate production systems to assure profitability and sustainability of production for those who have beef and dairy enterprises in Arizona. Gain a better understanding of basic animal genetics and genomics and in particular gain an understanding of

molecular mechanisms that allow animals to adapt to harsh environments. Reach a better understanding of the mechanisms of disease in livestock and derive products and procedures to control disease.

## 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 |
| 2008 | 2.0 | 0.0 | 22.0 | 0.0 |
| 2009 | 2.0 | 0.0 | 22.0 | 0.0 |
| 2010 | 2.0 | 0.0 | 22.0 | 0.0 |
| 2011 | 2.0 | 0.0 | 22.0 | 0.0 |
| 2012 | 2.0 | 0.0 | 22.0 | 0.0 |

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

### 1. Activity for the Program

Develop innovative new methods to fight animal diseases.
Develop improved livestock through genetics and molecular biology

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

| Extension | |
|---|---|
| Direct Methods | Indirect Methods |
| • Workshop<br>• One-on-One Intervention<br>• Demonstrations<br>• Group Discussion<br>• Education Class | • Public Service Announcement<br>• Newsletters<br>• Web sites |

### 3. Description of targeted audience

Commodity groups, state agencies, producers, youth.

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

### 1. Standard output measures

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

| | Direct Contacts Adults | Indirect Contacts Adults | Direct Contacts Youth | Indirect Contacts Youth |
|---|---|---|---|---|
| Year | Target | Target | Target | Target |
| 2008 | 300 | 100 | 1500 | 200 |
| 2009 | 300 | 100 | 1500 | 200 |
| 2010 | 300 | 100 | 1500 | 200 |
| 2011 | 300 | 100 | 1500 | 200 |
| 2012 | 300 | 100 | 1500 | 200 |

**2. (Standard Research Target) Number of Patents**

**Expected Patents**

**2008 :** 1 **2009 :** 1 **2010 :** 2 **2011 :** 0 **2012 :** 1

**3. Expected Peer Review Publications**

| Year | Research Target | Extension Target |
|---|---|---|
| 2008 | 0 | 0 |
| 2009 | 0 | 0 |
| 2010 | 0 | 0 |
| 2011 | 0 | 0 |
| 2012 | 0 | 0 |

## V(H). State Defined Outputs

**1. Output Target**

- Effectiveness of the research program will be based on publications, external grant support, and integration into existing extension programs

  **2008 :** 22 **2009 :** 22 **2010 :** 22 **2011 :** 22 **2012 :** 22

- Create awareness and increase knowledge

  **2008 :** 1000 **2009 :** 1000 **2010 :** 1000 **2011 :** 1000 **2012 :** 1000

- Expand participation in our Annual Cow College program

  **2008 :** 100 **2009 :** 100 **2010 :** 100 **2011 :** 100 **2012 :** 100

## V(I). State Defined Outcome

**1. Outcome Target**

Number of farmers adopting more sustainable and profitable large scale dairy production practices

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

**2008 :** 20 **2009 :** 20 **2010 :** 20 **2011 :** 20 **2012 :** 20

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

- 301 - Reproductive Performance of Animals

- 302 - Nutrient Utilization in Animals
- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 311 - Animal Diseases

**1. Outcome Target**

Adoption of more profitable breeds of beef cattle for arid land conditions

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

**2008 :**50 **2009 :** 50 **2010 :** 50 **2011 :**50 **2012 :** 50

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

- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 311 - Animal Diseases

## V(J). Planned Program (External Factors)

**1. External Factors which may affect Outcomes**

- Appropriations changes
- Economy
- Public Policy changes
- Government Regulations
- Natural Disasters (drought,weather extremes,etc.)

