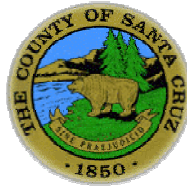


# University of California Cooperative Extension Santa Cruz County Year 2004 Report



---

**University of California Cooperative Extension  
Santa Cruz County  
Year 2004 Report**

---

**Table of Contents**

<b>Introduction</b>	<b>2</b>
<b>University Academic Staff</b>	<b>3</b>
<b>University Research/Support Staff</b>	<b>4</b>
<b>County Administrative Staff</b>	<b>4</b>
<b>Summary Workload Statistics</b>	<b>5</b>
<b>Funding Sources</b>	<b>6</b>
<b>Santa Cruz County Advisor Program Reports</b>	<b>7</b>
<b>Mark P. Bolda – Strawberries &amp; Caneberries</b>	<b>8</b>
<b>Lynn Schmitt-McQuitty – Youth Development</b>	<b>12</b>
<b>Richard M. Starr – Marine Science</b>	<b>17</b>
<b>Steven A. Tjosvold – Environmental Horticulture</b>	<b>21</b>
<b>Laura Tourte – Farm Management &amp; Small Farms</b>	<b>26</b>

---

# Introduction

The University of California Cooperative Extension (UCCE), is a cooperative county, state and federal activity authorized by the Federal Smith-Lever Act. It serves as the link to the Land Grant University System by conducting applied research, education, and outreach activities that focus on areas of importance within local communities. It is administered at the state and federal levels through the Division of Agriculture and Natural Resources (ANR) of the University of California and at the local level through the County of Santa Cruz.

Within Santa Cruz County, our mission and goals are to support, protect, and improve the resources and quality of life by providing research-generated knowledge and information in the following major program areas:

- Agricultural Resources
- Natural Resources
- Human Resources

Within each major program area we conduct multiple applied research projects; sponsor, convene, and coordinate educational events; and perform outreach activities for diverse groups. We also work closely with other governmental agencies, local non-profit organizations, industries, and businesses to provide information and assistance in support of our mission and goals.

## ***AGRICULTURAL RESOURCES – PROGRAM REPORT/FOCUS AREA:***

***I. SUPPORT AND STRENGTHEN THE AGRICULTURAL INDUSTRY.*** Core issues within this focus area include integrated pest management and invasive species, farm profitability, sustainability, organic farming, marketing, regulatory pressures, and pressures at the agricultural-urban interface.

## ***NATURAL RESOURCES – PROGRAM REPORT/FOCUS AREA:***

***II. PROTECT, CONSERVE, AND ENCOURAGE THE WISE USE OF NATURAL RESOURCES.*** Core issues within this focus area include water quality and the Monterey Bay National Marine Sanctuary, marine protected areas, socioeconomics of fisheries, land-sea linkages, farm water quality, and Sudden Oak Death.

## ***HUMAN RESOURCES – PROGRAM REPORT/FOCUS AREA:***

***III. EDUCATE AND SUPPORT THE HEALTHY DEVELOPMENT OF YOUTH AND FAMILIES.*** Core issues within this focus area include the use of science and technology to help youth develop leadership, citizenship, and life skills, access to quality after-school educational programs and childcare, high-risk behaviors in youth, and nutrition education.

# **University Academic Staff**

## ***ADVISORS IN SANTA CRUZ COUNTY***

<b>Laura Tourte</b>	<b>County Director &amp; Farm Management Advisor</b>
<b>Mark Bolda</b>	<b>Strawberry &amp; Caneberry Advisor</b>
<b>Lynn Schmitt-McQuitty</b>	<b>Youth Development Advisor</b>
<b>Richard M. Starr</b>	<b>Sea Grant/Marine Advisor</b>
<b>Steven A. Tjosvold</b>	<b>Environmental Horticulture Advisor</b>

## ***ADVISORS IN MONTEREY COUNTY WITH CROSS COUNTY ASSIGNMENTS TO SANTA CRUZ COUNTY***

<b>Larry J. Bettiga</b>	<b>Viticulture Advisor</b>
<b>Michael Cahn</b>	<b>Water Resources &amp; Irrigation Advisor</b>
<b>William E. Chaney</b>	<b>Entomology Advisor</b>
<b>Steven T. Koike</b>	<b>Plant Pathology Advisor</b>
<b>Richard Smith</b>	<b>Weed Science &amp; Vegetable Advisor</b>

## ***ADVISORS IN SAN BENITO COUNTY WITH CROSS COUNTY ASSIGNMENTS TO SANTA CRUZ COUNTY***

<b>William W. Coates</b>	<b>Tree Crops &amp; Pomology Advisor</b>
<b>Sergio Garcia</b>	<b>Livestock &amp; Range Science Advisor</b>

## ***ADVISORS IN SANTA CLARA COUNTY WITH CROSS COUNTY ASSIGNMENTS TO SANTA CRUZ COUNTY***

<b>Aziz Baameur</b>	<b>Small Farm Advisor</b>
---------------------	---------------------------

## **University Research/Support Staff**

**David Chambers**

**Staff Research Associate**

**Mary Cross**

**4-H Program Representative**

**Kathleen Nolan**

**Nutrition Education Coordinator  
(Headquartered at UCCE Monterey County)**

## **County Administrative Staff**

**Judy Bettencourt**

**Division Secretary**

**Robin Friedman**

**Clerk III**

## Summary Workload Statistics - 2004

### Education & Outreach

• Workshops, Short Courses, Conferences, Field Days	149
• Consultations (Field, Office, Phone, E-Mail)	1,178
• News Releases & Mass Media	70
• Publications Distributed	2,183
• Newsletters Mailed	12,162

### Volunteer Programs

#### *Master Gardeners Program*

• Master Gardener Volunteers	125
• Master Gardener Hotline Hours	696
• Master Gardener Community Service & Project Hours	5,549

#### *4-H Youth Program*

• 4-H Clubs in Santa Cruz County	13
• 4-H Club Youth Members	326
• 4-H Adult Volunteers	134
✓ Years of Service for Adult Volunteers (range)	1-27
• Number of Projects with Enrolled Youth	61
• Five Most Popular Projects by Enrollment	
✓ Aerospace and Rocketry	78
✓ Creative Arts, Crafts and Hobbies	65
✓ Foods and Nutrition	61
✓ Camping and Outdoor Activities	58
✓ Horses and Ponies	56
• 4-H Community Service & Project Hours – Youth	6,018
• 4-H Community Service & Project Hours – Adults	1,442

# Funding Sources – Fiscal Year 2003-2004

## University of California (State) & Federal Funds

• Direct & Indirect	\$812,257
• Competitive & Non-Competitive Funds	<u>421,902</u>
<b>Total University &amp; Federal Funds</b>	<b>\$1,234,159</b>

