

University of California Cooperative Extension Santa Cruz County Year 2005 Report



**University of California Cooperative Extension
Santa Cruz County
Year 2005 Report**

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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. Subcategories within this focus area include integrated pest management and invasive species, farm profitability, sustainability, 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. Subcategories within this focus area include marine protected areas, land-sea linkages, farm water quality; water quality and the Monterey Bay National Marine Sanctuary, socio-economics of fisheries, and Sudden Oak Death.

HUMAN RESOURCES – PROGRAM REPORT/FOCUS AREA:

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

Laura Tourte	County Director & Farm Management Advisor
Mark Bolda	Strawberry & Caneberry Advisor
Caroline Pomeroy	Sea Grant/Marine Fisheries Advisor
Lynn Schmitt-McQuitty	Youth Development Advisor
Richard M. Starr	Sea Grant/Marine Advisor
Steven A. Tjosvold	Environmental Horticulture Advisor

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

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

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

William W. Coates	Tree Crops & Pomology Advisor
Sergio Garcia	Livestock & Range Science Advisor

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

Aziz Baameur	Small Farm Advisor
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University Research & Program Support Staff

David Chambers

Staff Research Associate

Heather Holmstadt

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 - 2005

Education & Outreach

• Workshops, Short Courses, Conferences, Field Days	97
• Consultations (Field, Office, Phone, E-Mail)	1,489
• News Releases & Mass Media	125
• Newsletters	11,636
• Publications Distributed (Estimated)	2,000

Volunteer Programs

Master Gardeners Program

• Master Gardener Volunteers	120
• Master Gardener Trainees	44
• Master Gardener Hotline Hours	377
• Master Gardener Community Service & Project Hours	4,981

4-H Youth Program

• 4-H Clubs in Santa Cruz County	12
• 4-H Club Youth Members	303
• 4-H Adult Volunteers	122
✓ Years of Service for Adult Volunteers (range)	1-33
• Number of Projects with Enrolled Youth	61
• Five Most Popular Projects by Enrollment	
✓ Aerospace and Rocketry	86
✓ Creative Arts, Crafts and Hobbies	73
✓ Foods and Nutrition	54
✓ Camping and Outdoor Activities	46
✓ Horses and Ponies	42
• 4-H Community Service & Project Hours – Youth	5,860
• 4-H Community Service & Project Hours – Adults	1,312

Funding Sources – Fiscal Year 2004-2005

University of California (State) & Federal Funds

•	Direct & Indirect	\$791,218
•	Competitive & Non-Competitive Funds	<u>596,200</u>
	Total University & Federal Funds	\$1,387,418