**Description**

{NO DATA ENTERED}

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

**1. Evaluation Studies Planned**

- After Only (post program)

**Description**

{NO DATA ENTERED}

**2. Data Collection Methods**

- {NO DATA ENTERED}

**Description**

{NO DATA ENTERED}

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

### 1. Name of the Planned Program

ENVIRONMENT, WATER, LAND AND NATURAL RESOURCES

### 2. Brief summary about Planned Program

The consequences of broader land use activities that are known to contribute to water quality and degradation challenge decision makers in the arid Southwest. Energy and water efficient landscaping (Xeriscape) demonstrates how to create beautiful and efficient environments compatible with the desert communities. Science and data management provide inputs, such as the AZMET automated weather stations in Arizona where collected data is made available to turf grass managers, cotton and vegetable farmers, park managers and specialized agricultural producers. Programs are planned around xeriscaping, nonpoint pollution, drought related strategies, climate science, rangeland monitoring, watershed management, the consequences of pathogen detection, and related outreach educational programs. Growers in the arid Southwest manage water, fertilizer applications and nutrient relationships. With over one million acres of irrigated cropland in Arizona, with crops ranging from citrus, and lettuce, to pecans and apples, measuring water and nutrient relationships is a critical part of any management system. Programs are planned for irrigation studies, wastewater management, contamination, nutrient management, hydroponics, sustainability and environmental impacts.

**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

- 102 37% Soil, Plant, Water, Nutrient Relationships
- 111 16% Conservation and Efficient Use of Water
- 112 16% Watershed Protection and Management
- 121 31% Management of Range Resources

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

### 1. Situation and priorities

The demand for water, especially from the municipal and industrial sectors, continues to increase.Agriculture remains as a significant economic contributor to the state. Sustainability entails management challenges for the efficient and effective use of scarce water resources including the use of grey water. The amount of water going into agriculture will be reduced slightly each decade. The consequences of a prolonged drought will effect farms, ranches, tribes, metropolitan areas and wildlife. Arizona is growing and developing in leaps and bounds with major building projects appearing in every community. Farmers are planting more houses than pecans. Water professionals in the state continue to discuss the challenges of watershed issues, assuring long-term water supplies and meeting water management objectives, whether statutory or otherwise. The competition for water supplies could be fierce among different regions of the state, between agriculture and the metropolitan areas, between tribes and other entities in the state. Both demand and supply side solutions need study. Programs are planned around the use of tribal water, water brokering, conservation, onsite wastewater demonstrations, installation and maintenance of septic systems, water audits, water education for teachers, and master watershed programs.

### 2. Scope of the Program

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

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

### 1. Assumptions made for the Program

Demand for water use will increase with population growth and tribal needs. Everyone wants others to use less water and enhance their

water usage. Tribal water rights are changing access to water. The State of Arizona water law continues to drive policy decisions. Population growth is transforming the landscape. Controlled environment agriculture (greenhouse production) will continue to expand.

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

Develop programs that reduce usage, conserve, and maximize the use of water. Create better management systems, improve early detection of contaminants, use precision technology to reduce water usage and improve water quality. Provide the best science, environmental data, and legal precedent to find compromise in water policy and management.

## 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 |
| 2008 | 11.0 | 0.0 | 21.0 | 0.0 |
| 2009 | 11.0 | 0.0 | 21.0 | 0.0 |
| 2010 | 11.0 | 0.0 | 21.0 | 0.0 |
| 2011 | 11.0 | 0.0 | 21.0 | 0.0 |
| 2012 | 11.0 | 0.0 | 21.0 | 0.0 |

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

**1. Activity for the Program**

Extension specialists and their clients need expanded knowledge about water quality and quantity to help protect the environment and safeguard our food supply.

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

| Extension | |
|---|---|
| Direct Methods | Indirect Methods |
| • Workshop<br>• Education Class<br>• One-on-One Intervention<br>• Demonstrations<br>• Group Discussion | • TV Media Programs<br>• Public Service Announcement<br>• Web sites<br>• Newsletters |

**3. Description of targeted audience**

Natural resouce managers, Governor's Office and state agencies, municipal organizations and leaders, households, consumers, youth, master gardening and master watershed programs