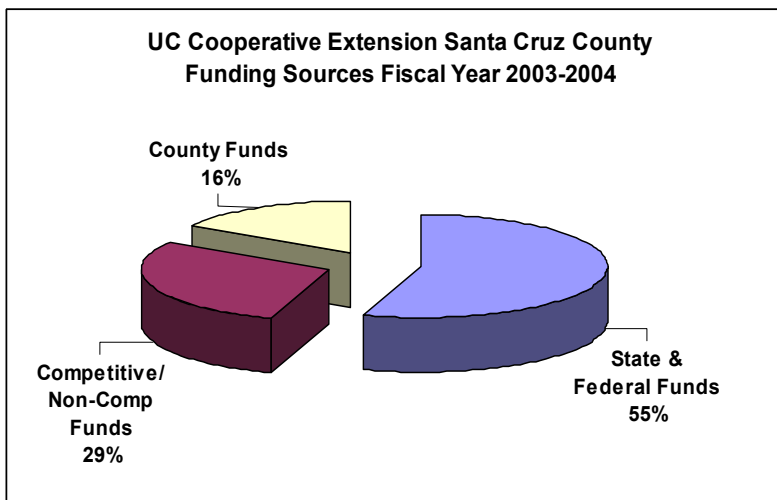
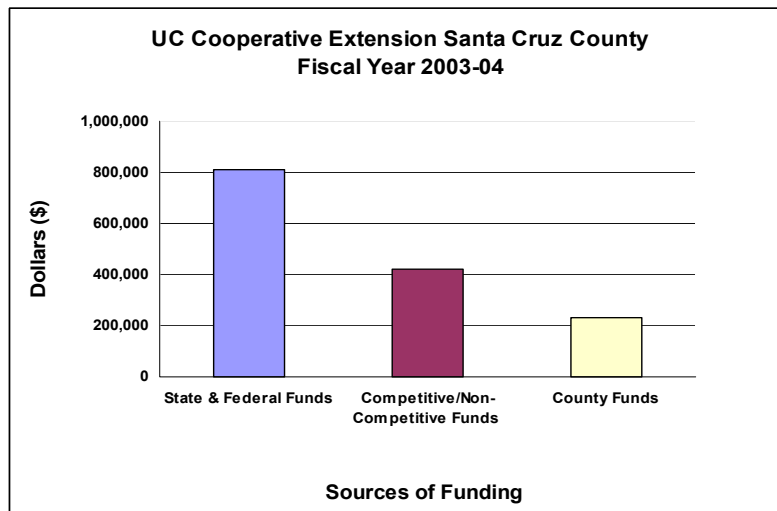
## County of Santa Cruz Funds

• Direct & Indirect	\$229,470
<b>Total County Funds</b>	<b>\$229,470</b>

## Total Funding

• University, Federal, & County	<b>\$1,463,629</b>
---------------------------------	--------------------

<b>University &amp; Federal Funds as a Percent of Total</b>	<b>84%</b>
<b>County Funds as a Percent of Total</b>	<b>16%</b>



**University of California Cooperative Extension  
Santa Cruz County**

**2004 Advisor Program Reports**



**MARK P. BOLDA                      STRAWBERRY & CANEBERRY ADVISOR (100% FTE)  
SANTA CRUZ, MONTEREY &  
SAN BENITO COUNTIES  
YEARS IN COUNTY – 3**

***PROGRAM DESCRIPTION***

Farm Advisors at the University of California Cooperative Extension (UCCE) conduct education and applied research programs to support and strengthen farmers and local agricultural industries. Strawberry and Caneberry Farm Advisor Mark Bolda uses a multifaceted approach to accomplish this in the tri-county region composed of Santa Cruz, Monterey, and San Benito Counties. In cooperation with farmers, other scientists, organizations, and agencies, Advisor Bolda works in the following areas:

- Plant fertility, irrigation, and pest management.
- Enhancement of fruit yield and quality.
- New markets and venues for berries, including organic and extended season production.

***SITUATION STATEMENT***

Strawberries and caneberries (raspberries and blackberries) are commodities for which production acreage and volume has expanded in California—notably in the three counties served by this program. This expansion is fueled in part by increased consumer demand. Fresh strawberries for this area constitute approximately 40% of the state's total production, significantly contributing to the \$1 billion industry. Local growers and shippers are well positioned to meet increased demand for caneberries because many of the same practices and equipment can be used for both types of berry operations. Producers of strawberries and caneberries range from large, sophisticated operations of international scale to small growers of only a few acres shipping and selling exclusively to local markets.

***PROGRAM REPORT/FOCUS AREAS***

***I. SUPPORT AND STRENGTHEN THE AGRICULTURAL INDUSTRY***

***A. Pruning Practices for Enhancement of Raspberry Yield***

*Description.* It is standard practice for raspberry growers to remove the first flush vegetative cane, called primocane, in the early spring to allow the plant to allocate more resources to the upcoming fruit crop in late spring and mid-summer. This removal is most often done using mechanical techniques, flaming, or targeted applications of herbicides. The removal process is not selective, and can destroy some fruiting cane along with the vegetative cane.

*Results/Impacts.* Research conducted in 2004 demonstrated that selectively removing only vegetative (primocane) by hand can significantly improve crop yield. This

information is useful for growers because it demonstrates an alternative method for enhancing fruit yield in raspberries. Further expanded research is planned for 2005.

**B. *Integrated Pest Management (IPM) for Twospotted Spider Mites in Macro-tunnels***

*Description.* Macro-tunnels, also known as high plastic tunnels, are used to increase yield and/or accelerate production in raspberries. These tunnels can, however, increase populations, thus problems, with the agricultural pest twospotted spider mite, probably because of the warm, protected conditions. Few efficacious miticides are currently registered for use in raspberries.

*Results/Impacts.* During 2004 Bolda conducted research using several registered and experimental miticides for both organic and conventional systems by testing different mite control materials, rates, and times of application. Some materials were identified as being better suited to IPM than others. Research on this aspect of the project will continue in 2005.

*Description.* Another consideration for macro-tunnel production is current methods of biological control. *Phytoseiulus persimilis*, a predator of twospotted spider mites, might not be able to function as effectively in the higher temperatures (20 degrees above the ideal *P. persimilis* activity range) found inside macro-tunnels. In 2004, two other species of predatory mites suited to activity in warmer conditions, *Metaseiulus occidentalis* and *Neosilis californicus* were tested.

*Results/Impacts.* Neither *M. occidentalis* nor *N. californicus* were found or recovered from test plots several weeks after release, indicating that they are not well suited to predation of twospotted spider mite when tested in these conditions. Future research to test these control agents under different conditions, and other agents as they become available, will continue in 2005.

**C. *Redberry Mite in Blackberries***

*Description.* The agricultural pest redberry mite is a microscopic mite that causes blackberry fruit to ripen insufficiently in an irregular pattern, leading to significant decreases in marketable yield. For farmers—especially small farmers—these yield losses are damaging economically.

*Results/Impacts.* In 2004, research was conducted in cooperation with local industry to identify more effective pesticide application schedules to maximize use efficacy, while also reducing application frequency, resulting in a reduced amount being applied to the crop. Several delayed application schedules were discovered, resulting in a significant reduction of pesticide applications and total amount used. Another important outcome of this research was that fruit yield significantly increased, presumably because of reduced blackberry plant stress from pesticide applications. This positively impacts marketable yield, thus income, for local farmers, and is particularly important for small farmers.