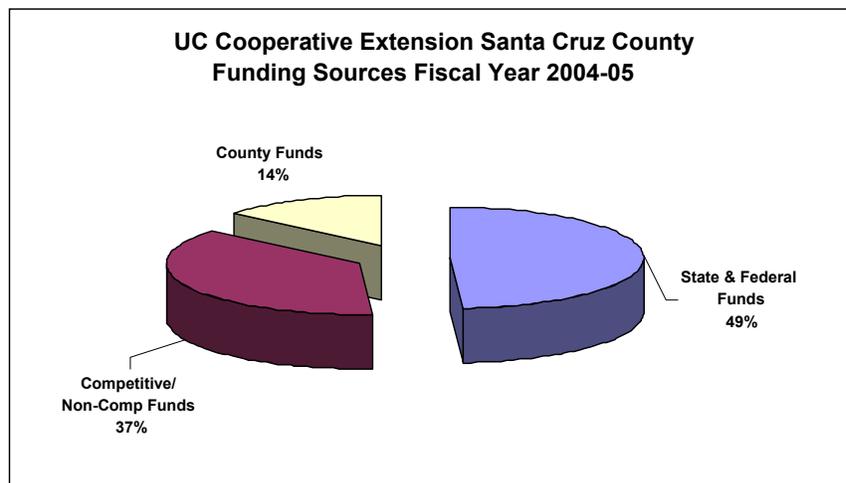
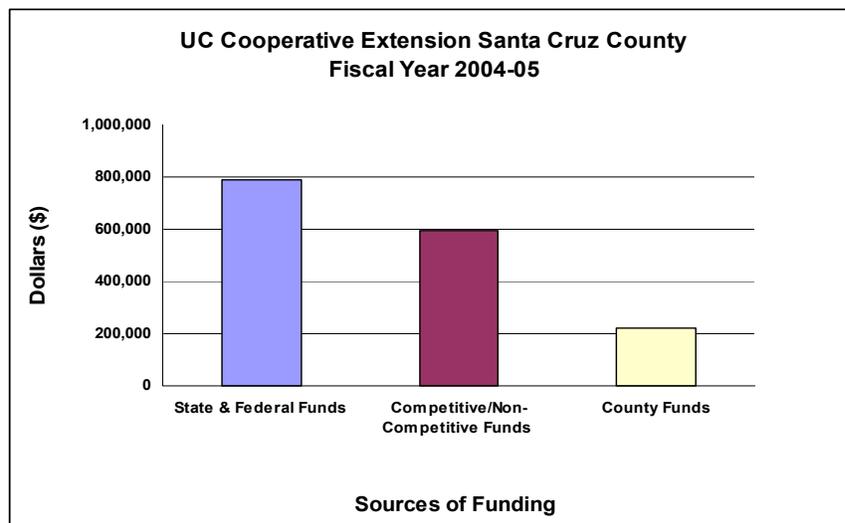
County of Santa Cruz Funds

•	Direct & Indirect	\$223,087
	Total County Funds	\$223,087

Total Funding

•	University, Federal, & County	\$1,610,505
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University & Federal Funds as a Percent of Total	86%
County Funds as a Percent of Total	14%



MARK BOLDA **STRAWBERRY & CANEBERRY ADVISOR (100% FTE)**
SANTA CRUZ, MONTEREY &
SAN BENITO COUNTIES
YEARS IN COUNTY – 4

PROGRAM DESCRIPTION

The position of University of California Cooperative Extension (UCCE) Strawberry and Caneberry Farm Advisor was established to support berry growers—strawberries, raspberries, and blackberries—in the tri-county region composed of Santa Cruz, Monterey, and San Benito Counties.

The strawberry and caneberry research and extension program has a multifaceted strategy for operating in Santa Cruz, Monterey, and San Benito Counties. In cooperation with scientists and others in the agricultural industry, the program conducts research in areas such as plant fertility, irrigation, and pest management with the goal of enhancing fruit yield and quality of strawberries and caneberries. In addition, the program strives to identify new markets and venues for berries, such as organic and off-season production, as well as alternative crops such as blueberries. All research and extension work is performed being mindful of minority groups and groups which may have been underserved in the past.

SITUATION STATEMENT

This position is critical due to the continuing expansion of the strawberry and caneberry industries in Santa Cruz County and the area surrounding Monterey Bay. In the 2004 Agricultural Commissioner's Crop Reports from each of the three counties of Santa Cruz, Monterey and San Benito, strawberries had an approximate total value of \$506 million and were ranked as the highest value crop in Santa Cruz County. The value of strawberries increased more than 50% from the \$334 million value recorded in 2002. In the same three counties, raspberries had a total value of \$127 million, double the 2002 value of \$63 million. Miscellaneous berries, largely composed of blackberries and trailing blackberries such as Ollalieberries, had a total value of \$11.1 million in 2004, a substantial increase from the 2002 total value of \$7.8 million.

PROGRAM REPORT/FOCUS AREAS

I. SUPPORT AND STRENGTHEN THE AGRICULTURAL INDUSTRY

A. Blueberries as an alternative to strawberries and caneberries

Description. Blueberries have potential for economic success as an alternative crop to strawberries and caneberries in the Monterey Bay growing region. The area's temperate climate may offer berry growers the opportunity to introduce new temperate-compatible varieties and produce blueberries when there is little competition from other major producing areas such as Oregon and Michigan.