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

**1. Standard output measures**

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

| | Direct Contacts Adults | Indirect Contacts Adults | Direct Contacts Youth | Indirect Contacts Youth |
|---|---|---|---|---|
| Year | Target | Target | Target | Target |
| 2008 | 15000 | 20000 | 6000 | 500 |
| 2009 | 15000 | 20000 | 6000 | 500 |
| 2010 | 15000 | 20000 | 6000 | 500 |
| 2011 | 15000 | 20000 | 6000 | 500 |
| 2012 | 15000 | 20000 | 6000 | 500 |

**2. (Standard Research Target) Number of Patents**

**Expected Patents**

**2008 :** 1 **2009 :** 1 **2010 :** 1 **2011 :** 1 **2012 :** 1

**3. Expected Peer Review Publications**

| Year | Research Target | Extension Target |
|---|---|---|
| 2008 | 0 | 0 |
| 2009 | 0 | 0 |
| 2010 | 0 | 0 |
| 2011 | 0 | 0 |
| 2012 | 0 | 0 |

## V(H). State Defined Outputs

**1. Output Target**

- Effectiveness of the research program will be used to reach direct and indirect contacts

  **2008 :** 2 **2009 :** 2 **2010 :** 3 **2011 :** 3 **2012 :** 3

- Number of individuals participating in educational programs

  **2008 :** 15000 **2009 :** 15000 **2010 :** 15000 **2011 :** 15000 **2012 :** 15000

- Number of individuals adopting new technology

  **2008 :** 1000 **2009 :** 1000 **2010 :** 1000 **2011 :** 1000 **2012 :** 1000

## V(I). State Defined Outcome

**1. Outcome Target**

Effectiveness of research programs will be based on publications, external grant support, and integration into existing extension programs

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

**2008 :** 35 **2009 :** 35 **2010 :** 35 **2011 :** 35 **2012 :** 35

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

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 121 - Management of Range Resources

**1. Outcome Target**

Number of individuals gaining knowledge by participating in educational programs

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

| **2008 :** | **2009 :** | **2010 :** | **2011 :** | **2012 :** |
|---|---|---|---|---|
| 10000 | 10000 | 10000 | 10000 | 10000 |

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

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 121 - Management of Range Resources

**1. Outcome Target**

Volunteers completing Master Gardening training

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

| **2008 :** | **2009 :** | **2010 :** | **2011 :** | **2012 :** |
|---|---|---|---|---|
| 350 | 350 | 350 | 350 | 350 |

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

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 121 - Management of Range Resources

**1. Outcome Target**

Create awareness and increase knowledge

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

| **2008 :** | **2009 :** | **2010 :** | **2011 :** | **2012 :** |
|---|---|---|---|---|
| 8000 | 8000 | 8000 | 8000 | 8000 |

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

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 121 - Management of Range Resources

## V(J). Planned Program (External Factors)

**1. External Factors which may affect Outcomes**

- Government Regulations
- Appropriations changes
- Natural Disasters (drought,weather extremes,etc.)
- Competing Public priorities
- Public Policy changes
- Economy

**Description**

Available resources will be the largest factor affecting outcomes followed by climate.

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

### 1. Evaluation Studies Planned

- After Only (post program)

**Description**

N/A

### 2. Data Collection Methods

- {NO DATA ENTERED}

**Description**

{NO DATA ENTERED}

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

**1. Name of the Planned Program**

FAMILY, YOUTH, AND COMMUNITY

**2. Brief summary about Planned Program**

Our outreach efforts build on the research base from our School of Family and Consumer Sciences and related departments, to address family and human development, cognitive (early brain) development, child care, dependent care, parenting and after school programs. The plan of work addresses the economic, social, psychological and biological factors affecting individuals, families and groups over their lifespan. 4H youth development is the prime youth program with direct access to technological advances in agriculture, life sciences, human development, social sciences and related areas which result from land-grant university research. Youth development is helping young people become mature, competent adults capable of participation and leadership in their communities with valuable skills on entry into the workforce.

**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**

- 802 40% Human Development and Family Well-Being
- 806 60% Youth Development

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

**1. Situation and priorities**

Arizona's population is both aging (the first baby boomers turn 65 in 2011) and growing in numbers of youth. The fastest growing segment is the Hispanic population and the ages of most people moving into Arizona are the 20th and 30s (and their children). Events and trends in California greatly influence the population of Arizona. In addition, the influx of population from and through the Mexican border influence family, community and individual needs. High incidence of High School drop out rate (rated 49th in US), new immigrants, low income families, and limited after school literacy programs challenge traditional approaches. Programs are designed to link educational and community resources to improve family well-being.