**D. *Blueberries as an Alternative to Strawberries and Caneberries***

*Description.* Blueberries are a potential important alternative crop to help growers achieve economic success in the Monterey Bay growing region. This region offers a 'competitive niche' for blueberries over other areas such as Oregon and Michigan given its temperate climate and timing of production. Blueberries have been grown in this area before, but with limited success, perhaps because varieties were not well adapted to the Monterey Bay area's lack of winter cold, or "chill" for plant conditioning. New varieties requiring low amounts of winter chill now offer growers the possibility of successfully growing blueberries in the Monterey Bay region.

*Results/Impacts.* Bolda is collaborating with other farm advisors, scientists and growers on a project evaluating 15 organically and conventionally grown blueberry varieties with potential for this area. Irrigation regimes and soil preparation techniques, including acidification, are part of this investigation. First year information was disseminated to growers and home gardeners in 2004, with research ongoing during 2005.

**II. *PROTECT, CONSERVE, AND ENCOURAGE THE WISE USE OF NATURAL RESOURCES*****A. *Nutrient Survey of Raspberries***

*Description.* Advisor Bolda is one of the few individuals within UCCE who has major responsibilities in caneberries. Very little information has been developed with respect to fertility guidelines and management for this production area. Indeed, guidelines for fertilizer applications and tissue nutrient targets currently used by Central Coast growers were originally formulated using data from other growing regions. The result has been consistent problems with fruit quality, and possible over or under-fertilization of the crop. Furthermore, this could lead to other unintended consequences including nutrient runoff and negative effects on the surrounding environment, such as ground and surface water nitrate contamination.

*Results/Impacts.* In 2004, Bolda investigated the nutritional status of several caneberry varieties as a resource ("benchmarks") for nutritional deficiency and research questions. Another study began to investigate optimum nutrition, especially that of nitrogen, for red raspberries grown along the Central Coast. The goal of this project is to develop an optimal fertility program for red raspberries, which will ultimately assist growers in making economically and environmentally sound decisions with respect to fertilizer applications.

**B. *Central Coast Farm Water Quality***

*Description.* UCCE and the USDA Natural Resources Conservation Service (NRCS) developed, and currently sponsor and coordinate, Farm Water Quality Short Courses along the Central Coast of California. These short courses are educational efforts that are convened to assist growers of irrigated crops in adapting resource conservation practices to their individual operations. They also assist growers in complying with new water quality regulations set forth by the State Water Quality Control Board.

*Results/Impacts.* Farm Advisor Bolda participated in four Farm Water Quality Short Courses, including one in the Spanish language, presenting information on

environmentally sound management of fertilizers and nutrients in berry crops. A total of 133 growers attended these courses. Bolda also assisted colleague Laura Tourte by translating presentation materials on costs and benefits of installing, maintaining and operating conservation practices into Spanish so that the information could be presented to Spanish speaking growers.

### ***Summary of Educational Accomplishments***

Advisor Bolda's program has a strong educational component to strengthen the knowledge and practices of growers and others working in the small fruit industries. Events and activities are made available to all who wish to attend. Bolda's work includes:

- Sponsored/convened three grower/industry research/educational meetings (with over 400 attendees total).
- Presented research information on IPM and various aspects of pest management at nine meetings targeted to both English and Spanish speaking audiences (with over 600 attendees total).
- Presented research information on soil fertility and various aspect of nutrient management for 'best management practices' and water quality at four meetings targeted to both English and Spanish speaking audiences (with over 100 attendees total).
- Presented research-based information to home gardeners on all aspects of strawberry and caneberry production (with 32 people in attendance).
- Worked with local community and presented information on research related to blueberry production for the three-county coastal area (with 16 people in attendance).
- Wrote 13 articles for newsletters, ranging in topics from IPM to the causes of misshapen strawberries.

### ***AFFIRMATIVE ACTION***

Affirmative action efforts are directed towards minority growers and Pest Control Advisors (PCA's) in strawberries and caneberries. This group is composed of mostly Hispanic farmers and industry personnel, with my efforts greatly facilitated by fluency in Spanish speaking, listening, reading, and writing. Educational activities are often offered in both English and Spanish, as are many written materials. All research and extension work is conducted with attention towards groups which may have been underserved in the past.

**LYNN SCHMITT-  
MCQUITTY**

**YOUTH DEVELOPMENT ADVISOR (100% FTE)  
SANTA CRUZ & MONTEREY COUNTIES  
YEARS IN COUNTY - 4**

***PROGRAM DESCRIPTION***

Youth Development Advisors at the University of California Cooperative Extension (UCCE) work to develop leadership, citizenship, and life skills for youth. Advisor Lynn Schmitt-McQuitty's program embraces multi-disciplinary methods of working with youth, educators, and associated organizations in the local communities of Santa Cruz and Monterey Counties. Work is also geared towards coordination with other UCCE programs in neighboring counties. For 2004, major themes and goals were:

- Conduct applied research, outreach and leadership in the areas of science, technology, environmental stewardship and natural resource education for youth in Santa Cruz and Monterey Counties.
- Serve as an educational resource by providing local leadership and knowledge of youth development, science, technology, environmental stewardship and natural resource education through collaboration with local youth and community groups.
- Extend knowledge and information to the Santa Cruz and Monterey County 4-H community club programs and staff.

***SITUATION STATEMENT***

The focus of the youth development activities in Santa Cruz and Monterey Counties is on integrating issues related to coastal resources, the environment, and agriculture with human and community development. Specifically, this program provides applied research, outreach and leadership in the areas of science, technology, environmental stewardship and natural resource education for youth.

According to the 2000 results of the nationwide science test by the National Center for Education Statistics, California fourth and eighth grade students scored 50th out of all 50 states in their academic achievement in science. Determining how California K-8 grade students are progressing in achieving science literacy is difficult due to the fact that California schools do not participate in National science testing until grade nine. With the strong emphasis on preparing students in language arts, little if any time is left for the development of science literacy. Through conducting applied research and developing partnerships, the UCCE Youth Development program is filling the science niche for many elementary aged students in the Santa Cruz County.

## ***PROGRAM REPORT/FOCUS AREAS***

### ***I. SUPPORT AND STRENGTHEN THE AGRICULTURAL INDUSTRY***

#### ***A. Teams With Intergenerational Support (TWIGS)***

*Description.* Teams With Intergenerational Support (TWIGS) focuses on the connection between gardening and healthy food choices for children. Thirty hands-on lessons in this 125-page curriculum are designed to partner children with teachers from different generations (teenagers, young adults, and senior citizens). Lessons provide children with opportunities to use the garden as a learning tool for connecting children with science, nutrition, reading, writing, social studies, art, gardens and community beautification.

*Results/Impacts.* In 2004, five adults and three Santa Cruz County teens were trained in the TWIGS curriculum. The trainers provided over 20 hours of hands-on gardening and nutrition education to over 40 youth. By participating in the TWIGS program, young people are connected to and part of the agricultural community by becoming growers of healthy foods. Evaluation data from program sites indicate an increase in attendance, positive attitudes, and participants talking about and sharing their learning with others.

