2008 University of California Combined Research and Extension Plan of Work

I. Plan Overview

1. Brief Summary about Plan Of Work

The Division of Agriculture and Natural Resources (ANR) and its two primary units, the Agricultural Experiment Station (AES) and Cooperative Extension (CE), represent the true land grant component of the University of California. While AES faculty and CE specialists are located on the campuses and CE advisors are located in the counties, ANR represents the total of the campus and county programs. The success of ANR in meeting the land grant mission and in serving the needs of California depends on the collaboration, cooperation, and coordination among the AES and CE campus and county programs. The mission of ANR is to serve California through the creation, development and application of knowledge in agricultural, natural and human resources. New knowledge created by AES and CE researchers has led to new ways of doing business for agriculture, better methods of managing California's natural resources and better nutrition for Californians. These are just a few examples of the contributions of ANR programs to California citizens. California and the world are changing at a rapid rate. Some of these changes will impact how ANR will develop and deliver our research and extension programs. As we look to the future, we need to determine the best ways to deploy our current resources to address the pressing needs of California and to look for opportunities to expand our resource base to increase our effectiveness in addressing a broader range of critical issues. The following discusses the implications of these changes for California and identifies opportunities for ANR to help California address the challenges these changes will create. Population Increases The population of California is projected to grow to over 45 million in the next two decades. It is projected that the population will be increasingly diverse and that the numbers of elderly and youth will increase disproportionately. In 2003, 57% of Californians were overweight compared to 38% in 1984. The prevalence of diabetes increased from 4.9% of the population in 1990 to 6.9% in 1998, a 41% increase in eight years. If these trends continue, the obesity epidemic will continue to grow and chronic diseases will increase across all age groups. California will face major challenges in providing housing and employment for this growing population, in providing education for the growing youth population and providing health care for the largest aging population ever experienced. The economic burden of physical inactivity, overweight and obesity in adults exceeded $20 billion for California in 2000 for medical care, lost productivity, and workers' compensation. This will grow dramatically if the obesity epidemic continues. The increasing diversity of the population will challenge all segments of California, from rural communities to cities to urban complexes, to build and maintain viable communities in the face of cultural isolation. Globalization The world is the marketplace for California commodities and products and California is a port for people and goods from around the world. Improved technologies for transportation of food and for reliable communication have been important contributors to increased world trade. Worldwide travel has increased with modern transportation and will likely continue to increase. California agriculture competes in a global market place. This impacts the economic viability of some California agricultural production systems. Costs for labor, energy, water, land and other inputs are ever increasing for California producers. As a result, producers are being driven out of the market. This may result in shifts in the types of crops grown in California as agricultural land is taken out of production. New pests and diseases are introduced into California on a regular basis. An often-quoted rate is a new pest or disease introduction to California every 60 days. These introductions result when contaminated materials are brought (legally or illegally) into California. This will continue to be a problem due to the increase of international products and travelers coming in to California. Stresses on Natural Resources Resources such as land, water, and forests are finite. As the population of California increases, the competition for land and water increases. As urban and suburban development moves into wild lands, the stress on forests and wildlife increases. As wild lands are developed, habitats are fragmented and conflicts between humans and wildlife increase. Inland and marine fisheries are impacted by over-fishing and degraded habitats. A century of fire suppression has increased the threat of catastrophic wildfires for the now mixed natural – developed landscapes. Increased interest in "out-of-doors" recreation has led to greater use of parks, forests and other public lands. Water is the most limiting natural resource in California. Essentially, all available sources of water are being utilized, but the demand continues to rise. Water reallocation and reuse will have to play dominant roles in meeting the future demands for water in California. The current annual water demand of 79.5 million acre-feet is divided among environmental uses (46%), agricultural uses (41%) and urban uses (12%). Urban water demands are projected to expand by 40% by 2030 to accommodate the expected population increases. Soils are the foundation of terrestrial ecosystems and California soils support the

most productive agricultural systems in the world. The practices that have made California growers successful (e.g., high inputs of fertilizers, irrigation water and pesticides) have also been implicated in non-point source pollution. As more Californians use our natural resources for recreation such as fishing, hiking, or off-roading, the pressures on maintaining these resources will increase. Many of these resources are managed by public agencies, thus the burden will fall on these entities to conserve the resources in the face of the increased “use.” Changing Land Use Land use analyses by the ANR Agricultural Issues Center found that an average of 50,000 acres of agricultural land was converted per year to urban and other uses in California between 1988 and 1998. It is clear that this trend is continuing and agricultural lands are being lost to development across California at an accelerating rate. The continued loss of prime and unique agricultural land will impact the agricultural economy of California. Agriculture may no longer exist in some counties and some types of agriculture may be lost from the state. If California is to maintain its agricultural production, it may be necessary to move agricultural production to lands of lower quality as agricultural land is converted to other uses. In general, these lands have lower natural fertility and greater potential for erosion. As lands are urbanized, storm runoff increases (due to increased hardscape), water quality is generally more degraded, and more wastes are created. The likelihood of catastrophic wildfire will increase if housing developments continue to move into forested lands in California. A unique situation for California is that approximately 50% of the land is publicly owned. These public lands are managed by a host of local, state and federal agencies, often without adequate science-based information on management options and often without the budgets to implement optimal management plans. Increasing Regulation Regulations imposed by federal, state, and/or local agencies affect almost every entity (agency, business, individual) in the United States. Many new regulations have been established and the complexity of the requirements has increased, usually with increased restrictions. It is expected that this trend will continue. Agencies at all levels in California are charged with regulating a myriad of activities, programs, and industries. Wastes must be disposed of following established protocols. Emissions that impact air and water quality must be kept below defined standards. Pesticides must be applied in prescribed amounts to crops for which they are registered. Habitat plans must be established and followed for threatened and endangered species. There are two key aspects to any regulation. The first is the development of the regulation and the second is compliance with the regulation. Regulations, such as those related to air and water quality, need to be based on sound science. In the arena of water pollution, point sources are well understood and the appropriate controls are in place. Non-point source pollution is not easily traced or controlled, but attempts at regulating agricultural activities are increasing in order to control pollution. The contributions of stationary sources and automobiles to air pollution are well known and highly regulated. The contributions from agricultural operations and natural systems have not been adequately quantified to support the establishment of air quality regulations for these systems. These are only two examples of areas where ANR must continue to be a leader in providing the necessary research and outreach so that feasible regulations are developed and reasonable outcomes are expected. UC ANR PROGRAMS The situations and trends outlined above will create major challenges for California in the next 20 years. Improving the health of Californians in light of the obesity epidemic, sustaining the economic viability of agriculture in the face of global competition and regulatory constraints, sustaining the use of natural resources with greatly increasing demands, and sustaining functional communities with disengaged populations are a few examples of the challenges. University of California research and education will play a dominant role in addressing these challenges. Many of the challenges facing California in the next few decades must be addressed by comprehensive, multidisciplinary efforts. We no longer have simple problems that can be solved by single researchers. We will be facing complex problems that are spread across systems. The major problems facing California are found among the areas of overlap or interactions among agricultural, natural and urban systems. Water quality can be degraded by agricultural practices, runoff from urban lands or by atmospheric deposition on natural landscapes, all of which will impact the use or reuse of water. The expansion of urban areas onto agricultural lands or into forests creates conflicts that cannot be addressed with simple solutions. At the agricultural-urban interface, we must consider that potential impacts of applying pesticides may extend beyond the agricultural fields to which the pesticides are applied. Sustainability and Viability of California Agriculture Agricultural producers are able to compete in the worldwide marketplace if they can keep their input costs low or if they can command a higher return for high quality products. ANR researchers have contributed to the development of both lower input costs and higher quality products. Research on integrated pest management, precision agriculture, and irrigation management will

help lower input costs. ANR researchers will continue to develop new crops and new varieties for agricultural producers. The need for better management practices and new crops/varieties will become even more important if California agriculture is to remain economically viable in the next decades. ANR also plays a critical role in the education of Californians on how they can comply with applicable regulations. Some examples include: conducting worker safety training courses on harvesting or pesticide application; teaching dairy producers how to meet waste disposal limits; working with ranchers to preserve riparian habitat and thereby make progress toward meeting TMDLs. As new regulations related to agricultural and natural resources are developed, ANR can continue to provide educational programs in new and existing areas to assist clientele with compliance. Work on agricultural production on marginal lands has been an established strength of ANR – from the historic work on reclamation of saline and sodic soils to irrigation and drainage in arid climates to modern work on conservation tillage. As prime agricultural lands are lost, as water supplies become more limited, or as existing crops are no longer economically viable, ANR programs on improved irrigation techniques, soil conservation and new crops and varieties will be developed. The incidence of food borne illness among Californians is higher than the national average. Increasingly, consumers depend upon others to produce and prepare their food. While California leads the nation in identifying the causes of food borne illness, the causative agents are identified and preventive measures are available in only about half the cases. Improving food safety is difficult because of: 1) the complexity of domestic and foreign food systems; 2) rapid changes with these systems; 3) the multiple causes of food borne illnesses; 4) emergence of new pathogens and chemical toxicants; and 5) the increased mobility of the global society that stimulates demands for ethnic and cultural food products which are produced by different production systems. In today's world, the possibility of intentional contamination of the food supply or the nation's agricultural production systems has to be considered. California's food animals are extremely vulnerable to acts of bioterrorism that might employ any of more than a dozen infectious diseases, some of which are equally infectious for animals and humans. ANR programs will direct its research and extension programs to these high priority areas in food safety. CaliforniaPest Management The homogenization of the world through international travel and shipping is resulting in a more uniform biota as pestiferous species are moved regularly across local and international borders. The introduction of pests and diseases in California will only increase as global markets continue to mature. Invasive species not only directly affect our resource base in agriculture, forests, and wild lands, but also in aquatic environments and urban landscapes. They are adversely affecting our wild habitats as native species are displaced or ecosystem traits are altered. These invaders include a broad array of taxa including pathogens (e.g. West Nile virus), insects (e.g. glassy winged sharpshooter), crabs (e.g. green crab), and aquatic and terrestrial weeds and vertebrates (e.g. snakefish). Failure to take on the exclusion, control and management of these invaders could prove disastrous for industries such as agriculture, forestry, and fisheries, as well as our natural environment. Pest and disease management problems facing agricultural, natural and urban systems are only increasing in frequency and complexity as the world continues to functionally shrink. The need for effective eradication or management of exotic pests or invasive species will only continue to rise in importance. ANR has a long history of developing solutions for agricultural pest and disease problems through pioneering work on biological control and integrated pest management. Recent experiences with glassy-winged sharpshooter and Pierce's disease, West Nile virus and sudden oak death show why increased research and outreach efforts related to exotic and invasive pests and diseases are needed. Sustaining California's Natural Resources Natural resource management is a strength of ANR. Programs in forestry, soil and water science, and rangeland management have all contributed to the vitality of California's natural landscapes. While the timber harvesting industry has declined in California, the management of forest lands remains critical due to the fact that much of the state is classified as forested. Our strengths in forest science, together with soil and water science and pest management, provide a base for expanded efforts in this area. ANR programs can contribute to the management of public lands by evaluating various management alternatives and delivering this information to agency personnel. Much of the research conducted on the UC Natural Reserves has application on the public lands. Research and education programs in ANR related to forests, rangelands, oak woodlands, and marine environments can be expanded to meet the needs of public land managers. Water is required for plant and animal life just as it is for human life. Research and outreach on all aspects of water are carried out throughout the University of California. Investigations of water quality, long a strength of ANR programs, will become even more important as water reuse increases. As water is redirected from agricultural and environmental uses to human use,