**2. Scope of the Program**

- In-State Extension
- Multistate Research
- Multistate Extension
- In-State Research

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

**1. Assumptions made for the Program**

Increased rapid growth of a diverse population with diverse needs will continue. In addition, the rapid growth of disadvantaged populations both existing (especially certain Native American Tribes) and recent immigrantswill challenge our research capacities to deliver relevant programs sensitive to population needs.

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

To develop and provide research-based programs that address the evolving social challenges in our communities. These include educational programs such as financial literacy, training child care providers on early brain development, and helping youth learn problem-solving skills. This will result in life skills and leadership for individuals, families and the community

## 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 |
| 2008 | 24.0 | 0.0 | 5.0 | 0.0 |
| 2009 | 23.0 | 0.0 | 5.0 | 0.0 |
| 2010 | 22.0 | 0.0 | 5.0 | 0.0 |
| 2011 | 22.0 | 0.0 | 5.0 | 0.0 |
| 2012 | 22.0 | 0.0 | 5.0 | 0.0 |

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

### 1. Activity for the Program

Conduct research and deliver services, products and information

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

| Extension | |
|---|---|
| Direct Methods | Indirect Methods |
| • One-on-One Intervention<br>• Workshop<br>• Group Discussion<br>• Education Class | • Newsletters<br>• Web sites<br>• Public Service Announcement |

### 3. Description of targeted audience

Parents, educators, youth, community groups

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

### 1. Standard output measures

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

| | Direct Contacts Adults | Indirect Contacts Adults | Direct Contacts Youth | Indirect Contacts Youth |
|---|---|---|---|---|
| Year | Target | Target | Target | Target |
| 2008 | 6500 | 100000 | 70000 | 45000 |
| 2009 | 6500 | 100000 | 70000 | 45000 |
| 2010 | 6500 | 100000 | 70000 | 45000 |
| 2011 | 6500 | 100000 | 70000 | 45000 |
| 2012 | 6500 | 100000 | 70000 | 45000 |

### 2. (Standard Research Target) Number of Patents

**Expected Patents**

**2008 :**0 **2009 :**0 **2010 :** 0 **2011 :**0 **2012 :**0

**3. Expected Peer Review Publications**

| Year | Research Target | Extension Target |
|---|---|---|
| 2008 | 0 | 0 |
| 2009 | 0 | 0 |
| 2010 | 0 | 0 |
| 2011 | 0 | 0 |
| 2012 | 0 | 0 |

## V(H). State Defined Outputs

**1. Output Target**

- Number of individuals participating in educational programs

**2008 :**70000 **2009 :**70000 **2010 :** 70000 **2011 :**70000 **2012 :**70000

- Number of educational events, training workshops and clinics

**2008 :**215 **2009 :**215 **2010 :** 215 **2011 :**215 **2012 :**215

## V(I). State Defined Outcome

**1. Outcome Target**

Adoption of essential life skills by Arizona's youth that leads to a responsible, productive, and healthy life-style

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

**2008 :**7000 **2009 :** 7000 **2010 :** 7000 **2011 :**7000 **2012 :** 7000

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

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

**1. Outcome Target**

Adoption of life building skills including self-discipline, responsibility and leadership

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

**2008 :**14000 **2009 :** 14000 **2010 :** 14000 **2011 :**14000 **2012 :** 14000

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

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

## V(J). Planned Program (External Factors)

**1. External Factors which may affect Outcomes**

- Government Regulations
- Appropriations changes
- Public Policy changes
- Economy

**Description**

{NO DATA ENTERED}

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

### 1. Evaluation Studies Planned

- After Only (post program)

**Description**

{NO DATA ENTERED}

### 2. Data Collection Methods

- {NO DATA ENTERED}

**Description**

{NO DATA ENTERED}

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

**1. Name of the Planned Program**

HUMAN NUTRITION, HEALTH AND FOOD SAFETY

**2. Brief summary about Planned Program**

These programs focus on the relationships of the life sciences to human health promotion, disease prevention and food safety. Programs will use innovative interdisciplinary approaches to discovering, translating, and applying how nutrition and physical activity can prevent disease and promote good health and well-being. The safety and quality of food for human consumption is addressed by programs directed towards transportation, processing and consumer handling of food. Programs will encompass a broad range of approaches from basic cellular and molecular research to clinical human research studies and education programs.