Site directors indicate that children were more aware of environmental issues and the importance of maintaining a clean and safe environment due to the implementation of the TWIGS program. The implementation of the TWIGS curriculum also provided a more structured and successful summer program.

### ***II. PROTECT, CONSERVE, AND ENCOURAGE THE WISE USE OF NATURAL RESOURCES***

#### ***A. Youth Experiences in Science Program***

*Description.* Youth Experiences in Science (YES) uses specially trained teenage volunteers to conduct the hands-on science curriculum for children five to eight years of age. The YES curriculum incorporates cross-age teaching and inquiry-based activities with cooperative learning. The main objectives are: 1) to provide teens with authentic learning environments to develop leadership and life skills, 2) to provide younger children with hands-on science exploration activities, and 3) to enhance science literacy among teens and younger children.

*Results/Impacts.* In 2004, three adults and fourteen Santa Cruz County teens were trained to deliver and implement the Snails and Bubbles units of the YES curricula at MacQuiddy Elementary school in Watsonville and at three Mid-Peninsula Housing activity sites. The teens taught hands-on science activities to 160 school-aged children over a six and eight week period.

Site directors providing the YES program indicate an increase in student academic performance, greater interest in science, and positive learner attitudes among participants. Furthermore, the site directors note an increase in self-confidence,

improved problem solving techniques, and increased positive attitudes among the teen teachers.

**B. *SEA Guides Junior Leadership Program***

*Description.* The SEA Guides Junior Leadership program utilizes marine science to develop leadership, citizenship and life skills for youth ages 14 to 18. SEA Guides teach marine science lessons, facilitate camp activities, and help campers explore the marine environment through hikes, kayaking, and whale watching.

*Results/Impacts.* In 2004, seven teens were trained as SEA Guides, and guided over 234 campers in hands-on marine science field studies.

As a result of the SEA Guides program, teens have developed knowledge, attitudes and skills in the areas of marine science education, working with young people, and further development of their leadership and citizenship skills.

**III. *EDUCATE AND SUPPORT THE HEALTHY DEVELOPMENT OF YOUTH AND FAMILIES***

**A. *Together For Youth Collaborative: Local Down Low Project***

*Description.* Together For Youth is a community collaborative representing members of public and private health and human service organizations, schools, the juvenile justice system, community members, parents and youth. The Local Down Low project [www.localdownlow.com](http://www.localdownlow.com) developed a website by youth, for youth to link to events and services in Santa Cruz County.

*Results/Impacts.* In 2004 a part-time coordinator was hired to focus on this project. The role of the coordinator was to identify local teens as “roving reporters” to write articles on youth-related resources and information on volunteer opportunities, employment, entertainment ideas, health, and related information. The coordinator also worked with teens to design and evaluate the website.

As a result of this project, youth and youth organizations have a one-stop resource for the identification of volunteer opportunities, employment, entertainment ideas, health, and related information throughout Santa Cruz County. The website has also provided youth with an opportunity to take advantage of leadership training and volunteer opportunities.

**B. *Afterschool Workgroup: Life Skills Project***

*Description.* By conducting an applied research project in Santa Cruz and Los Angeles County afterschool programs that serve diverse at-risk youth, we will determine how encouraging life and academic skill development can improve academic success.

*Results/Impacts.* The results of this project will position California to be a leader in researching how encouraging life and academic skill development can improve academic success. The results will have the potential to influence program content and

delivery methods in afterschool programming, and will provide educators with tools and resources to implement life skills in order to improve academic outcomes.

By taking the lead in this nationally identified need, Santa Cruz County will produce research that identifies how the inclusion life skill development in afterschool programming can improve academic outcomes in youth.

**C. *Experiential Learning Training and Design***

*Description.* The aim of the experiential learning project is to enhance and deepen the use and understanding of experiential learning among educators, through participation in a three-step workshop program. Workshops are designed in a sequence that scaffolds experiential learning concepts. Each workshop ranges in length from two to three hours and provides participants with practical, real-world experiences to enhance their understanding, application and evaluation of experiential learning. Workshop I: Designing Experiential Learning Modules focuses on learners' understanding and application of Experiential Learning and the Learning Cycle. Workshop II: Inquiry-Based Learning and the Experiential Learning Cycle introduces inquiry-based learning, making a distinction between hands-on experiential learning and hands-on experiential learning using inquiry. Workshop III: Developing and Adapting Curricula to Integrate Experiential Learning, engages participants in evaluating existing curricula to determine if they utilize experiential learning and/or inquiry methods.

*Results/Impacts.* Workshop modules have been tested with 4-H volunteer leaders, afterschool child care providers, and classroom teachers throughout California. Post-training survey data indicates ninety-four percent (N=127) of participants indicated they had learned information on experiential learning that they could use in their programs or classrooms as a result of their participation in the workshops. Four to six-month follow-up survey data indicates that sixty percent (N=40) of the participants had changed their teaching practices by using ideas they had learned in the experiential learning workshops.

Locally 12 adult volunteers in the Santa Cruz County 4-H program have been trained utilizing the experiential learning model. Participants have been encouraged to work on modifying their teaching techniques and strategies to more fully incorporate the learning model into their activity lessons. These volunteers are poised to become key contacts and leaders within the program, as they gain additional awareness, knowledge and skill in delivering the learning model.

**D. *Santa Cruz County 4-H Community Club Program***

*Description.* The Santa Cruz County 4-H Community Club program engages youth in reaching their fullest potential while advancing the field of youth development. The program is based on a proven experiential learning model that creates an educational climate through planned learning, exploring and receiving feedback. The program is conducted with a youth development framework emphasizing citizenship, leadership and life skills.



*Results/Impacts.* In 2004, the Santa Cruz County 4-H Community Club program consisted of 13 clubs which served 323 youth ages seven to 18 and 132 adult volunteers engaging in 61 educational learning projects.

### ***AFFIRMATIVE ACTION***

Affirmative action is included in my program outreach objectives, and is a component in my program planning, implementation and evaluation.

#### *County-based Youth Development Programs*

The focus of my county-based youth development programs have been in providing science, technology, environmental science and natural resource program resources, outreach and leadership to underserved communities and populations, which has taken place through my Youth Community Science Education Program.

The Youth Community Science Education programs take place in locations where there are not community 4-H club programs, and in communities that are ethnically varied. This was a deliberate decision in an effort to not only expand the scope and location of the program, but to also increase the diversity of young people involved with the program.

As a result, traditionally underserved communities in Santa Cruz County are now connected to the University of California 4-H Youth Development Program and participated in over 80 hours of science-based instruction led by local educators in 2004.

#### *Santa Cruz County 4-H Community Club Program*

As part of the annual beginning of the year paper work that is required of all community clubs, I have developed an "Affirmative Action Narrative Plan" reporting form that each club is required to complete. The plan is used as a prompt to ensure that all clubs deliberately and purposefully plan and carry out "all reasonable efforts" according to UCCE Affirmative Action practices. These plans are reviewed for depth and appropriateness, and are used as a tool to measure follow-through of the all reasonable efforts reported by the club.