new technologies, management practices, or conservation efforts will be required if the needs of agriculture, the environment and our growing population are to be met. This is an opportunity for ANR to contribute to solutions for the water issues facing the state. The impacts of agriculture, forestry and range production on water quality have been the focus of ANR programs for many years. The impacts of urban lands on water quality will become increasingly important with the increasing urbanization of the state. The basic research techniques can be transferred from natural and agricultural landscapes to urban ones. The educational programs related to water quality now directed to managers of agricultural and natural landscapes can be extended to urban audiences California Families, Youth and Community DevelopmentPoor diet and physical inactivity contribute to health conditions including, but not limited to obesity, diabetes, glucose intolerance, elevated cholesterol, increased blood pressure, orthopedic disorders, anemia and poor pregnancy outcome. In California, five of the top fatal diseases (heart disease, cancer, stroke, diabetes and liver disease) are largely affected by poor diet, inactivity and obesity. ANR human nutrition programs at the University of California have contributed significantly to the health of Californians over many decades. More recently, attacking obesity has been the focus of many ANR nutrition programs. ANR programs can provide leadership in slowing down or reversing the obesity trend. Youth development programs in ANR contribute to the well being of California youth through 4-H programs. The growing youth population will make these research and extension efforts even more important in the future. The meaningful engagement of young people in communities is probably at an all time low. Compared to previous generations, today's youth participate in school leadership, clubs, and other organizations at substantially low rates. Low rates of civic engagement are attributed to the decline in civic instruction in schools, fewer opportunities for civic participation in the community, increased residential mobility, over-use of television and other media, and social exclusion related to population diversity. Research suggests that civic engagement is important for skill development, particularly leadership and public speaking, self-esteem, academic achievement, and later participation in the civic life as an adult.

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

Year	Extension		Research	
	1862	1890	1862	1890
2008	278.1	0.0	360.6	0.0
2009	278.1	0.0	360.6	0.0
2010	278.1	0.0	360.6	0.0
2011	278.1	0.0	360.6	0.0
2012	278.1	0.0	360.6	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
- Combined External and Internal University External Non-University Panel
- Expert Peer Review

2. Brief Explanation

Scientific Peer Review

Each project funded under the Hatch Act is peer reviewed at the department level in the colleges at Berkeley, Davis, and Riverside. A peer review committee is appointed by the department chair. The committee evaluates the relevance, quality and scientific value of the proposed research. Upon completion of the peer review, the project is also reviewed at the dean's office for USDA compliance and forwarded to the Vice President's office for final review and submission to CSREES.

Merit Review

The Division's organizational structure emphasizes that resource allocation decisions will be driven by programmatic considerations and developed through a broad participatory process. This process will include review of the quality and relevance to program goals for all of the Division's programs.

Workgroups are the focal point and primary mechanism for accomplishing ANR's high priority research and extension goals. They provide grass-roots leadership for program development and evaluation at the statewide level. Structured to bring together CE and AES personnel along with non-ANR partners to work on emerging and continuing issues, they look at the Division's program priorities and determine the programs that will best address these needs. The workgroups are also responsible for evaluating and reporting the program results of the efforts they have supported.

At the statewide level, the UC ANR Program Council is charged with coordinating statewide planning and program policies and providing statewide leadership for coordination of resource allocation. Chaired by the Associate Vice President, it is composed of the Associate Deans for Research and Extension at the three colleges and the school of Veterinary Medicine at the Berkeley, Davis, and Riverside campuses, three CE Regional Directors, and four Program Leaders. The Assistant Vice President-Administrative Services serves as an ex ofico member.

The Program Council will review all ANR budget proposals, program area budget proposals, and position proposals from a statewide perspective and develop recommendations for a comprehensive ANR program budget. These recommendations will then be considered by the Associate Vice President and Vice President for final decisions on allocations.

The Program Council is also charged with providing leadership for five year program reviews of statewide programs and other units. Each of the Division's 20 statewide programs undergoes a program review initiated by the appropriate Program Leader every five years. A review panel of ANR members and external stakeholder representatives is appointed and conducts the review. The review results are presented and discussed by Program Council members who make recommendations to the Associate Vice President for possible actions.

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?

ANR research and extension professionals will plan and deliver programs that address the critical issues facing California in the areas of agriculture, natural resources and human resources by pooling the expertise of California AES and CE academics, by collaborating with colleagues in other institutions, agencies, and states, and by consulting with the external stakeholders. The ANR program planning processes involve stakeholder input through ANR workgroup participation, listening sessions, focus groups and advisory groups. Critical issues identified by external stakeholders include:

Prevention/eradication of invasive species/exotic pests
Increased economic competition from globalization
Decreasing availability of labor and rising cost of labor
Increased regulations impacting agricultural practices and their impact on water, air quality.
Need for sound scientific data for decision makers who make policy/regulations
Increased costs and competition for energy, water etc.
Human nutrition and increase in obesity rates among adults and youth
Changing land use and agriculture/natural resource/urban interface
Opportunities for bioenergy development from agricultural systems

To address these issues, ANR research and extension programs will focus on:
Increased use of genomic technologies for development of crops with higher yields, more water efficient, and more pest/disease resistant.
Increased research and solutions to environmental issues (water and air quality) that are impacted by agricultural

practices.
Nutrition research a priority to address the increase in obesity rates..
Increase use of technology for information dissemination.
Continue role as “honest broker” of information; provide science based information for policy makers as they create and implement regulations.
Provide youth development activities that demonstrate careers in agriculture.

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

The needs of under-served or under-represented groups will be addressed through research and extension programs in all four planned programs. Nutrition programs will focus on adults and children at risk, including individuals living in poverty, recent immigrants and African American, Native American, and Hispanic populations. Agricultural programs will include those focusing on limited resource farmers, including recent immigrants from Southeast Asia. Youth development programs will work with at-risk youth in both urban and rural settings. Curricula and educational materials will be developed for and adapted to specific needs of underserved and underrepresented groups, including translation of materials into the appropriate languages. In addition, programs, demonstrations and field days are often provided in a variety of languages to meet the needs of different groups

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

Following the logic model format, each planned program has descriptions of the anticipated outcomes for FY 2007. There are also descriptions of the activities that will lead to achieving the anticipated outcomes

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

The planned programs will result in improved program effectiveness as collaborative teams of AES faculty, CE specialists and CE advisors address critical issues facing California’s agricultural, natural and human resources. ANR workgroups are formed around statewide issues and the membership is composed of research and extension professionals from the three campuses and 50 county offices as well as the affected stakeholders. This prevents duplication of effort and ensures that the most complete body of knowledge and expertise is available to address the issues by including all those with expertise in relevant areas.

ANR faculty, specialists and advisors also collaborate with their colleagues in other states on topics that cross state boundaries such as invasive pests, youth development issues, and varietal development. This draws together a wider spectrum of expertise and allows for a greater number of stakeholders to be served

IV. Stakeholder Input

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

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

Brief explanation.

The Division will continue to use a variety of mechanisms to seek stakeholder input on the development of Division

program priorities and use of its research, extension and education funds. In addition, CE advisors delivering programs in 57 California counties receive input on local needs from their local clientele on a daily basis. All of the input received from stakeholders is used by ANR members in program planning and implementation at the local, regional, and statewide level.

UC ANR Workgroups/Coordinating Conferences

Division program workgroups and coordinating conferences are the primary mechanism for accomplishing ANR's high priority research and extension goals through grassroots leadership. They bring together AES and CE personnel and non-ANR partners to work on emerging and continuing priority issues in Division program areas. There are 76 Divisionwide workgroups and 8 Coordinating Conferences with a total membership of over 3,200. Last year ANR workgroups involved 1,217 external stakeholders in their program planning process and workgroup activities and projects. The involvement of external stakeholders in the workgroups ensures that real world needs are brought to the attention of the Division as programs are planned and implemented. External stakeholders on the workgroups include individual producers, representatives from local community groups, state and federal agencies, industry groups, consumer groups, and colleagues from other higher education institutions.

Formal advisory groups

The President's Advisory Commission on Agriculture and Natural Resources identifies the education needs of California's agricultural, natural and human resources interests and advises the President on how the University can best meet these needs through its science-based research, classroom instruction and educational outreach. The members represent 28 business, consumer, youth and government leaders from throughout California and meet twice a year to provide input. The Vice President - Agriculture and Natural Resources participates as a member of this Commission and brings the Commission's advice to the Executive Council, the Division's administrative group charged with Divisionwide strategic planning.