**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**

- 702 33% Requirements and Function of Nutrients and Other Food Components
- 703 34% Nutrition Education and Behavior
- 712 33% Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occuring Toxins

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

**1. Situation and priorities**

Researchers estimate that one out of every two woman over 50 and one in five older men will suffer from a fracture related to osteoporosis or a loss of bone mass that leads to a weakened skeletal support structure. The Arizona Department of Health Services lists diabetes as the seventh leading cause of death in the state. The Center for Disease Control and Prevention estimates that food borne diseases cause approximately 76 million illnesses, 325,000 hospitalizations and 5,000 deaths annually in the United States. Arizona is ranked 4th in the nation for homes where grandparents provide the sole support of their grandchildren. These physical, economic, and cultural conditions challenge both extension and research agendas.

**2. Scope of the Program**

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

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

**1. Assumptions made for the Program**

Obesity, diabetes, osteoporosis and related chronic illness will increase especially in certain Arizona populations (e.g. Hispanic and Native American). Food access, quality, and safety will continue to be a challenge especially for low income audiences but for the population as a whole.

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

To foster innovative research and translate new discoveries into culturally-appropriate and effective individual and community programs for improving the health and well-being of people. To lead the way in advancing the understanding of the long term affects of physical activity and nutrition practices on health promotion and disease prevention. To continue to develop state-of-the-art exercise and nutrition research and education programs and evaluate the impact of these programs on health and wellness in diverse populations.

## 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 |
| 2008 | 9.0 | 0.0 | 9.0 | 0.0 |
| 2009 | 9.0 | 0.0 | 9.0 | 0.0 |
| 2010 | 9.0 | 0.0 | 9.0 | 0.0 |
| 2011 | 9.0 | 0.0 | 9.0 | 0.0 |
| 2012 | 9.0 | 0.0 | 9.0 | 0.0 |

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

### 1. Activity for the Program

Conduct research, conduct workshops, meetings, deliver services and information

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

| Extension | |
|---|---|
| Direct Methods | Indirect Methods |
| • Demonstrations<br>• Workshop<br>• Education Class | • Web sites<br>• Public Service Announcement<br>• Newsletters |

### 3. Description of targeted audience

General public, educators, health professionals, extension educators

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

### 1. Standard output measures

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

| | Direct Contacts Adults | Indirect Contacts Adults | Direct Contacts Youth | Indirect Contacts Youth |
|---|---|---|---|---|
| Year | Target | Target | Target | Target |
| 2008 | 25000 | 25000 | 600 | 20000 |
| 2009 | 25000 | 25000 | 600 | 20000 |
| 2010 | 25000 | 25000 | 600 | 20000 |
| 2011 | 25000 | 25000 | 600 | 20000 |
| 2012 | 25000 | 25000 | 600 | 20000 |

### 2. (Standard Research Target) Number of Patents

**Expected Patents**

**2008 :**0 **2009 :**1 **2010 :** 1 **2011 :**1 **2012 :**1

**3. Expected Peer Review Publications**

| Year | Research Target | Extension Target |
|---|---|---|
| 2008 | 0 | 0 |
| 2009 | 0 | 0 |
| 2010 | 0 | 0 |
| 2011 | 0 | 0 |
| 2012 | 0 | 0 |

## V(H). State Defined Outputs

**1. Output Target**

- Effectiveness of the research program will be based on publications, external grant support, and integration into existing extension programs