Results/Impacts. Two trials, one organic and one conventional, consisting of 15 blueberry varieties have been planted in Santa Cruz County. Since this region is different from others

where blueberries are grown, aspects of blueberry management such as soil preparation, pruning and plant fertility are being investigated with the goal of optimizing the best practices. Trials have identified several varieties with characteristics favorable to the Monterey Bay region, such as good flavor, production during profitable times of year and plant productivity. Several meetings, including formal and farm visits with interested growers, were held in 2005.

B. Improvement of yield in raspberry with optimized cane pruning and fertility management

Description. Pruning new vegetative cane in raspberries prior to a first spring crop is standard practice for growers seeking to maximize fruit yield during that time. However, this type of pruning results in a reduction in fruit yield in the second fall crop of the same production year. In this trial it is hypothesized that growers, through a modification in fertility practices, can delay pruning of new vegetative canes, thereby maintaining a near maximum fruit yield in the spring, without a loss in productivity of the second crop later in fall.

Results/Impacts. Preliminary field results show that while there is some gain in the first spring raspberry crop, delaying pruning of new vegetative cane may result in significant fruit loss in the fall due to smaller, less productive canes during that time of year. Further investigations, one of which is funded by a grant from the UC Division of Agriculture and Natural Resources, seeks to modify this method to find the ideal balance between vegetative cane removal in the spring and fruit productivity in the fall.

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

A. Optimum fertility management for raspberries

Description. Many caneberry growers in the Monterey Bay area apply fertilizers without local fertility guidelines. The result can be problems with consistency of fruit quality, and possible over or under-fertilization with consequent effects on the crop and the surrounding environment.

Results/Impacts. In 2004 and 2005, different rates of applied nitrogen fertilizer were tested in field trials, with their effects on soil, plant tissue, and fruit yield evaluated. Preliminary findings indicate that while caneberry plants often respond to different fertilizer rates with respect to vegetative growth, there is not often a significant effect on fruit yield or quality. The project's goal is to determine the most effective fertilizer regime to advance grower practices, assist with profitability, and minimize negative environmental effects.

B. Management of whitefly, lygus bugs, and two spotted spider mites in strawberries

Description. Whitefly, lygus bugs, and two spotted spider mites are crop damaging pests in strawberry. In 2005 collaborative work with a private research organization was undertaken to test a variety of novel pesticides for management of these pests. Most pesticides tested represent reduced risk for the surrounding environment.

Results/Impacts. Several materials were found to be very good at managing the three pests, and information about these new materials, as well as their proper use is being distributed to growers through newsletters and extension meetings. Growers benefit from this information

by understanding proper use of the new pesticides and being able to manage pests more effectively.

C. Redberry mite in blackberries

Description. The redberry mite is a microscopic mite that causes blackberry fruit to ripen unevenly and improperly. It can result in significant yield, thus economic losses to area blackberry growers.

Results/Impacts. In 2005, I, in cooperation with a private industry colleague, identified the most effective control method as being a series of applications of agricultural oil during different blackberry growth stages. This information has been extended to area blackberry growers through extension meetings, newsletters and internet postings. Many blackberry growers are successfully adopting this method to manage redberry mite in both organic and conventionally farmed blackberries. Work continues as we refine application methods and timings of agricultural oils for further control of the redberry mite.

Summary of Educational Accomplishments

The strawberry and caneberry program has a strong educational component focused on strengthening the knowledge of growers and others working in the small fruit industries. Below is a summary of meetings I sponsored this past year.

- *2005 Caneberry Meeting:* Watsonville, CA. January 25, 2005. Attendance: 48 growers and industry professionals.
- *2005 Annual Central Coast Strawberry Meeting.* Watsonville, CA. February 4, 2005. Attendance: 149 growers, industry professionals and researchers.
- *2005 Monterey Bay Academy Field Day.* Watsonville, CA. June 23, 2005. Attendance: 86 growers, scientists and industry representatives.

I also participate in numerous educational activities for growers and other members of the community who have an interest in learning about many topics, such as fertility practices, alternatives in soil fumigation, pest management, and water quality in strawberry and caneberry production. Additionally, I present research results and information at seminars on alternative crops such as blueberries.