Continuing education beyond the start-up meeting is provided via monthly articles in Santa Cruz County 4-H News Letter entitled "Diversity and Inclusion." These articles highlight the various methods by which to conduct all reasonable efforts and provide suggestions and "Best Practices" from other 4-H clubs.

In addition, I have developed and provided training on an Affirmative Action resource packet for each Community Club in Santa Cruz County. The packet includes:

- Definitions of affirmative action, all reasonable efforts, and parity.
- Parity information for their specific club and community.
- English/Spanish member recruitment brochure.
- Volunteer recruitment brochure.
- Culture and learning style information from the "Strengthening Programs to Reach Diverse Audiences Curriculum."
- Bienvenidos al 4-H.
- Youth with Special Needs, Leaders Handbook "Making 4-H More Accessible".

**RICHARD M. STARR****MARINE ADVISOR (100% FTE)  
SANTA CRUZ & MONTEREY COUNTIES  
YEARS IN COUNTY – 13*****PROGRAM DESCRIPTION***

Marine Advisors at the University of California Cooperative Extension (UCCE) help identify and solve coastal and marine resource problems. We apply and transfer research information to solve practical problems for a wide variety of commercial and industrial businesses as well as recreation, education, and conservation user groups. During 2004 Marine Advisor Rick Starr worked in four primary areas. They were:

- Developing an ocean science camp for children.
- Helping promote and coordinate marine research and education in this region.
- Providing technical advice, training, and leadership to help governmental agencies, environmental organizations, and resource users develop and coordinate coastal resource management plans.
- Conducting research on fished species to help promote the wise use, conservation, and management of valuable fishery resources.

***SITUATION STATEMENT***

The focus of marine and coastal activities in Santa Cruz and Monterey Counties is on resource conservation, education, and the development of world-class marine research institutions. Tourism, recreation, research, and education are the primary marine related revenue generators in the local area. The existence of the Monterey Bay National Marine Sanctuary, the nation's largest marine sanctuary, provides a backdrop for these activities, and has brought a greater attention to the need for a high quality marine and coastal environment.

Fisheries are also important cultural and economic components of the coastal economy, but there have been major changes in fisheries management in the past five years, which are causing uncertainty in the fishing community. The current issues in fisheries revolve around the need to conserve fished populations and improve fishery management while maintaining viable commercial and recreational industries. Other pressing resource conservation issues include the decline in abundance of some non-harvested species, coastal development and habitat loss, degradation of water quality, user conflicts, and a need to maintain recreational opportunities. Additionally, there is a need for coordination of the many research, education, conservation, and recreation groups in this area.

**PROGRAM REPORT/ISSUE AREAS****II. PROTECT, CONSERVE, AND ENCOURAGE THE WISE USE OF NATURAL RESOURCES****A. Coordination of Researchers and Educators, and Public Education**

*Description.* There are more than 25 major research and educational institutions in the Monterey Bay Region that have a combined research budget of more than \$200 million. One of Starr's objectives is to help facilitate communication between the institutions and to encourage local researchers to work on applied topics of concern to local communities. Starr also synthesizes research publications and makes presentations to provide people with a clear understanding of natural resource and public policy issues.

*Results/Impacts.* Starr attends meetings and organizes workshops and symposia to discuss research and education in this region. Starr also frequently makes public presentations about natural resources and resource management, and writes publications oriented to a general audience.

**B. Facilitating Communication Between Scientists and the Fishing Industry**

*Description.* A cultural gap exists among fishermen, scientists, and resource managers. Rick Starr is facilitating and helping sponsor a series of workshops to bring scientists and fishermen together to discuss controversial marine resource management issues in a setting that fosters communication and sharing of ideas and information.

*Results/Impacts.* Results of this project help build trust and respect among the fishing industry, scientists, and resource managers.

**C. Providing Leadership and Advice for Sustainable Resource Management**

*Description.* In the late 1990s, the California Legislature enacted new laws requiring fishery management plans and investigation of alternative fishery management techniques. In response, resource managers are considering new methods for managing fisheries, such as the use of marine protected areas. Often, these new techniques are controversial and little is known about the efficacy of these new approaches. New information is needed with which to develop fishery management plans and to evaluate new management methods.

*Results/Impacts.* Rick Starr's research and outreach efforts are related to providing the scientific information needed to help evaluate new management approaches. An example of Starr's leadership is that he serves as a member of a statewide Science Advisory Panel that advises the Governor's Blue Ribbon Task Force on marine protected areas. Starr was chosen because of his expertise and publication record related to the science of marine reserves.

**D. Research on Marine Fish Species to Improve Management Practices**

*Description.* Many marine resources in California experienced a precipitous decline in abundance from 1980-2000, because of high exploitation rates and limited knowledge about life histories of marine species that are harvested. Marine Advisor Rick Starr conducts collaborative research with fishermen, scientists, and agency staff to improve

fish assessment techniques and learn more about population sizes, movements, and mortality of marine fishes.

*Results/Impacts.* In 2004, his research team used submersibles to survey rocky habitats in the Monterey Bay National Marine Sanctuary. From direct observations and video-tapes, they determined habitats used by different fishes and relative densities of fishes in each habitat. Data from observations were entered into database, statistical, and GIS programs and analyzed. Results of his research should help fishermen and resource managers develop management plans that lead to sustainable use of marine resources.

Much of Starr's research is intended to help evaluate the marine reserve concept as a tool for managing fisheries. Marine reserves may help conserve stocks of fish, but there are some critical variables that influence their effectiveness. For example, estimates of sizes of home ranges and frequency of movements of a species are vital elements to determining an appropriate design for a marine reserve that would help conserve that species. However, little is known about typical movements of many coastal species. To provide information about policy decisions related to marine reserves, Starr surgically implants sonic transmitters in fish to determine the home ranges and frequency of movements of key species.

#### ***Summary of Primary Accomplishments***

- Attended community meetings to discuss research activities.
- Wrote two short articles about natural resources for public distribution.
- Published three scientific articles about fish movements and marine reserves.
- Made three presentations about natural resource policy issues.
- Presented two lectures to Moss Landing Marine Labs graduate classes, one on historical fisheries ecology and one on modeling of fish populations in marine reserves.
- Served as a mentor for graduate students.
- Studied rockfish, lingcod, and grouper movements and habitat use.
- Present research results at the Western Groundfish Society Semi-Annual Meeting.
- Presented research results at the American Association for the Advancement of Sciences Annual Meeting.
- Presented research results at the 4<sup>th</sup> World Fisheries Congress.
- Conducted collaborative field research with west coast researchers.
- Led multi-institutional submersible research project to help develop long-term monitoring program for the Monterey Bay National Marine Sanctuary.

### ***III. EDUCATE AND SUPPORT THE HEALTHY DEVELOPMENT OF YOUTH AND FAMILIES***

#### ***A. Improving Science and Environmental Literacy of Our Youth***

*Description.* For the past two decades, the United States has experienced a well-documented decline in the quality of science education. Mean Scholastic Aptitude Test scores have declined for all ethnic groups, gender and racial differences in mathematics and sciences have increased, most schools have lost funds needed to keep up with new technologies and ideas, and as a result, teachers have experienced increasing difficulty

maintaining proficiency in science literacy. Rick Starr is leading a community group to improve youth science and environmental literacy.