**2008 :**0 **2009 :**0 **2010 :** 0 **2011 :**0 **2012 :**0

## V(I). State Defined Outcome

**1. Outcome Target**

Create awareness and increase knowledge

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

**2008 :**2000 **2009 :** 2000 **2010 :** 2000 **2011 :**2000 **2012 :** 2000

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

- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occuring Toxins

**1. Outcome Target**

Number of individuals adopting recommendations for nutrition and health

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

**2008 :**5000 **2009 :** 5000 **2010 :** 5000 **2011 :**5000 **2012 :** 5000

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

- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occuring Toxins

## V(J). Planned Program (External Factors)

**1. External Factors which may affect Outcomes**

- Economy
- Public Policy changes
- Government Regulations
- Appropriations changes

**Description**

Lack of money will be the major driver

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

### 1. Evaluation Studies Planned

- After Only (post program)

**Description**

{NO DATA ENTERED}

### 2. Data Collection Methods

- {NO DATA ENTERED}

**Description**

{NO DATA ENTERED}

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

**1. Name of the Planned Program**

MARKETING TRADE AND ECONOMICS

**2. Brief summary about Planned Program**

The plan of work deals with economic analysis and the resource allocation processes of businesses and or consumers in the global marketplace. It also deals with the strategic analysis of the environments in which marketers and retailers operate to create successful management strategies and tactics in the global, value-added chain for food, fiber, services and other consumer goods. The results of these efforts will impact on economic development, on the marketplace and the communities, on global trade and on natural resources and the environment.

**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**

- 605 60% Natural Resource and Environmental Economics
- 610 40% Domestic Policy Analysis

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

**1. Situation and priorities**

Each year hundreds of U. S. asgricultural and rural businesses fail. Some of these failures are caused by poor financial management. Successful marketing, getting products from producers to domestic and international consumers, is a complex chain of activities that is crucial the economic survival for farms, agribusiness, and smallbusinesses. Additionally, more that half of such enterprises lack the information technology skills need to compete in the global marketplace.

**2. Scope of the Program**

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

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

**1. Assumptions made for the Program**

Increasing information technology, community development and marketing skills can improve the profitability and sustainability of Arizona agriculture and agribusiness ventures and the health of rural communities.

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

Producers as well as rural communities will benefit through an increased awareness of food security and animal and land management practices, risk management alternative, and technological innovations to compete in the global marketplace

## 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 |
| 2008 | 1.0 | 0.0 | 4.0 | 0.0 |
| 2009 | 1.0 | 0.0 | 4.0 | 0.0 |
| 2010 | 1.0 | 0.0 | 4.0 | 0.0 |
| 2011 | 1.0 | 0.0 | 4.0 | 0.0 |
| 2012 | 1.0 | 0.0 | 4.0 | 0.0 |

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

### 1. Activity for the Program

Effectiveness of the research program will be based on publications, external grant support and integration into extension programs

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

| Extension | |
|---|---|
| Direct Methods | Indirect Methods |
| • Workshop<br>• Education Class<br>• Group Discussion<br>• One-on-One Intervention | • Newsletters<br>• Public Service Announcement<br>• Web sites |

### 3. Description of targeted audience

Commodity groups, state agencies, financial institutions, producers, marketing organizations.

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

### 1. Standard output measures

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

| | Direct Contacts Adults | Indirect Contacts Adults | Direct Contacts Youth | Indirect Contacts Youth |
|---|---|---|---|---|
| Year | Target | Target | Target | Target |
| 2008 | 200 | 300 | 0 | 0 |
| 2009 | 200 | 300 | 0 | 0 |
| 2010 | 200 | 300 | 0 | 0 |
| 2011 | 200 | 300 | 0 | 0 |
| 2012 | 200 | 300 | 0 | 0 |

### 2. (Standard Research Target) Number of Patents

**Expected Patents**

**2008 :**0 **2009 :**1 **2010 :**0 **2011 :**1 **2012 :**1

### 3. Expected Peer Review Publications

| Year | Research Target | Extension Target |
|---|---|---|
| 2008 | 0 | 0 |
| 2009 | 0 | 0 |
| 2010 | 0 | 0 |
| 2011 | 0 | 0 |
| 2012 | 0 | 0 |

## V(H). State Defined Outputs

### 1. Output Target

- Develop improved marketing and economic models.