Each of the three colleges at Berkeley, Davis and Riverside and the School of Veterinary Medicine at Davis, have external stakeholder advisory councils that meet at least annually to provide feedback on their research, extension, and teaching programs. In addition, departments may have advisory boards.

Several of the Statewide Special Projects and Programs have external Advisory Councils that meet at least annually to review progress and offer recommendations for future program direction.

Commodity Organizations/Marketing Order Boards

Members of these organizations provide annual input on research and extension needs for their commodities to UC ANR members through regular meetings and discussion of funding for research projects. These individual groups also come together on an annual basis to form the California Commodity Commission that meets with the Vice President and offers specific recommendations on program planning and funding issues

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

Brief explanation.

ANR will use a variety of formal and informal methods to identify stakeholders. As described earlier, ANR units have some formal advisory groups such as the President's Advisory Commission on Agriculture and Natural Resources that operates on a systemwide basis while there are also advisory groups at the campus and county level. In addition, internal workgroups have external stakeholder members who have been recommended by the workgroup members. The Division also convenes focus groups, listening sessions and other groups to provide input to its program planning process.

Surveys may be used by both local units and statewide units to solicit recommendations for individuals and groups that may be appropriate to give input on ANR programs and/or critical issues facing the state.

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

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

Brief explanation

{NO DATA ENTERED}

3. A statement of how the input will be considered

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

Brief explanation.

External stakeholder input is used to identify current critical issues, emerging issues and program priorities for the short, medium and long term planning periods. By considering the external stakeholder needs and identification of issues, the Division can assess how best to deploy its resources to address the needs. Division administrators consider the stakeholder input along with internal stakeholder input as they make decisions in the annual budget process and in their strategic planning efforts.

V. Planned Program Table of Content

S. NO.	PROGRAM NAME
1	California Families, Youth and Community Development
2	California Pest Management
3	Sustainability and Viability of California Agriculture
4	Sustaining California's Natural Resources

V(A). Planned Program (Summary)

1. Name of the Planned Program

California Families, Youth and Community Development

2. Brief summary about Planned Program

UC ANR's integrated research and extension activities will focus on human resource issues including nutritional concerns on composition of food, farm-to-fork factors affecting nutritional quality of food and bioavailability of nutrients and disease protective agents, food choices and food consumption patterns in different ethnic and socio-economic subpopulations, breastfeeding and infant and child feeding practices, and lifestyle correlates of healthy nutritional status; youth development issues such as understanding positive youth development, promoting citizenship, leadership, and life skills development, and improving agricultural, science, and environmental literacy; family well-being issues including developing and extending management solutions to improve literacy in resource management; and community development issues including the effects of economic changes and decisions on communities and households. Research will include studies in biochemistry, molecular and cellular biology, genetics, human physiology, psychology, and epidemiology, employing a wide range of experimental, quasi-experimental and clinical methodologies (clinical and feeding trials with human subjects, experimental animal model systems, in vitro analyses using cell culture models, attitude surveys, household food inventories and behavior journals and will focus on the impact of diet and individual nutrients and phytochemicals on development, metabolism and disease prevention), and will be aimed at determining ADME of specific nutrients and protective agents in foods. Research utilizing recombinant DNA technology will be aimed at improving the quantity/availability of nutrients and protective agents in foods and the appeal of health promoting foods. Research will also be directed to improving methodologies for identifying nutrients and their actions. Research will be conducted to develop and evaluate educational programs and other interventions aimed at promoting adoption of lifestyle changes for improved nutritional status. Research will also focus on providing knowledge in non-formal and out-of-school positive youth development activities in citizenship, leadership and life skill development with broad expertise in agricultural and natural resources sciences. We will focus on behavioral change in all areas of human resources and will look at extending management solutions to improve literacy in ag, environ. science, and resource management. Extension activities will focus on achieving lifestyle changes by delivering research-based knowledge to the general population, with special concentration on high-risk groups and youth. Curricula on nutrition, diet and exercise and food buying, storage and preparation, family resource management, parenting, and experiential learning will be developed (fact sheets, pamphlets, DVDs and videos, newsletters, and articles and announcements for broadcast and print media) and will be adapted to specific needs of at-risk groups. Extension efforts will reach individuals and youth directly in one-on-one, family and group settings, and indirectly through nutrition, health, education and childcare professionals trained by UC ANR.

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

305	3%	Animal Physiological Processes
311	1%	Animal Diseases
501	3%	New and Improved Food Processing Technologies
502	2%	New and Improved Food Products
605	2%	Natural Resource and Environmental Economics
608	2%	Community Resource Planning and Development
610	1%	Domestic Policy Analysis
701	1%	Nutrient Composition of Food
702	16%	Requirements and Function of Nutrients and Other Food Components
703	16%	Nutrition Education and Behavior
711	3%	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources.
712	8%	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occuring Toxins
721	2%	Insects and Other Pests Affecting Humans
724	3%	Healthy Lifestyle
801	2%	Individual and Family Resource Management
802	6%	Human Development and Family Well-Being
803	2%	Sociological and Technological Change Affecting Individuals, Families and Communities
805	4%	Community Institutions, Health, and Social Services
806	21%	Youth Development
903	2%	Communication, Education, and Information Delivery

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

1. Situation and priorities

The changing economic, political and social environments in California have major impacts on the use of human resources and contribute to unique challenges for California youth and families. The human resource issues in California cross demographic and socioeconomic lines, affecting all ages, from children to the elderly to diverse

cultural groups. The Human Resource Program focuses on the following four program areas that reflect continuing critical human resources issues. Human Health and Nutrition: Nutritional status of Californians is a critical issue for the state, with five of the top ten fatal diseases-heart disease, cancer, stroke, diabetes and liver disease - directly related to poor diet, inactivity and obesity. Poor food choices and feeding practices negatively impact maternal and child health and contribute to undesirable birth outcomes, nutritional deficiencies, slowed child growth, increased infections, and childhood anemia and obesity. Research demonstrates that poor nutrition during pregnancy predisposes the infant to chronic health problems and that children do not eat enough fruits and vegetables. Childhood obesity is a critical health risk with the number of overweight children in California almost tripling since 1970. Thirty percent of children and adolescents are overweight or at risk of becoming overweight. Youth Development: Youth in California need support systems and opportunities to be prepared to provide leadership and participate effectively in an increasingly complex society. California has a large stake in the healthy development, productivity, and leadership capacity of its next generation to build strong communities and to address the many challenges facing the state. The skills needed by our youth to take advantage of opportunities for personal success include leadership, planning, decision-making, problem solving, critical thinking, and valuing diversity. Research indicates that youth learn from both formal and non-formal forms of education and that peers and environments have a great influence on the educational and extra curricular activities they choose to engage in. Youth learn best through “hands-on” activities and interaction. Youth need opportunities to discover and expand the range of their assets and capacities, and to practice and demonstrate their value to the community. Family and Consumer Well-Being: California has the largest general population and welfare population of any state in the nation. The overall well-being of many individuals in the state is of concern as support programs are reduced or eliminated. More than half of Americans report living paycheck to paycheck. There is a need for additional knowledge, skills, and motivation to build financial security and to strengthen the capacity of families and individuals to create and maintain self-sufficiency. Community Development: Communities, large and small, are struggling to remain solvent and maintain the quality of life for their residents. The ability of communities to respond to critical economic and social issues is complicated by growing populations, greater demands on schools, limited resources, lack of health services, utility systems, a growing shortage of affordable housing, and concerns for resource use and allocation. The ability to respond to

2. Scope of the Program

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

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

1. Assumptions made for the Program

Continuation of public and private funding, in-kind support, and volunteer efforts for programs at current or higher levels, adjusted for inflation.
Continuation of collaborative relationships with statewide and local governmental and non-governmental agencies addressing youth, nutrition and health, and community issues, and with other states’ CE and AES programs.
Availability of qualified research and extension professionals and technical and paraprofessional personnel in the workforce who will accept appointment to vacated and newly created positions.
Continuation of public policy and regulatory environment permitting use of recombinant DNA research techniques for the development of nutritionally improved foods and allowing consumers access to foods and food products of transgenic origin.

2. Ultimate goal(s) of this Program

• Improved overall health and wellness of California adults and children. • Lower maternal and infant morbidity and mortality in California. • Lower incidence of obesity among children and adults in California. • Reduced health disparities among ethnic groups in California. • Lower health care costs for Californians. • Lower costs for public assistance and food assistance programs serving mothers of infants. • Improved citizenship, leadership and life

skills in youth. • Increased engagement in community activities and assumption of leadership responsibilities by youth. • Increased understanding of a wide variety of scientific, technological and agricultural topics by youth. • Increased numbers of youth engaged in healthy non-formal and/or out-of-school activities that result in positive youth development. • New contributions in the field of youth development regarding effective practices. • Improved attitudes, understanding and skills in financial self-sufficiency. • Increased adoption of improved resource management practices and improved utilization of the food dollar by low-income and underserved populations. • Strengthened links between community engagement and academic learning as demonstrated by service learning efforts. • Greater importance placed on the value of civic engagement • Increased involvement by the public in public policy decisions such as use of agricultural, natural and personal resources • Increased number and quality of collaborations among community members, schools, community organizations and agencies • Increased formal and informal program support networks and resources in targeted 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
2008	51.1	0.0	45.1	0.0
2009	51.1	0.0	45.1	0.0
2010	51.1	0.0	45.1	0.0
2011	51.1	0.0	45.1	0.0
2012	51.1	0.0	45.1	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

UC ANR's integrated research and extension activities will conduct research projects, workshops, education classes and demonstrations as well as one-on-one interventions. In addtion, the programs will use PSAs, newsletters, mass media, web sites and collaborations with other agencies and organizations to create and deliver programs
.