*Results/Impacts.* Starr is chair of the Board of Directors of Camp SEA Lab, an ocean science camp for children. Camp SEA Lab is an outdoor, experiential learning program that provides children from a wide range of social and economic backgrounds with an appreciation for science, resource conservation, and marine related careers. In 2004, Camp SEA Lab provided five types of educational opportunities for children. We offered youth weekend workshops, family weekend workshops, teacher workshops, outdoor science camps for schools, and residential and day summer camps for youth.

***Summary of Camp SEA Lab Primary Accomplishments***

- Provided seven youth and family weekend workshops.
- Provided three teacher workshops to train educators in outdoor education techniques.
- Provided four outdoor science camps for school groups, lasting 3 days each.
- Provided five residential summer camps, each one week long.
- Provided five summer day camps, each one week long.
- Served more than 500 people.
- Made plans to serve 1,000 people in 2005 camp offerings.

***AFFIRMATIVE ACTION***

Marine users in the Monterey Bay region have little ethnic diversity. Over 95% of the clientele are Caucasian, and over 80% are males. Consequently, Rick Starr's first priority relative to Affirmative Action is to increase the involvement of women in science, education, and marine recreation. Although more than 80% of Starr's clientele are male, records show that 50% of the people he contacted from 2004 were women. The children that participated in Camp SEA Lab offerings in 2004 were an ethnically diverse group of Caucasians, Asian Americans, African Americans, and Latinos. Many of the children participating in Camp SEA Lab were provided scholarships because of their economic status. More than 200 children participating in Camp SEA Lab in 2004 were provided full or partial scholarships.

**STEVEN A. TJOSVOLD****ENVIRONMENTAL HORTICULTURE  
FARM ADVISOR (100% FTE)  
SANTA CRUZ & MONTEREY COUNTIES  
YEARS IN COUNTY – 22*****PROGRAM DESCRIPTION***

Farm Advisors at the University of California Cooperative Extension (UCCE) conduct education and applied research programs to support and strengthen farmers and local agricultural industries. Environmental Horticulture Farm Advisor Steve Tjosvold plans and implements educational and adaptive research programs in floriculture, nursery production, turf management, and landscape horticulture in Santa Cruz and Monterey Counties. Major themes of his research and education programs include:

- Integrated Pest Management (IPM) for the agricultural industry and the County of Santa Cruz.
- Research and education for *Phytophthora ramorum*, commonly known as Sudden Oak Death (SOD), for the County of Santa Cruz and the nursery industry.
- Oversight and direction of the local UCCE Monterey Bay Master Gardeners Volunteer Program.

***SITUATION STATEMENT***

California's horticultural industries are important components within the state's agricultural sector. The economic impact of local industry is significant, with flower and nursery production exceeding \$240,000,000 in 2003 in Santa Cruz and Monterey Counties.

California's landscape maintenance and installation industry is also a significant and important part of the local economy. It is a multi-billion dollar endeavor with over 86,000 people employed. The Monterey Bay region is noted for its many beautiful and varied state, county, and city parks and its home landscapes that are maintained by professional landscape gardeners. Programs developed for this program serve and benefit professional clientele working in public parks, private gardens and landscapes, and the landscapes of state and local municipalities.

***PROGRAM REPORT/ISSUE AREAS******I. SUPPORT AND STRENGTHEN THE AGRICULTURAL INDUSTRY******A. An Intra-crop Airflow System on Lisianthus***

*Description.* Lisianthus is an important high value cut flower crop. However, its production in California is threatened by *Botrytis*, a serious above-ground fungal pathogen. Lisianthus growers rely heavily on fungicides to control *Botrytis* and many fungicides that are currently available do not control the resistant greenhouse strains.

Moving air *within* a crop canopy has several potential positive affects on the crop: 1) It may control *Botrytis* by reducing moisture on leaves and stems, and 2) it may improve photosynthesis and therefore crop productivity by increasing the effectiveness of carbon dioxide uptake.

*Results/Impacts.* During 2003 and 2004, Advisor Tjosvold and colleagues conducted research on Lisianthus, where two custom designed and manufactured intra-canopy air circulation systems were installed in a commercial nursery. The systems reduced incidence of *Botrytis* stem and leaf blight by 38%. The plant canopy was kept drier for longer periods of time compared to control plots. In addition, flower stem height and fresh weight per flower stem were greater in air treated than in control beds. Advisor Tjosvold is continuing to take *Botrytis* and productivity data for this experiment. In the fall of 2004 research was expanded to include greenhouse cut roses.

#### **B. *Integrated Pest Management on Gerbera***

*Description.* This is a statewide research and demonstration project conducted with other colleagues. A Gerbera Alliance of growers, researchers, and industry representatives has been organized and UC IPM has funded this important first step in implementing IPM techniques and methods for greenhouse gerbera. The emphasis is on evaluation of pest population dynamics and determining proper scouting techniques.

*Results/Impacts.* Advisor Tjosvold established an experimental site at a commercial nursery in Santa Cruz County in 2004. Pest populations are identified and quantified weekly. This data along with other data compiled at research sites in Ventura and San Diego will be used to evaluate insect population dynamics. We will develop a scouting plan and pest threshold values, where insect control will be necessary. This plan will help growers judiciously use pesticides and/or better time the release of biological control agents.

#### **C. *New Plant Disease Discovery***

*Description.* Tjosvold, in collaboration with Plant Pathology Farm Advisor Steve Koike (based at UCCE Monterey County also serving Santa Cruz County) in plant disease diagnostic processes. Tjosvold is often 'first detector' of field-based problems, with Koike performing laboratory identification through isolations and by using Koch's postulates.

*Results/Impacts.* One recent example of this team work is the discovery of *Peronospora ficariae* on delphinium. Tjosvold performed initial field work and preliminary identification in the lab, with confirmation from Koike. With correct field diagnosis, growers can manage new diseases effectively. Also in 2004, a new downy mildew disease was discovered on marguerite daisy nursery stock and results were published in the peer reviewed journal Disease Notes. Along with publishing new findings in scientific journals, these findings are made available in the statewide newsletter California Ornamental Research Foundation (CORF) News.

**D. *Epidemiology of Phytophthora ramorum Infecting Rhododendrons Under Simulated Nursery Conditions***

*Description.* The current understanding of diseases caused by *P. ramorum* and its biology in nursery crops, has, in the past, been derived almost entirely from casual field observations. Tjosvold and colleagues have implemented various experiments and accumulated data in 2004 (first year) of a two-year study. The goal of the study is to help understand basic epidemiological factors in a simulated nursery setting in the Central Coast.

*Results/Impacts.* This information provides the first basic scientific understanding of real-world nursery epidemiology and has helped nursery operators and agricultural regulators understand and manage the disease. Growers are now aware that if they are in areas with SOD, they should monitor stream water for the presence of inoculum and consider options such as water sanitation or the use of other water sources. Growers now consider infested soil as a serious potential source for transport in the nursery industry. Aerial spread may not be as crucial to the significant spread of the pathogen in a nursery, as first feared. Results have been presented at six nursery meetings locally and in other counties.