**2008 :**0 **2009 :**1 **2010 :** 0 **2011 :**1 **2012 :**1

## V(I). State Defined Outcome

### 1. Outcome Target

Increased financial stability of Arizona's producers

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

**2008 :**500 **2009 :** 500 **2010 :** 500 **2011 :**500 **2012 :** 500

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

- 605 - Natural Resource and Environmental Economics
- 610 - Domestic Policy Analysis

### 1. Outcome Target

Number of individuals gaining knowledge byparticipating in educational programs

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

**2008 :**200 **2009 :** 200 **2010 :** 200 **2011 :**200 **2012 :** 200

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

- 605 - Natural Resource and Environmental Economics
- 610 - Domestic Policy Analysis

### 1. Outcome Target

Adoption of management practices that assure a safe food supply

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

**2008 :**200 **2009 :** 200 **2010 :** 200 **2011 :**200 **2012 :** 200

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

- 605 - Natural Resource and Environmental Economics
- 610 - Domestic Policy Analysis

## V(J). Planned Program (External Factors)

### 1. External Factors which may affect Outcomes

- Public Policy changes
- Appropriations changes
- Economy

**Description**

Major perturbations of the economy of the import/export market could have a significant affect.

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

### 1. Evaluation Studies Planned

- After Only (post program)

**Description**

{NO DATA ENTERED}

### 2. Data Collection Methods

- {NO DATA ENTERED}

**Description**

{NO DATA ENTERED}

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

**1. Name of the Planned Program**

PLANT SCIENCES

**2. Brief summary about Planned Program**

Arizona has farm gate sales of nearly $3.4 billion and approximately 55% of the total comes from the sales of crops and crop products. Agriculture is diverse in Arizona because of its wide spectrum of climate and terrain. Temperatures range from very cold in the higher mountain areas to searing heat in the desert. Cropping in Arizona requires plants that are resistant to extremes in temperature and also tolerant to high salt situations which are prevalent throughout much of the state. Virtually all crops in Arizona are irrigated which places an added level of management on all cropping systems. The lack of sustained freezing temperatures in the main cropping areas of the state leads to unique problems with insects that have detrimental effects on plants. There is continuing need for research leading to the development of land, water, plant and insect management systems which insure the profitability and sustainability of arid land cropping enterprises while maintaining the quality of ground and surface waters. There will be continuing need for research leading to the development of a better understanding of basic plant genetics and genomics including an elucidation of the interactions among the physical, chemical, and biological mechanisms controlling the production of crops, as well as the degradation of water and soil resources at the source-area, farm, and watershed scales.

**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**

- 201 22% Plant Genome, Genetics, and Genetic Mechanisms
- 205 15% Plant Management Systems
- 206 15% Basic Plant Biology
- 211 19% Insects, Mites, and Other Arthropods Affecting Plants
- 212 19% Pathogens and Nematodes Affecting Plants
- 215 10% Biological Control of Pests Affecting Plants

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

**1. Situation and priorities**

Cotton has been “king” among crops in Arizona for many years. Unfortunately, international competition, low prices, the high cost of irrigation water and the probability of losing the current commodity program all are drivers in a steady decline of cotton production in the state. Better cropping and management systems are needed for those who are still growing cotton and new cropping systems need to be developed for alternative crops that are being developed, tested and adopted. Disease and insect problems are ever present.

**2. Scope of the Program**

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

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

### 1. Assumptions made for the Program

Economics and changes in the global economy will require that all forms of plant production in Arizona will have to become more efficient. Cotton production will continue to decline. Vegetables, forages and alternative crops will become more prevalent. New crops will require considerable effort for all aspects of management including identification of appropriate crop varieties and irrigation scheduling, fertilizer requirements, and insect and disease control.