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

Extension	
Direct Methods	Indirect Methods
• One-on-One Intervention • Workshop • Group Discussion • Education Class • Demonstrations	• Other 1 (Collabs w/other agencies/orgs) • Billboards • Web sites • TV Media Programs • Public Service Announcement • Newsletters

3. Description of targeted audience

· Adults, children, youth and families in general
· Children in general

· Low and moderate income adults, children, youth and families

· Adults and children at-risk for nutrition-related health problems, including individuals living in poverty, recent immigrants, and African-American, Native American, and Hispanic populations.

· Nutrition and healthcare professionals
· Preschool, primary and secondary school teachers and administrators
· Professional childcare providers
· Public agencies and private organizations concerned with food, nutrition and health

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	194000	0	240000	0
2009	194000	0	240000	0
2010	194000	0	240000	0
2011	194000	0	240000	0
2012	194000	0	240000	0

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

Expected Patent Applications

2008 :5 **2009 :**5 **2010 :** 5 **2011 :**5 **2012 :**5

3. Expected Peer Review Publications

Year	Research Target	Extension Target	Total
2008	210	0	0
2009	210	0	0
2010	210	0	0
2011	210	0	0
2012	210	0	0

V(H). State Defined Outputs

1. Output Target

- Classes/Short Courses Conducted

2008 :1100 **2009 :**1100 **2010 :** 1100 **2011 :**1100 **2012 :**1100

- Workshops Conducted

2008 :1300 **2009 :**1300 **2010 :** 1300 **2011 :**1300 **2012 :**1300

- Demonstrations and Field Days Conducted

2008 : 130 **2009 :** 130 **2010 :** 130 **2011 :** 130 **2012 :** 130

- Newsletters Produced

2008 : 300 **2009 :** 300 **2010 :** 300 **2011 :** 300 **2012 :** 300

- Web Sites Created or Updated

2008 : 60 **2009 :** 60 **2010 :** 60 **2011 :** 60 **2012 :** 60

- Research Projects Conducted

2008 : 150 **2009 :** 150 **2010 :** 150 **2011 :** 150 **2012 :** 150

- Videos, Slide Sets, and other AV or Digital Media Educational Products Created

2008 : 80 **2009 :** 80 **2010 :** 80 **2011 :** 80 **2012 :** 80

- Manuals and Other Printed Instructional Materials Produced

2008 : 360 **2009 :** 360 **2010 :** 360 **2011 :** 360 **2012 :** 360

V(I). State Defined Outcome

1. Outcome Target

Percentage of youth and adults in the general population participating in nutrition education gaining knowledge of nutrition, healthy food choices and dietary practice

2. Outcome Type : Change in Knowledge Outcome Measure

2008 : 55 **2009 :** 55 **2010 :** 55 **2011 :** 55 **2012 :** 55

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior
- 802 - Human Development and Family Well-Being

1. Outcome Target

Percentage of individuals and families participating in healthy lifestyle education who will gain knowledge of healthy lifestyle practices

2. Outcome Type : Change in Knowledge Outcome Measure

2008 : 70 **2009 :** 70 **2010 :** 70 **2011 :** 70 **2012 :** 70

3. Associated Knowledge Area(s)

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

1. Outcome Target

Percentage of individuals participating in food safety education gaining knowledge of safe food handling and preparation techniques

2. Outcome Type : Change in Knowledge Outcome Measure

2008 :	**2009 :**	**2010 :**	**2011 :**	**2012 :**
65	65	65	65	65

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior
- 802 - Human Development and Family Well-Being

1. Outcome Target

Percentage of low-income individuals and families participating in nutrition and consumer education who will gain knowledge of food resource management techniques

2. Outcome Type : Change in Knowledge Outcome Measure

2008 :	**2009 :**	**2010 :**	**2011 :**	**2012 :**
70	70	70	70	70

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior
- 802 - Human Development and Family Well-Being

1. Outcome Target

Percentage of youth participating in 4H clubs acquiring leadership and civic skills

2. Outcome Type : Change in Knowledge Outcome Measure

2008 :	**2009 :**	**2010 :**	**2011 :**	**2012 :**
40	40	40	40	40

3. Associated Knowledge Area(s)

- 806 - Youth Development

1. Outcome Target

Percentage of youth participating in 4H club, community, in-school and afterschool education acquiring planning, problem solving, teamwork and other life skills

2. Outcome Type : Change in Knowledge Outcome Measure

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

3. Associated Knowledge Area(s)

- 806 - Youth Development

1. Outcome Target

Percentage of low-income adults and families participating in nutrition education adopting recommended dietary practices

2. Outcome Type : Change in Action Outcome Measure

2008 :	**2009 :**	**2010 :**	**2011 :**	**2012 :**
60	60	60	60	60

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior
- 802 - Human Development and Family Well-Being

1. Outcome Target

Percentage of low-income children and youth participating in nutrition education adopting recommended dietary practices

2. Outcome Type : Change in Knowledge Outcome Measure

2008 :	**2009 :**	**2010 :**	**2011 :**	**2012 :**
40	40	40	40	40

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior
- 802 - Human Development and Family Well-Being

1. Outcome Target

Percentage of low-moderate income individuals and families participating in nutrition and consumer education adopting recommended food resource management techniques

2. Outcome Type : Change in Action Outcome Measure

2008 :	**2009 :**	**2010 :**	**2011 :**	**2012 :**
70	70	70	70	70

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior

1. Outcome Target

Percentage of individuals participating in food safety education adopting safe food handling and preparation techniques

2. Outcome Type : Change in Action Outcome Measure

2008 :	**2009 :**	**2010 :**	**2011 :**	**2012 :**
55	55	55	55	55

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior
- 802 - Human Development and Family Well-Being

1. Outcome Target

Percentage of youth participating in 4-H clugs assuming leadership roles in organizations or taking part in community affairs.

2. Outcome Type : Change in Action Outcome Measure

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

3. Associated Knowledge Area(s)

- 806 - Youth Development

1. Outcome Target

Percentage of children and youth participating in 4H club, community, in-school and afterschool education increasing their level of science, agricultural and environmental literacy

2. Outcome Type : Change in Knowledge Outcome Measure

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

3. Associated Knowledge Area(s)

- 806 - Youth Development

1. Outcome Target

Percentage of low income children and youth participating in nutrition education gaining knowledge of nutrition, healthy food choies, and dietary practices.

2. Outcome Type : Change in Knowledge Outcome Measure

2008 :	**2009 :**	**2010 :**	**2011 :**	**2012 :**
60	60	60	60	60

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior
- 802 - Human Development and Family Well-Being

1. Outcome Target

Percentage of low income adults and families participating in nutrition education gaining knowledge of nutrition, healthy food choices and dietary practices.

2. Outcome Type : Change in Knowledge Outcome Measure

2008 :	**2009 :**	**2010 :**	**2011 :**	**2012 :**
50	50	45	50	50

3. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior
- 802 - Human Development and Family Well-Being

1. Outcome Target

Percentage of parents and parent educators participating in parent education gaining knowledge of pareanting techniques to promote child development and learning.

2. Outcome Type : Change in Knowledge Outcome Measure

2008 :	**2009 :**	**2010 :**	**2011 :**	**2012 :**
75	75	75	75	75

3. Associated Knowledge Area(s)

- 802 - Human Development and Family Well-Being

1. Outcome Target

Percentage of individuals and families participating in nutrition and health education programs becoming more inclined to adopt healthier dietary and lifestyle practices

2. Outcome Type : Change in Knowledge Outcome Measure

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

3. Associated Knowledge Area(s)

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

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
- Populations changes (immigration,new cultural groupings,etc.)

Description

NATURAL DISASTERS: Californians are constantly vulnerable to catastrophic economic loss, widespread displacement of human populations, and loss of physical and social infrastructure as a result of a major earthquake. Such circumstances could constrain UC ANR's ability to carry-out the research and extension activities planned for this program and to achieve the expected outcomes, because resources would likely be diverted to more acute health and safety issues, and UC ANR's own infrastructure may require rebuilding before programs can be resumed.ECONOMY: Downturns in the macro-economy can affect program outcomes in two ways: (1) Reduced income levels in the population increase the number of individuals at risk for poor nutritional status, related health problems, and financial insufficiency and the severity of their risk, making successful intervention more difficult; (2) Economic recession leads to reductions in public and private support for research and extension activities necessary

for achievement of the expected outcomes.APPROPRIATIONS CHANGES: Reductions in state and federal appropriations for UC ANR programs will jeopardize the organization's ability to conduct the research and extension activities planned for this program and thus put the expected outcomes at risk.PUBLIC POLICY CHANGES AND GOVERNMENTAL REGULATIONS: Achievement of expected outcomes would be jeopardized by policies and regulations that inhibit recombinant DNA research techniques for the development of nutritionally improved foods and restricting consumers access to safe foods and food products of transgenic origin that could improve their nutritional status.COMPETING PUBLIC PRIORITIES: Changes in public priorities could result in reduced governmental and private support for science and education programs in general, and for human resources research and extension in particular, thus constraining UC ANR's ability to conduct activities necessary for achieving the expected outcomes.POPULATION CHANGES: In recent years many new ethnic groups have immigrated to California in large numbers, creating even greater cultural diversity in an already heterogeneous society. Any further magnifying of this diversity of values and lifestyles, either by increased numbers of immigrants or introduction of new ethnic groups, would add to the challenges of successful intervention and achievement of expected outcomes.