**E. *Evaluation of Fungicides for the Control of P. ramorum Infecting Rhododendron, Camellia, Viburnum and Pieris***

*Description.* Nursery operators need a comprehensive program to insure that nursery stock remains free of *P. ramorum*. Fungicides could be part of an IPM management approach to meet that goal. For regulatory and detection purposes, it is important to evaluate whether fungicides are masking symptoms and detection of the pathogen.

*Results/Impacts.* Advisor Tjosvold, in collaboration with other researchers, identified fungicides and application frequency that could provide preventative control of *P. ramorum* infection. Growers can now select effective fungicides that could be useful for preventative control. Also, when significant outbreaks of the disease occurred in early 2004, growers requested and received an unprecedented Special Local Need registration for one material that had proven effective in this project. At the same time, federal and state regulators can feel more confident in the ability of regulatory diagnosticians to detect the pathogen by culture isolations with most fungicide applications.

**F. *Nursery Guide for Diseases of P. ramorum on Ornamentals: Diagnosis and Management***

*Description.* The nursery industry in California, Oregon, and Washington were implicated in the movement of *P. ramorum*. Quarantines were established and agricultural inspectors needed to be trained to identify the diseases as they occur on ornamentals. Preventing the movement and introduction into new nurseries is a goal common to nursery operators and regulatory officials and can have significant impacts to local economies.

*Results/Impacts.* A 20-page diagnostic and management guide was developed during 2004. In addition to full color images of various aspects of *P. ramorum* collected from



around the world, the publication includes 1) a brief history of SOD and *P. ramorum* in nurseries in Europe and North America, 2) pathogen biology, 3) quarantine restrictions and 4) management. Draft documents were made available at all 2004 nursery industry trainings. Clientele and other plant pathologists contributed feedback to strengthen and improve the guide. The document is available through the U.C. ANR publication website: <http://anrcatalog.ucdavis.edu/InOrder/Shop/ItemDetails.asp?ItemNo=8156>

## **II. PROTECT, CONSERVE, AND ENCOURAGE THE WISE USE OF NATURAL RESOURCES**

### **A. Incidence of *P. ramorum* Inoculum Found in Santa Cruz County Streams**

*Description.* In Santa Cruz County, several streams run through woodland affected by *P. ramorum*. It is important to know if and when *P. ramorum* is found in these streams. The pathogen could potentially be dispersed from affected drainages downstream for long distances. In some cases, stream water is used for irrigation by some nurseries and landowners situated along these streams. Water contaminated with inoculum might be inadvertently dispersed to nursery hosts or other landscape hosts.

*Results/Impacts.* Stream monitoring was shown to be a simple but profoundly useful monitoring technique. Serious consideration must now be given to how stream water will be managed if it is used for irrigation purposes. The stream baiting techniques, first demonstrated by Tjosvold, have been used by scientists in an extensive detection and monitoring program funded by the US Forest Service and implemented in California and Oregon by Professor Dave Rizzo, UCCE Specialist at UC Davis, and Professor Everett Hansen, Oregon State University, respectively.

### **B. Sudden Oak Death Educational (SOD) Coordinator**

*Description.* In 2002 funding was obtained through the efforts of the California Oak Mortality Task Force (COMTF) and others to hire and support a southern regional SOD educational coordinator headquartered in Santa Cruz County.

*Results/Impacts.* This coordinator position brought significant resources and provided concentrated educational efforts for the area during its two year tenure. COMTF annual meetings were organized and facilitated by the coordinator. In addition, 10 training sessions were convened with over 1,000 forest professionals, arborists, and other interested persons, and educated about various aspects of SOD. The coordinator made more than 100 educational presentations and displays serving over 4,500 people and 50 groups. Efforts and funding were concluded in July 2004.

### **C. IPM Program for Santa Cruz County**

*Description.* Work related to the IPM Program for Santa Cruz County facilities and property, which was originally implemented in 2001, is ongoing. Advisor Tjosvold is the point person for UCCE Santa Cruz County. Tjosvold's activities include participation in meetings, coordination and monitoring of pesticide use, and evaluating requests for exemptions to the policy, as well as subcommittee work in vegetative management.

*Results/Impacts.* In 2004 Tjosvold and colleagues established a roadside experimental site consisting of replicated plots intended to have multiple mowing cycles. Images of

the French broom development stage are being made at each mowing at roughly the stage where the plant is starting to store food reserves in its roots. Once the project is completed, we will use these images to help County personnel decide when to mow in the future.

**D. UCCE Monterey Bay Master Gardeners Volunteer Program**

*Description.* The UCCE Monterey Bay Master Gardeners volunteer program provides service to the general public and local homeowners through various activities and community service projects. This includes a weekly telephone hotline, pest sample and identification services, and educating county constituents about pesticide use reduction, IPM, and organic methods of gardening.

*Results/Impacts.* There have been eight graduating classes since the program was initiated in 1995. Classes are conducted on Saturdays to facilitate the attendance of the many professionals who complete the program. There are over 125 active members of the UCCE Monterey Bay Master Gardeners program. In 2004 there were over 600 volunteer hotline hours, and over 5,000 volunteer hours spent on various community projects. Currently there are over 15 active community projects.

***Selected Educational Accomplishments***

Advisor Tjosvold's program has a strong educational component to strengthen the knowledge and practices of growers and others working in the horticultural industries. Tjosvold's work includes:

- Sponsored/convened six grower/industry research/educational meetings (with over 600 attendees total).
- Managed the training of 45 new Master Gardener graduates. Presented research-based information at five classes.
- Wrote six columns for newsletters and five peer-reviewed journal articles.
- Managing editor for CORF News, statewide floriculture and nursery newsletter with a statewide readership of over 2,000.

***AFFIRMATIVE ACTION***

Tjosvold and nursery colleagues (principally Julie Newman, UCCE Ventura County and Karen Robb, UCCE San Diego County) have planned and implemented a successful statewide, educational program to meet the needs of Spanish-speaking growers and farm workers. They start with the premise that these trainings should be basic and importantly—hands on—with specimens, microscopes, and field trips to local nurseries when possible. They limit programs to small class sizes, usually 20 to 25 people. In the last ten years many diverse educational programs have been developed for insects, diseases, materials applications, scouting, and basic horticulture.

In 2004 Tjosvold, along with UCCE Riverside Specialist Stephen Wegulo and UCCE Santa Clara County Director and Farm Advisor Maria De la Fuente, planned a new disease identification program. A management section was added to accommodate clientele requests. The program was held at UCCE Santa Cruz County (22 attendees English and 23 Spanish) and at UCCE Ventura County (12 English and 22 Spanish).

**LAURA TOURTE****FARM MANAGEMENT ADVISOR (30% FTE)  
SANTA CRUZ, MONTEREY &  
SAN BENITO COUNTIES  
YEARS IN COUNTY – 5*****PROGRAM DESCRIPTION***

Farm advisors at the University of California Cooperative Extension (UCCE) conduct applied research, education and outreach programs to support and strengthen the agricultural industry. Farm Advisor Laura Tourte helps identify issues and works with farmers in the area of farm management. Advisor Tourte performs research and provides information to local farmers, with special reference to small, beginning, and limited resource farmers. Her program focuses on extending knowledge and information to enhance business knowledge and skills, and generating research that provides farmers with decision-making tools. More specifically, research, education, and outreach activities include:

- Costs of production for locally produced crops.
- Farm profitability and financial management.
- Alternative production and conservation practices.
- New and alternative markets for small farmers.