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

Develop new and more appropriate production systems to assure profitability and sustainability of production for those who continue to grow cotton, vegetables, citrus, forages, small grains, and for the new and alternative crops that are adopted and adapted. Gain a better understanding of basic plant genetics and genomics including an elucidation of the interactions among the physical, chemical, and biological mechanisms controlling the production of crops. Develop cost effective means for controlling plant diseases and insect damage.

## 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 |
| 2008 | 8.0 | 0.0 | 36.0 | 0.0 |
| 2009 | 8.0 | 0.0 | 36.0 | 0.0 |
| 2010 | 8.0 | 0.0 | 36.0 | 0.0 |
| 2011 | 8.0 | 0.0 | 36.0 | 0.0 |
| 2012 | 8.0 | 0.0 | 36.0 | 0.0 |

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

### 1. Activity for the Program

Effectiveness of the research program will be based on publications, external grant support and integration into extension programs

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

| Extension | |
|---|---|
| Direct Methods | Indirect Methods |
| • One-on-One Intervention<br>• Education Class<br>• Group Discussion<br>• Demonstrations<br>• Workshop | • TV Media Programs<br>• Web sites<br>• Newsletters<br>• Public Service Announcement |

### 3. Description of targeted audience

Commodity groups, state agencies, pest management advisors, pesticide applicators, youth, ag ventures program.

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

### 1. Standard output measures

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

| | Direct Contacts Adults | Indirect Contacts Adults | Direct Contacts Youth | Indirect Contacts Youth |
|---|---|---|---|---|
| Year | Target | Target | Target | Target |
| 2008 | 17000 | 30000 | 5000 | 1000 |
| 2009 | 17000 | 30000 | 5000 | 1000 |
| 2010 | 17000 | 30000 | 5000 | 1000 |
| 2011 | 17000 | 30000 | 5000 | 1000 |
| 2012 | 17000 | 30000 | 5000 | 1000 |

### 2. (Standard Research Target) Number of Patents

**Expected Patents**

**2008 :**2 **2009 :**2 **2010 :** 2 **2011 :**2 **2012 :**2

### 3. Expected Peer Review Publications

| Year | Research Target | Extension Target |
|---|---|---|
| 2008 | 0 | 0 |
| 2009 | 0 | 0 |
| 2010 | 0 | 0 |
| 2011 | 0 | 0 |
| 2012 | 0 | 0 |

## V(H). State Defined Outputs

### 1. Output Target

- Number of individuals participating in educational programs

**2008 :**17000 **2009 :**17000 **2010 :** 17000 **2011 :**17000 **2012 :**17000

- Number of research projects conducted on all aspects of Plant Sciences

**2008 :**55 **2009 :**55 **2010 :** 60 **2011 :**62 **2012 :**64

## V(I). State Defined Outcome

### 1. Outcome Target

Adoption of better management practices for crop production

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

**2008 :**200 **2009 :** 200 **2010 :** 200 **2011 :**200 **2012 :** 200

### 3. Associated Knowledge Area(s)

- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 215 - Biological Control of Pests Affecting Plants

**1. Outcome Target**

Adoption of alternative crop technologies

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

| **2008 :** | **2009 :** | **2010 :** | **2011 :** | **2012 :** |
|---|---|---|---|---|
| 100 | 150 | 150 | 150 | 150 |

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

- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 215 - Biological Control of Pests Affecting Plants

**1. Outcome Target**

Adoption of more cost effective means for controlling plant diseases and insect damage

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

| **2008 :** | **2009 :** | **2010 :** | **2011 :** | **2012 :** |
|---|---|---|---|---|
| 1000 | 1000 | 1000 | 1000 | 1000 |

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

- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 215 - Biological Control of Pests Affecting Plants

## V(J). Planned Program (External Factors)

**1. External Factors which may affect Outcomes**

- Public Policy changes
- Government Regulations
- Appropriations changes
- Natural Disasters (drought,weather extremes,etc.)
- Economy

**Description**

Available resources will be the largest factor affecting outcomes followed by climate.

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

### 1. Evaluation Studies Planned

- After Only (post program)

**Description**

{NO DATA ENTERED}

### 2. Data Collection Methods

- {NO DATA ENTERED}

**Description**

{NO DATA ENTERED}