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

1. Evaluation Studies Planned

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

Description

{NO DATA ENTERED}

2. Data Collection Methods

- Sampling
- Whole population
- Mail
- Telephone
- On-Site
- Structured
- Unstructured
- Case Study
- Observation
- Tests
- Journals
- Other (Web Surveys)

Description

{NO DATA ENTERED}

V(A). Planned Program (Summary)

1. Name of the Planned Program

California Pest Management

2. Brief summary about Planned Program

UC ANR's integrated research and extension activities will address the issue of the negative impact of key pest species on plant and animal systems in agricultural, natural, and urban environments. This will include a specific focus on understanding of invasive species and their modes of entry into the state, assisting in the eradication or reducing the spread of newly introduced species, and developing methods of effectively dealing with recent introductions. The priority components of pest management that ANR research and extension programs will address include the basic biology of pest species; genetics and systematics (origin, diversity); epidemiology and modeling invasion biology; prediction of social/economic consequences; biological control; cultural control; prediction, early detection, and prevention of invasion; management of weeds; and alternatives to chemical pesticides.

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	1%	Soil, Plant, Water, Nutrient Relationships
123	1%	Management and Sustainability of Forest Resources
133	1%	Pollution Prevention and Mitigation
135	1%	Aquatic and Terrestrial Wildlife
136	1%	Conservation of Biological Diversity
201	1%	Plant Genome, Genetics, and Genetic Mechanisms
206	1%	Basic Plant Biology
211	17%	Insects, Mites, and Other Arthropods Affecting Plants
212	28%	Pathogens and Nematodes Affecting Plants
213	7%	Weeds Affecting Plants
214	1%	Vertebrates, Mollusks, and Other Pests Affecting Plants
215	10%	Biological Control of Pests Affecting Plants
216	19%	Integrated Pest Management Systems
304	1%	Animal Genome
305	1%	Animal Physiological Processes
311	1%	Animal Diseases
312	1%	External Parasites and Pests of Animals
605	2%	Natural Resource and Environmental Economics
721	4%	Insects and Other Pests Affecting Humans
723	1%	Hazards to Human Health and Safety

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

1. Situation and priorities

The management of key pests in California's diverse agricultural, natural, and urban ecosystems is an on going effort. The same environment that allows a tremendous plant, crop, and animal diversity also provides limitless niches for various pest organisms, including weeds, insects, plant diseases, nematodes, mites, and vertebrate pest

and disease causing organisms. Pest management is an important production concern to California farmers because it affects profitability from two sides: costs of production and loss of yield/income. Pest organisms, including invasive species, have had tremendous impact on e functions in the wide diversity of California's natural marine, aquatic, and terrestrial ecosystems. Similarly, pests damage structures and landscapes, as well as vector pathogens to the residents of California urban environments. Integrated pest management utilizes a wide range of biological, cultural and physical controls with chemical control restricted to an as-needed basis when monitoring indicates economic thresholds have been exceeded. Programs developed to manage pests require constant maintenance and adjustment as new pests are introduced, new crops are brought into production, new crop protection products are introduced or removed, and new technologies are introduced (advances in weather monitoring, pest modeling, site specific agriculture, GIS applications, etc.).

The research and extension programs within the University of California have established a long record of developing research-based solutions to pest problems in the state. Investigations into the management of invasive weed species have provided new tools for the agricultural, livestock range, and natural resource communities to remediate areas that had become significantly degraded because of weed invasions. Studies of the basic biology of pest species have resulted in the development of alternatives to chemical pesticides, establishment, conservation, and augmentation of natural enemies for biological control, implementation of new approaches for cultural controls of pest species, and discovery of new tools for the prediction, early detection, and prevention of invasion by arthropods, weed, and pathogens causing plant and animal diseases. More fundamental research efforts have provided information on the genetics and systematics (origin, diversity) of invasive pests. These studies are supported by computer modeling efforts that provide a more detailed understanding of the epidemiology of invasion biology. Research continues on prediction of the social/economic consequences of pests in the state and the benefits that accrue from integrated pest management solutions.

The guiding principle for setting priorities is that ANR research and extension programs serve the public good of California through the creation, development and application of knowledge addressing critical issues in agricultural, natural and related human resources, through a system of community-driven research and outreach programs with CE advisors supported by CE specialists and AES scientists. External private and government agency clientele are formally and informally consulted in the process of identifying the critical pest management issues as well as developing and delivering science-based information to quantify pest situations and help guide pest control decision-making. A similar model guides research and education related to increasing the understanding of invasive species, modes of entry into the state, assisting in the eradication or reducing the spread of newly introduced pest species, and developing methods of effectively dealing with recent introductions.

2. Scope of the Program

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

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

1. Assumptions made for the Program

The UC ANR Core Values provide the fundamental assumptions for guiding action and decisions at all levels of the Division and, specifically, for programming in pest management. These core values include the highest standards of ethical behavior, honesty and integrity, with the recognition that the trust and confidence of the public are absolutely essential to success. Academic excellence and credibility as an objective source of knowledge are critical to effective communication with clientele. Scientifically valid research is a foundation for anticipating problems and developing practical solutions. Responsiveness to state and local needs in California, and consideration of the global context that shapes these needs, are fundamental to the contributions of the research and extension mission.

Diversity within the organization, equal access to knowledge by all people, and equal opportunity for self reliance through education are critical for implementation of research-based solutions. Collaboration, teamwork and mutual respect, in partnership with other organizations, and in interaction with our clientele are vital for developing programs that are inclusive and relevant. Academic freedom, with the recognition that individual freedom goes hand in hand with a high standard of professional responsibility and personal accountability to ANR's land grant mission. Pest management research and extension activities integrate fundamental and applied science to develop solutions to problems. Identification of key issues comes from a blend of investigator experience, expertise in specific disciplines, collaborative interdisciplinary investigations with other scientists, consultations with clientele, and cooperation with cooperative extension academics. These collaborations are effective in addressing scientific issues and providing information that can be adapted by end-user clientele. Availability of sources of competitive as well as basic institutional support focuses efforts on critical issues and facilitate development of effective collaborations. The UC Statewide IPM program, the Exotic/ Invasive Pests and Diseases Research Program, and the UC Mosquito Research Program administer competitive grants programs with review panels representing both the scientific and clientele communities that prioritize research and extension efforts in critical areas. All of these programs require a plan for outreach or implementation of the results. The investigative team considers how the information will be adopted based on what has been successful, identifies the clientele and works with them to motivate adoption of new approaches. For example, ANR AES scientists, CE Specialists and Advisors, supported by internal and external competitive funds worked together to identify/synthesize semiochemicals used by insect pests, developed the formulations and deployment approaches, generated data on efficacy of insect suppression, and worked with clientele in field demonstrations. Development and implementation of this new pest management approach has resulted in drastic reductions in pesticide use on fruit crops in California.

2. Ultimate goal(s) of this Program

· Increased utilization of effective pest monitoring and use of economic thresholds to make treatment decisions.
· Increased awareness, broad adoption and use of new and improved pest management practices and products, including greater use of pesticide resistance management practices, increased use of less toxic and more environmentally safe pesticides and greater reliance on alternative methods of control such as resistant varieties, biological controls, and/or cultural controls.
· Improved understanding of the complexity of pest management through demonstration of knowledge of systems and interaction of biological, climatological, ecological and other factors in managing pests.
· Increased professionalism of crop and pest consultants through improved certification programs.
· Development or refinement of risk assessments for various invasive species and their impacts and action plans to include applied research and extension components.
· ·Development of a more proactive California approach to deal with potential invasive species including the development and implementation of methods of preventing entry of such species into the state.
· Cooperation among California Department of Food and Agriculture, U.S. Department of Agriculture-Agricultural Research Service, UC ANR, and other agencies when newly invasive species are detected to deal with these species through coordinated local eradication, expanded monitoring, suppression, and/or management and by focusing and coordinating research and extension efforts.
· Better and more accurate quantification and communication of the economic and sociological consequences of invasive species for both past and potential introductions.
· A coordinated and integrated approach by UC to deal with invasive species negatively impacting the state
· More reliable, effective and economic management of important pest species by pest control advisors, growers and other horticulturalists.
· Reduced use of environmentally significant or toxic pesticides.
· Sustained profitability of California agriculture through more effective and reliable pest management practices.

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	63.5	0.0	77.2	0.0
2009	63.5	0.0	77.2	0.0
2010	63.5	0.0	77.2	0.0
2011	63.5	0.0	77.2	0.0
2012	63.5	0.0	77.2	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

UC ANR's integrated research and extension activities will conduct research projects, workshops, education classes and demonstrations as well as one-on-one interventions. In addition, the programs will use PSAs, newsletters, mass media, web sites and collaborations with other agencies and organizations to create and deliver programs

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

Extension	
Direct Methods	**Indirect Methods**
• One-on-One Intervention • Demonstrations • Group Discussion • Workshop • Education Class	• Public Service Announcement • TV Media Programs • Billboards • Other 1 (Collabs w/other agencies/orgs) • Newsletters • Web sites

3. Description of targeted audience

Farmers
Ranchers
Rangeland owners/managers
Landscaping professionals
Owners/operators of allied agricultural industries
General public
Crop and pest consultants

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	53000	0	0	0
2009	53000	0	0	0
2010	53000	0	0	0
2011	53000	0	0	0
2012	53000	0	0	0

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

Expected Patent Applications

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

3. Expected Peer Review Publications

Year	Research Target	Extension Target	Total
2008	220	0	0
2009	220	0	0
2010	220	0	0
2011	220	0	0
2012	220	0	0

V(H). State Defined Outputs

1. Output Target

- Classes/Short Courses Conducted

  2008 : 90 **2009 :** 90 **2010 :** 90 **2011 :** 90 **2012 :** 90

- Workshops Conducted

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

- Demonstrations and Field Days Conducted

  2008 : 110 **2009 :** 110 **2010 :** 110 **2011 :** 110 **2012 :** 110

- Newsletters Produced

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

- Web Sites Created or Updated

  2008 : 45 **2009 :** 45 **2010 :** 45 **2011 :** 45 **2012 :** 45

- Research Projects Conducted

2008 :480 **2009 :**480 **2010 :** 480 **2011 :**480 **2012 :**480

- Videos, Slide Sets and Other AV or Digital Media Educational Products Created

2008 :10 **2009 :**10 **2010 :** 10 **2011 :**10 **2012 :**10

- Manuals and Other Printed Instructional Materials Produced

2008 :70 **2009 :**70 **2010 :** 70 **2011 :**70 **2012 :**70

V(I). State Defined Outcome

1. Outcome Target

Percentage of farm, ranch, range and landscaping owner/operators and managers and allied industry professionals participating in the program gaining knowledge of integrated pest management strategies and techniques