***SITUATION STATEMENT***

From an economic standpoint, farmers—especially small scale farmers—face more challenges in farming than ever before. Competition and consolidation in the global marketplace, low and unpredictable product prices, increasingly expensive agricultural inputs, and regulatory pressures are four examples of these challenges. In total, they constrain farmers' ability to remain economically healthy, sustainable businesses. There is a significant need for research programs and educational activities that focus on strengthening farm businesses and identifying opportunities to support and sustain the agricultural community.

***PROGRAM REPORT/FOCUS AREAS******I. SUPPORT AND STRENGTHEN THE AGRICULTURAL INDUSTRY******A. Costs of Production for Central Coast Organic Vegetables***

*Description.* In order to make informed business decisions, farmers rely on various tools and support materials to provide information and assistance. Costs of production for income-producing crops are one such tool. Vegetables are high value crops for Santa Cruz and Monterey Counties, and carry significant risk depending on the year. Generating costs of production provides farmers, lenders, and other in the agricultural industry with information to support and assist with decision-making processes.

*Results/Impacts.* Two studies were completed: *Sample Costs to Produce Organic Broccoli* and *Sample Costs to Program Organic Leaf Lettuce* for Santa Cruz and Monterey Counties. Results will be presented at January 2005 and August 2005 Organic Vegetable Production Short Courses. An additional publication, *Organic Vegetable Production Manual*, is forthcoming.

These studies fill an information gap for Santa Cruz and Monterey Counties. They are used extensively by growers, lenders, governmental agencies, and other researchers for cost information and decision-making.

**B. *Alternatives for Central Coast Vineyard Floor Management***

*Description.* Pesticide and sediment runoff from agricultural fields is a significant water quality concern along the Central Coast. Advisor Tourte, in collaboration with UCCE and USDA colleagues, are evaluating alternative vineyard floor management practices (e.g., pre and post emergent herbicides, Clemens<sup>®</sup> cultivation, cover crops) for their effect on runoff and weed control. Tourte's work is specifically focused on the economic aspects of this project.

*Results/Impacts.* Preliminary data for two field seasons has been analyzed. A third year analysis is in progress and will be completed in 2005. Advisor Tourte has presented economic data at one workshop and one field day reaching over 100 farmers and others in the agricultural industry. The preliminary data and reports further inform local growers, industry, and other researchers on cost differences for alternative floor management practices. The information may also assist with farm water quality planning and management decisions. Project will be completed in 2005, with additional workshops, publications and outreach materials planned.

**C. *Cover Crop Practices in Central Coast Organic Vegetable Crops***

*Description.* Cover crops are an important component of organic cropping systems, however, their effect on Central Coast cool season organic vegetables is not well known. This project was designed to evaluate cover crop variety, seeding rate, and supplemental fertilization on winter weed dynamics, soil nitrogen dynamics, nematodes, and production costs. Advisor Tourte's work focuses on the economic component of this project, with USDA and UCCE colleagues focusing on other aspects. The resulting analysis of equipment, labor and material input costs for different practices will inform the larger project and provide information to area farmers.

*Results/Impacts.* First year data has been collected. Second year data is in the collection stages, with analysis to follow. Results and impacts will be reported in 2005, with research ongoing.

**D. *Agricultural Resource Directory***

*Description.* During 2004 Advisor Tourte, with UCCE Monterey County colleague Sonya Varea-Hammond, worked on restructuring, updating, and expanding a 'telephone book-like' resource directory for area farmers. The first edition, produced by Hammond in 1994, was well-received by farmers. The directory has resource and contact

information on all aspects of agriculture including, but not limited to, sections on production, regulations, labor, marketing and education.

*Results/Impacts.* The *Tri-County Agricultural Resource Directory* was completed in December 2004. The directory is specifically geared towards small and limited resource farmers, and provides timely and thorough ‘at your fingertips’ resource and contact information. It is printed in both English and Spanish to provide information to the diverse Central Coast farm community.

## **II. PROTECT, CONSERVE, AND ENCOURAGE THE WISE USE OF NATURAL RESOURCES**

### **A. Central Coast Farm Water Quality - Estimated Costs and Potential Benefits of Conservation Practices.**

*Description.* Multiple watersheds in six Central Coast Counties drain into the Monterey Bay National Marine Sanctuary. This area has significant agriculture within its boundaries. To help protect and maintain water quality along the Central Coast, UCCE, along with the USDA Natural Resources Conservation Service (NRCS), identified estimated costs and potential benefits of installing, operating and maintaining farm water quality conservation practices as ‘high priority’ research information for the area’s farmers. Other technical agencies, such as the Resource Conservation Districts (RCD’s) also flagged cost information as high priority, as did UCCE and NRCS in designing educational programs.

*Results/Impacts.* Nine studies on estimating costs and potential benefits for Central Coast conservation practices were completed in 2003. During 2004 Advisor Tourte presented research results and worked with over 650 English and Spanish-speaking farmers as a part of the 15-hour UCCE-NRCS sponsored Farm Water Quality Short Course educational programs. Advisor Tourte also presented research results at a variety of other conferences and workshops that focus on specific practices and/or assist educators and technical assistance providers both locally and elsewhere in the state.

These studies are “first of their kind” in California. Response has been positive and significant. They are a key foundational resource for farmers and ranchers, and have been used to inform the State Water Quality Control Board on costs and implications of regulations and water quality waivers; USDA-NRCS for their Environmental Quality Incentive Program (EQIP), and other USDA and RCD conservation programs.

### **AFFIRMATIVE ACTION**

Efforts are made to assure access of knowledge and information to all clientele, including underserved clientele, through various outreach methods including personal contact, newsletters, announcements, and educational activities. The *Central Coast Family Farm Report* and some reference materials are translated and offered in English and Spanish to make certain that small and limited resource Hispanic farmers have access to this information. Spanish translation services for some workshops, as appropriate, are also offered at UCCE. In addition, all articles, announcements and resources are designed and included in the newsletter with all small and limited resource farmers specifically in mind.

The University of California prohibits discrimination against or harassment of any person employed by or seeking employment with the University on the basis of race, color, national origin, religion, sex, physical or mental disability, medical condition (cancer-related or genetic characteristics), ancestry, marital status, age, sexual orientation, citizenship, or status as a covered veteran (special disabled veteran, Vietnam-era veteran or any other veteran who served on active duty during a war or in a campaign or expedition for which a campaign badge has been authorized).

University Policy is intended to be consistent with the provisions of applicable State and Federal Laws.

Inquiries regarding the University's nondiscrimination policies may be directed to the Affirmative Action/Staff Personnel Services Director, University of California, Agriculture and Natural Resources, 1111 Franklin, 6th Floor, Oakland, CA 94607 (510) 987-0096.