2. Outcome Type : Change in Knowledge Outcome Measure

2008 :45 **2009 :** 45 **2010 :** 45 **2011 :**45 **2012 :** 45

3. Associated Knowledge Area(s)

- 133 - Pollution Prevention and Mitigation
- 136 - Conservation of Biological Diversity
- 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
- 215 - Biological Control of Pests Affecting Plants
- 216 - Integrated Pest Management Systems

1. Outcome Target

Percentage of farm, ranch, range and landscaping owner/operators and managers and allied industry professionals participating in the program gaining knowledge of pesticide and pharmaceutical efficacy and optimal use

2. Outcome Type : Change in Knowledge Outcome Measure

2008 :45 **2009 :** 45 **2010 :** 45 **2011 :**45 **2012 :** 45

3. Associated Knowledge Area(s)

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

1. Outcome Target

Percentage of farm, ranch and landscaping owner/operators and managers and allied industry professionals participating in the program adopting recommended prevention, detection and monitoring, and treatment practices for integrated pest management

2. Outcome Type : Change in Action Outcome Measure

2008 :40 **2009 :** 40 **2010 :** 40 **2011 :**40 **2012 :** 40

3. Associated Knowledge Area(s)

- 133 - Pollution Prevention and Mitigation
- 136 - Conservation of Biological Diversity

- 215 - Biological Control of Pests Affecting Plants
- 216 - Integrated Pest Management Systems

1. Outcome Target

Percentage of farm, ranch, range and landscaping owner/operators and managers and allied industry professionals participating in the program realizing lower costs for pest prevention and management

2. Outcome Type : Change in Condition Outcome Measure

2008 :	**2009 :**	**2010 :**	**2011 :**	**2012 :**
15	15	15	15	15

3. Associated Knowledge Area(s)

- 605 - Natural Resource and Environmental Economics

1. Outcome Target

Percentage of farm, ranch, range and landscaping owner/operators and managers and allied industry professionals participating in the program gaining knowledge of strategies and techniques for management of invasive species

2. Outcome Type : Change in Knowledge Outcome Measure

2008 :	**2009 :**	**2010 :**	**2011 :**	**2012 :**
40	40	40	40	40

3. Associated Knowledge Area(s)

- 135 - Aquatic and Terrestrial Wildlife
- 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
- 215 - Biological Control of Pests Affecting Plants
- 216 - Integrated Pest Management Systems

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

- Economy
- Natural Disasters (drought,weather extremes,etc.)
- Other (Avail. of grad students/others)
- Appropriations changes
- Populations changes (immigration,new cultural groupings,etc.)
- Government Regulations
- Public Policy changes

Description

Natural disasters make it difficult to implement some pest management options. For example, water management may be a critical factor in maintaining plant vigor and resistance to insect and disease activities. Severe drought and reduced water applications may have significant detrimental impacts on plants and animals, making them more susceptible to pests. Reduced moisture availability may also have significant negative impacts on biological control efforts. Severe weather may spread pest species into previously uninfested areas, having a significant negative impact on risk assessments and implementation of sustained pest management approaches. A downturn in the economy may have significant negative consequences on the adoption of pest management approaches. If the value

of a commodity goes down, the more costly or higher risk pest management tactics have reduced appeal for adoption. Appropriations changes can have a direct impact on the availability of funds for research and implementation projects. Reduced appropriations to units responsible for protection of natural environments can reduce implementation of management strategies. If funds are unavailable, pest and disease problems can quickly shift from moderate to severe conditions. State and federal agencies have responsibilities to respond to invasive species in detection and eradication programs. Reductions in budgets can result in slower detection rates and inability to provide adequate responses as new pests and diseases are discovered. The reduced response increases the likelihood of establishment of invasive species and negative impacts on agricultural, natural, and urban environments. Public policy can provide the impetus for adoption of new pest management approaches. Changes in those policies can determine whether new technologies are implemented and the rate of integration of new approaches into established pest management programs aimed at solving problems. Government regulations can affect licensing requirements of pest management professionals and the availability of tools. For example, a changing regulatory environment around application of behaviorally active natural products has limited their availability because there is uncertainty whether or not they are classified as pesticides. Similarly, the use of genetically engineered crop plants and the classification of biological control agents have been subject to shifting governmental regulations. A changing regulatory environment has a significant detrimental impact on development and adoption of pest management tactics. California is blessed with a rich and diverse cultural environment. However, there is a significant educational challenge to reach out to new residents and effectively communicate the economic/sociological consequences of invasive species. Availability of graduate students and qualified candidates to fill emerging vacancies in academic positions in applied pest management presents a significant challenge with fewer students being trained in these fields. There is an increasing need for public and private professionals in the research, education, extension, and consultant communities. However, fewer students are being trained to replace the individuals who are retiring.

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

1. Evaluation Studies Planned

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

Description

{NO DATA ENTERED}

2. Data Collection Methods

- Tests
- On-Site
- Mail
- Other (Web Surveys)
- Whole population
- Unstructured
- Observation
- Sampling
- Case Study
- Telephone

Description

{NO DATA ENTERED}

V(A). Planned Program (Summary)

1. Name of the Planned Program

Sustainability and Viability of California Agriculture

2. Brief summary about Planned Program

UC ANR's integrated research and extension activities will address the ecological sustainability and economic viability of agriculture and the environmental and social issues that impact upon or that are impacted by agricultural production systems. ANR programs will develop and transfer technologies and reduced input systems that will contribute to long-term sustainability. The priority components of sustainability and viability of agriculture that ANR research and extension programs will address include introduction of new crops/breeds; application of biotechnology; organic production strategies; economic and marketing analysis; social/biological impacts of agriculture and agricultural land; waste management strategies, including recycling of dairy manure and waste water; waste management strategies by studying recycling opportunities, waste containment, waste abatement and potential use of waste materials and all aspects of soil analysis, management and quality assessment, as well as the understanding of the parameters influencing soil quality and the development of sustainable soil-management practices to support agricultural productivity, as well as organisms and systems in diverse natural and human-made settings.

Efforts will also be directed at consumer education including safe in-home food preparation; food handler and preparer practices and education; development of on-farm production practices to control contamination of pre harvest foods from microbes, toxins, and chemicals; development of effective approaches to destroy or control food-borne pathogens on-farm and development of systems to control vectors on-farm, including understanding the biology of the vectors.

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	7%	Soil, Plant, Water, Nutrient Relationships
111	2%	Conservation and Efficient Use of Water
201	14%	Plant Genome, Genetics, and Genetic Mechanisms
202	6%	Plant Genetic Resources
203	6%	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
204	5%	Plant Product Quality and Utility (Preharvest)
205	16%	Plant Management Systems
206	11%	Basic Plant Biology
211	2%	Insects, Mites, and Other Arthropods Affecting Plants
212	6%	Pathogens and Nematodes Affecting Plants
213	2%	Weeds Affecting Plants
302	2%	Nutrient Utilization in Animals
305	2%	Animal Physiological Processes
307	4%	Animal Management Systems
501	3%	New and Improved Food Processing Technologies
502	2%	New and Improved Food Products
601	3%	Economics of Agricultural Production and Farm Management
603	2%	Market Economics
604	1%	Marketing and Distribution Practices
723	4%	Hazards to Human Health and Safety

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

1. Situation and priorities

California agriculture faces unprecedented challenges from world competition, environmental constraints, and increasing input costs. The globalization of the market place has resulted in significant competition from overseas producers that have lower labor, energy or regulatory costs. If they do not, some of our competitors are heavily

subsidized. California producers are being called upon to greatly reduce their impact on the air. The Great Central Valley for instance is heavily impacted by increasing population and concomitant air degradation. Farmers and other businesses are being asked to reduce both dust and combustion emissions. New federal and state regulations aimed at improving the quality of both ground and surface waters will significantly change many farming and ranching practices. The dairy industry will need to drastically change the way they manage nitrogen, water and waste in order to avoid significant regulatory sanctions. New technologies will be needed to manage the nitrogen and nutrient cycles on diaries and cropping systems.
Maintaining or improving soil quality is important to long-term agricultural productivity, to water quality, and to the sustainability of agricultural, natural and urban systems in California. Soil quality plays a role in the complex interactions of microbial communities, which influence nutrient cycling and disease suppression, but these interactions, and their relationships to plant establishment need to be better understood
An exploding population in the West is resulting in significant competition for land and water. Prime farmland is being lost at increasing rates in all of the western states. Local and state governments will need assistance from the land grant system in dealing with land use issues and accomplishing policies aimed as slowing the loss of critical farmlands. Urban systems have been identified as major sources of nutrient and pesticide pollution to surface waters. Developers, homeowners, water districts, school districts, cities and commercial nurseries need new management tools to reduce this negative impact.
Ensuring the safety of the food supply, as food-borne illnesses can result in lost productivity, increased medical expenses and death. Consumer health and agricultural sustainability require a food supply that is produced, processed, distributed, and prepared in a manner that prevents or minimizes contaminants. Loss of prime farmland through urbanization and parcelization will gradually increase America's dependence on foreign sources of certain foods. While the U.S. historically has been a net agricultural exporter, 2004 was the first year that the nation had a net agricultural trade deficit. Domestic food is considered the safest in the world and safer than some sources that do not have pesticide and food safety standards comparable to those in California. The global food supply provides consumers with products originating from plant and animal sources around the world, increasing the risk of food borne illnesses. The health of livestock and poultry is a pivotal control point in assuring food safety for consumers
Maintaining an environmentally and economically sustainable system for production of food, fiber, and ornamentals.
Agriculture is a large and highly valued component of California's economy. The profitability of California farms has been diminished by sharply rising production costs, depressed value of some crops due to overproduction, increased competition for water, increased diversity and availability of imported crops, and trade restrictions that limit export markets. Organic production of plants and animals is a rapidly growing sector of agriculture that will help shape economically and environmentally sustainable agricultural systems. California agriculture is at a critical point in its evolution. To remain economically viable, California producers must continue to improve the efficiency and quality of agricultural production in an ecologically and environmentally sound manner.

2. Scope of the Program

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

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

1. Assumptions made for the Program

In the area of food safety and security, it is assumed that we will be presented with new microbial and chemical threats on an ongoing basis. It is also presumed that these threats can be natural, accidental or intentional. The loss of farmlands, and the globalization of the world market place will gradually increase our dependence on foreign sources for certain components of our food system. This dependence will present additional venues of vulnerability for food contamination. Foreign sources will also provide additional opportunities for intentional tampering and the introduction of substances and organisms. These substances will either cause injury to humans or simply cause alarm among consumers. This will, in turn, disrupt the domestic market place. This dependence may also make the

US market place more sensitive to disruptions because of global transportation issues, energy shortages or political unrest.

The sustainability of our agricultural systems will be challenged by increasing energy costs all levels of the production and delivery system. All forms of energy inputs – electricity, diesel, gasoline, natural gas and propane will substantially increase in cost over the long term. Since agriculture is energy intensive in its present form, it will be especially vulnerable. Even organic systems will need to reduce energy dependence. It must be assumed that labor-intensive crops will have significant problems obtaining and holding labor forces during peak demand periods. This will be due to disruptions to the flow of labor from Latin America and also to competition from other industries. New regulatory initiatives on the part of state and federal regulatory agencies will create new costs that are unique to the US and to California that other global competitors will not have. Environmental concerns among consumers will create a market demand for products that are produced with more “environmentally-friendly” systems. The global market place will favor low-cost producers of most commodities. This will result in the decline of certain sectors of American agriculture. Production of these products will shift to those countries that can deliver the product to the world market place most competitively. US foreign policy aimed at assisting lesser-developed nations and at stabilizing relations with countries such as China will result in project from these countries entering the US market place at prices that are significantly lower than domestic sources

2. Ultimate goal(s) of this Program

· Development and adoption of new crops and breeds that improve the competitive position of California producers.
· Adoption of new technologies and improved cultural, water, and nutritional systems by California producers that lead to more efficient and less costly production, with less detrimental impacts on the environment.
· Adoption of improved management information, forecasting and decision-making systems by California producers that improve competitive advantage and profitability.
· California agriculture remains economically viable, maximizing its opportunities in markets where it has a competitive advantage.
· California commodities are produced with minimal or no detrimental impact on the state’s natural resources and environment.
· Improved food safety knowledge and practices for food suppliers, processors, retailers and consumers.
· Improved food handling behaviors throughout the food production, processing, storage and consumption system.
· Adoption of new detection techniques and countermeasure practices for food contaminants.
· Increased producer, handler and consumer knowledge and improved skills in appropriate use and management of new food technologies, additives and contaminants.
· Decrease in the number of Californians who suffer from food-borne illness each year.
· Reduction in the cost of medical care, lost work hours and deaths due to food-borne illness.
· Implementation and coordination of dairy producer manure and nutrient management plans.
· Adoption and use of models for cooperative agreements and relationships all along the waste stream to improve waste management practices and systems.
· Improved communication between regulators and producers leading to development and utilization of environmental quality assurance 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
2008	100.0	0.0	156.0	0.0
2009	100.0	0.0	156.0	0.0
2010	100.0	0.0	156.0	0.0
2011	100.0	0.0	156.0	0.0
2012	100.0	0.0	156.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

UC ANR's integrated research and extension activities will conduct research projects, workshops, education classes and demonstrations as well as one-on-one interventions. In addition, the programs will use PSAs, newsletters, mass media, web sites and collaborations with other agencies and organizations to create and deliver programs
.

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

Extension	
Direct Methods	**Indirect Methods**
• Group Discussion • Education Class • One-on-One Intervention • Workshop • Demonstrations	• Newsletters • TV Media Programs • Web sites • Other 1 (Collabs w/other agencies/orgs) • Public Service Announcement

3. Description of targeted audience

Farmers/ranchers and rangeland owners/operators/managers
Allied agricultural industries professionals
Landscaping professionals
Organic famers
Consumers
Food suppliers
Food processors
Food retailers

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	107000	0	9100	0
2009	107000	0	9100	0
2010	107000	0	9100	0
2011	107000	0	9100	0
2012	107000	0	9100	0

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

Expected Patent Applications

2008 : 17 **2009 :** 17 **2010 :** 17 **2011 :** 17 **2012 :** 17

3. Expected Peer Review Publications

Year	Research Target	Extension Target	Total
2008	630	0	0
2009	630	0	0
2010	630	0	0
2011	630	0	0
2012	630	0	0

V(H). State Defined Outputs

1. Output Target

- Classes/Short Courses Conducted

  2008 : 280 **2009 :** 280 **2010 :** 280 **2011 :** 280 **2012 :** 280

- Workshops Conducted

  2008 : 210 **2009 :** 210 **2010 :** 210 **2011 :** 210 **2012 :** 210

- Demonstrations and Field Days Conducted

  2008 : 150 **2009 :** 150 **2010 :** 150 **2011 :** 150 **2012 :** 150

- Newsletters Produced

  2008 : 270 **2009 :** 270 **2010 :** 270 **2011 :** 270 **2012 :** 270

- Web Sites Created or Updated

  2008 : 90 **2009 :** 90 **2010 :** 90 **2011 :** 90 **2012 :** 90

- Research Projects Conducted

2008 :540 **2009 :**540 **2010 :** 540 **2011 :**540 **2012 :**540

- Videos, Slide Sets and other A/V or Digital Media Educational Products Created

2008 :15 **2009 :**15 **2010 :** 15 **2011 :**15 **2012 :**15

- Manuals and Other Printed Instructional Materials Produced

2008 :80 **2009 :**80 **2010 :** 80 **2011 :**80 **2012 :**80

V(I). State Defined Outcome

1. Outcome Target

Percentage of farm and ranch owners/operators and allied industry professionals participating in the program gaining knowledge of crop and varietal selection factors and research-based performance data

2. Outcome Type : Change in Knowledge Outcome Measure

2008 :60 **2009 :** 60 **2010 :** 60 **2011 :**60 **2012 :** 60

3. Associated Knowledge Area(s)

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

1. Outcome Target

Percentage of farm/ranch/landscaping owners/operators/managers and allied industry professionals participating in the program adopting improvements in cultural practices, pest and disease management, irrigation and drainage or other aspects of comprehensive management systems for plant and animal production

2. Outcome Type : Change in Action Outcome Measure

2008 :30 **2009 :** 30 **2010 :** 30 **2011 :**30 **2012 :** 30

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 307 - Animal Management Systems
- 604 - Marketing and Distribution Practices

1. Outcome Target

Percentage of farm, ranch and landscaping owners/operators and managers and allied industry professionals participating in the program adopting superior varieties of crops

2. Outcome Type : Change in Action Outcome Measure

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

3. Associated Knowledge Area(s)

- 204 - Plant Product Quality and Utility (Preharvest)

1. Outcome Target

Percentage of farmers and ranchers participating in the program realizing lower production costs and/or increased economic sustainability

2. Outcome Type : Change in Condition Outcome Measure

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

3. Associated Knowledge Area(s)

- 601 - Economics of Agricultural Production and Farm Management
- 604 - Marketing and Distribution Practices

1. Outcome Target

Percentage of farm/ranch/landscaping owners/operators/managers and allied industry professionals participating in the program gaining knowledge of cultural practices, pest and disease management, irrigation and drainage or other aspects of comprehensive management systems for plant and animal production

2. Outcome Type : Change in Knowledge Outcome Measure

2008 :	**2009 :**	**2010 :**	**2011 :**	**2012 :**
45	45	45	45	45

3. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 302 - Nutrient Utilization in Animals
- 307 - Animal Management Systems
- 601 - Economics of Agricultural Production and Farm Management
- 604 - Marketing and Distribution Practices

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
- Populations changes (immigration,new cultural groupings,etc.)

Description

{NO DATA ENTERED}

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

1. Evaluation Studies Planned

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

Description

{NO DATA ENTERED}

2. Data Collection Methods

- Sampling
- Whole population
- Mail
- Telephone
- On-Site
- Structured
- Unstructured
- Case Study
- Observation
- Tests
- Journals
- Other (Web Surveys)

Description

{NO DATA ENTERED}

V(A). Planned Program (Summary)

1. Name of the Planned Program

Sustaining California's Natural Resources

2. Brief summary about Planned Program

UC ANR's integrated research and extension activities will address issues related to sustaining California's natural resources over the long term while continuing to provide products, recreation and habitat for the state. ANR programs will focus on water and air quality, land use, water supply and allocation, wildland fire, and the sustainable use of California's natural resources. Priority areas for research and extension include

· ·Water Quality: biological and physical aspects of water quality, the economic and social activities that affect water quality and solutions to prevent or mitigate water quality problems.

· Air Quality: biological and physical aspects of air quality, including sources, characteristics, movement and mitigation or prevention of air quality problems.

· Land Use: biological, economic, social and physical aspects of land use, including urban and rural uses and trends, characteristics of land use planning and policy approaches and issues, mitigation or prevention of land-use related problems.

· Sustainable Use of Natural Resources: biological, economic, social and physical aspects of the sustainability of natural resources in California, including management practices that promote ecological sustainability along with economic opportunity on a landscape scale, characteristics of natural resources-use planning policy approaches and issues, mitigation or prevention of natural resource use related problems.

· Water Supply and Allocation: biological and physical aspects of water supply and allocation and the economic, political and social activities that affect water supply and allocation and solutions to water supply and allocation problems.

· Wildland Fire: biological, ecological and physical aspects of wildland fire and the economic, political and social activities that affect wildland fire and solutions to wildland fire problems.

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

101	5%	Appraisal of Soil Resources
102	11%	Soil, Plant, Water, Nutrient Relationships
103	2%	Management of Saline and Sodic Soils and Salinity
111	7%	Conservation and Efficient Use of Water
112	9%	Watershed Protection and Management
121	4%	Management of Range Resources
122	2%	Management and Control of Forest and Range Fires
123	3%	Management and Sustainability of Forest Resources
131	1%	Alternative Uses of Land
132	4%	Weather and Climate
133	12%	Pollution Prevention and Mitigation
135	14%	Aquatic and Terrestrial Wildlife
136	2%	Conservation of Biological Diversity
141	2%	Air Resource Protection and Management
206	3%	Basic Plant Biology
212	6%	Pathogens and Nematodes Affecting Plants
305	3%	Animal Physiological Processes
311	2%	Animal Diseases
605	7%	Natural Resource and Environmental Economics
610	1%	Domestic Policy Analysis

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

1. Situation and priorities

Population growth continues to increase demands on California's natural resources. Issues involving natural resources are far ranging, from urban areas to wildlands, and from aquatic to terrestrial ecosystems. The Natural Resource Program focuses on several areas that are key to the sustainable use of natural resources in California.

Water Quality: California had over 600 water bodies listed as impaired under the federal Clean Water Act of 1972 based on the 2002 Section 303(d) list. Identified contaminants that impair water quality, affect ecosystem health and potentially threaten human health include nutrients, pesticides, sediment and bacteria. Temperature and sediment threaten spawning and rearing habitat for aquatic species, such as salmon, and degradation of riparian habitat compound these impairments to beneficial uses derived from clean water. Air Quality: The negative impacts of air pollution include crop injury, global warming, plant and animal biodiversity shifts, human health impairment and others. Generation of particulate matter (PM) and photoxidant gases from farming and livestock operations can be significant contributors to air pollution, including ozone generation, reducing crop yields, impairing human health and contributing to other environmental impacts. Land Use: California is the most diverse, populous and rapidly growing state. It leads the nation in the value of diversity of agriculture and the diversity of ecosystems. As a result, land us conflicts are frequent throughout the state. Land use decisions can, and have, resulted in loss of plant and animal species, open space and wildlife, deterioration of water quality, increased dispersal of invasive species, and habitat fragmentation. Sustainable Use of Natural Resources: Incorporation of approaches that maintain critical ecosystem conditions on a landscape scale over the long term while providing products, recreation and habitat is critical for California. Sustaining diverse ecosystems while meeting societal needs and desires is at the core of this area. Water Supply and Allocation: California's prosperity is tied to effective management of available water for the values and benefits held by its citizenry. Proposed development, population growth, agricultural production, and ecosystem sustainability in California are dependent upon reliable sources of high quality water. Wildland Fire: Wildland fire management systems require many approaches based upon a greater understanding of fire behavior, the ecological role of fire in natural systems, ecosystem health, and fire suppression strategies. Fire and fuels management directly affect water and air quality, and have impacts on habitat, invasive species spread, and other ecosystem functions

2. Scope of the Program

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

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

1. Assumptions made for the Program

Continuation of funding (public and private) at current or higher levels.
Continuation of agency and organization collaboration at current or higher levels.
Availability of personnel to be appointed to new and/or vacated Agricultural Experiment Station and Cooperative Extension positions.
Natural resource related policies and regulations (local, state, federal) which allow for management of natural resources based upon scientific information, concepts and knowledge.

2. Ultimate goal(s) of this Program

Increased clean water, environmental health and high functioning aquatic, coastal, marine and riparian habitats.
Reduction in the number of impaired water bodies throughout California.
Significant and measurable improvement in air quality in California.
Improved health of Californians suffering from air quality related health problems.
Improved agricultural productivity linked to improved air quality.
Reduced incursions of invasive species in urban and rural settings.
Increased biodiversity.
Cleaner air, soil and water associated with improved land use and natural resource use practices.
Increased area of sustainable open space and natural habitats for the environment, recreation and wildlife.
Economic growth and productivity of the natural resource based industries in California.
Reduced natural resource system failure and related economic, environmental and social losses.
Sufficient water supplies for sustaining California's growing population, agricultural viability and ecosystem needs.

Reduction in the failure of water supply and allocation systems and related economic, environmental and social costs.
Decrease in the number of acres burned by wild fires.

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	63.5	0.0	82.3	0.0
2009	63.5	0.0	82.3	0.0
2010	63.5	0.0	82.3	0.0
2011	63.5	0.0	82.3	0.0
2012	63.5	0.0	82.3	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

UC ANR's integrated research and extension activities will conduct research projects, workshops, education classes and demonstrations as well as one-on-one interventions. In addition, the programs will use PSAs, newsletters, mass media, web sites and collaborations with other agencies and organizations to create and deliver programs.

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

Extension	
Direct Methods	**Indirect Methods**
• One-on-One Intervention • Group Discussion • Demonstrations • Education Class • Workshop	• Web sites • Newsletters • Other 1 (Collabs w/other agencies/orgs) • TV Media Programs • Public Service Announcement

3. Description of targeted audience

Farmers
Ranchers
Marine industry owners/operators
Governmental agencies
Agricultural and fishing organizations
Owners/managers of private and public rangeland, forest and wildlands
Community organizations
Resource managers

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	69000	0	0	0
2009	69000	0	0	0
2010	69000	0	0	0
2011	69000	0	0	0
2012	69000	0	0	0

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

Expected Patent Applications

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

3. Expected Peer Review Publications

Year	Research Target	Extension Target	Total
2008	430	0	0
2009	430	0	0
2010	430	0	0
2011	430	0	0
2012	430	0	0

V(H). State Defined Outputs

1. Output Target

- Classes/Short Courses Conducted

  2008 : 110 **2009 :** 110 **2010 :** 110 **2011 :** 110 **2012 :** 110

- Workshops Conducted

  2008 : 130 **2009 :** 130 **2010 :** 130 **2011 :** 130 **2012 :** 130

- Demonstrations and Field Days Conducted

  2008 : 120 **2009 :** 120 **2010 :** 120 **2011 :** 120 **2012 :** 120

- Newsletters Produced

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

- Web Sites Created or Updated

  2008 : 25 **2009 :** 25 **2010 :** 25 **2011 :** 25 **2012 :** 25

- Research Projects Conducted

2008 :250 **2009 :**250 **2010 :** 250 **2011 :**250 **2012 :**250

- Videos, Slide Sets and Other AV or Digital Media Educational Products Created

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

- Manuals and Other Printed Instructional Materials Produced

2008 :80 **2009 :**80 **2010 :** 80 **2011 :**80 **2012 :**80

V(I). State Defined Outcome

1. Outcome Target

Percentage of farm, ranch and rangeland and marine industry owners/operators and managers and allied industry professionals participating in water quality education gaining knowledge of best management practices for preserving water quality

2. Outcome Type : Change in Knowledge Outcome Measure

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

3. Associated Knowledge Area(s)

- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 121 - Management of Range Resources
- 133 - Pollution Prevention and Mitigation

1. Outcome Target

Number of governmental agencies, agricultural and fishing organizations, resource managers and other stakeholders in marine and inland fishery management issues gaining knowledge of strategies and techniques for sustainable use of marine and inland fishery resources.

2. Outcome Type : Change in Knowledge Outcome Measure

2008 :1500 **2009 :** 1500 **2010 :** 1500 **2011 :**1500 **2012 :** 1500

3. Associated Knowledge Area(s)

- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 133 - Pollution Prevention and Mitigation
- 135 - Aquatic and Terrestrial Wildlife

1. Outcome Target

Percentage of owners/managers of private and public rangeland, forest and wildlands participating in range, forest and wildland education gaining knowledge of strategies and techniques for sustainable use of range, forest and wildland resources

2. Outcome Type : Change in Knowledge Outcome Measure

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

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

- 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
- 206 - Basic Plant Biology

1. Outcome Target

Number of governmental agencies, community organizations and other stakeholders in land use policy issues gaining increased understanding of land use planning strategies, methodologies and data

2. Outcome Type : Change in Knowledge Outcome Measure

2008 :	**2009 :**	**2010 :**	**2011 :**	**2012 :**
600	600	600	600	600

3. Associated Knowledge Area(s)

- 131 - Alternative Uses of Land
- 136 - Conservation of Biological Diversity
- 610 - Domestic Policy Analysis

1. Outcome Target

Percentage of farm, ranch and rangeland and marine industry owners/operators and managers and allied industry professionals participating in water quality education adopting best management practices for preserving water quality

2. Outcome Type : Change in Action Outcome Measure

2008 :	**2009 :**	**2010 :**	**2011 :**	**2012 :**
40	40	40	40	40

3. Associated Knowledge Area(s)

- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 133 - Pollution Prevention and Mitigation

1. Outcome Target

Percentage of owners/managers of private and public rangeland, forest and wildlands participating in range, forest and wildland education adopting recommended strategies and techniques for sustainable use of range, forest and wildland resources

2. Outcome Type : Change in Action Outcome Measure

2008 :	**2009 :**	**2010 :**	**2011 :**	**2012 :**
40	40	40	40	40

3. Associated Knowledge Area(s)

- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 121 - Management of Range Resources
- 122 - Management and Control of Forest and Range Fires
- 123 - Management and Sustainability of Forest Resources
- 131 - Alternative Uses of Land
- 133 - Pollution Prevention and Mitigation
- 135 - Aquatic and Terrestrial Wildlife

- 136 - Conservation of Biological Diversity

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
- Populations changes (immigration,new cultural groupings,etc.)

Description

{NO DATA ENTERED}

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

1. Evaluation Studies Planned

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

Description

{NO DATA ENTERED}

2. Data Collection Methods

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

Description

{NO DATA ENTERED}