Educational presentations are conducted in both English and Spanish in order to further the reach of our extension and educational efforts in Santa Cruz County. Below are selected educational presentations I made in the community during the past year.

- *Arthropod and Disease Control in Caneberries.* 2005 Annual Caneberry Meeting, January 25, 2005. Watsonville, CA. Translated into Spanish. Coordinated by Mark Bolda, UCCE Farm Advisor. Attendees: 48 growers and industry professionals.

- *Manejo de Nutrientes en los Cultivos*. Farm Water Quality Management Project, January 26, 2005. Watsonville, CA. Coordinated by: Farm Water Quality Management Project. Attendees: 58 Spanish speaking growers.
- *Lygus Control in Strawberries*. 2005 Annual Central Coast Strawberry Meeting, February 4, 2005. Watsonville, CA. Coordinated by: Mark Bolda, UCCE Farm Advisor. Translated into Spanish. Attendees: 149 growers, industry professionals and researchers.
- *Soil Fertility and Drip Applied Fumigants*. University of California Pomology Field Day. Watsonville, CA. May 3, 2005. Coordinated by Doug Shaw, UC Davis Plant Sciences Dept. Attendees: 79 growers, industry professionals and researchers.
- *Agricultural History and Current Production Statistics of Santa Cruz County*. Watsonville, CA. May 13, 2005. Coordinated by Leadership Santa Cruz County. Agriculture and Agri-business Day. Attendees: 55 community leaders.
- *Blueberry Varieties and Chill Requirements*. Blueberry Field Day. June 18, 2005. Coordinated by Aziz Baameur and Mark Bolda, UCCE Farm Advisors, and Jim Leap, UCSC Center for Agroecology and Sustainable Food Systems. Attendees: 17 growers, shipper representatives and home gardeners.

AFFIRMATIVE ACTION

The group to which I direct my affirmative action efforts is composed of minority growers and Pest Control Advisors in strawberries and caneberries. I reached out to Spanish speaking growers by making regular farm visits, giving presentations in Spanish, having talks translated at meetings which I organized, publishing newsletters in Spanish, and also assisting colleagues with the translation of research and extension work into Spanish.

My efforts in Affirmative Action are not limited to only Hispanics. I have the occasion to use my knowledge of Japanese to further the extension of information to Japanese speakers, and I am pursuing a greater knowledge of the language and culture of indigenous people from the Oaxaca state in Mexico who work in California.

CAROLINE POMEROY**MARINE FISHERIES ADVISOR (100% FTE)
SANTA CRUZ COUNTY, MONTEREY BAY AREA &
STATEWIDE RESPONSIBILITIES
YEARS IN COUNTY – 1*****PROGRAM DESCRIPTION***

Marine Advisors at the University of California Cooperative Extension (UCCE) help identify and solve coastal and marine resource problems by developing, applying and transferring research-based information for a variety of commercial and non-commercial groups, marine resource management agencies and other marine resource interests, as well as the general public. The Marine Fisheries Advisor provides a UCCE/Sea Grant Extension social science program based in Santa Cruz County with Monterey Bay region and statewide responsibilities to enhance understanding of the socioeconomic interactions in fisheries and the consequences of management for coastal communities; to assist the wise development, conservation and management of marine and coastal resources; and to enable more proactive and effective community responses to related change.

Carrie Pomeroy began a 5-year term appointment as a Marine Fisheries Advisor in July 2005. Previously, she was an Associate Research Scientist with the Institute of Marine Sciences at UC Santa Cruz, where she developed an applied social science research program on California's fisheries and fishing communities. As a Marine Fisheries Advisor, she identifies fisheries constituents and their concerns, provides research-based information to address community and management needs, and facilitates communication and cooperation among marine resource, and especially fisheries, audiences in the Monterey Bay area and statewide. She also conducts applied social science research and extends research-based knowledge through appropriate Cooperative Extension educational methods. During her first six months as Marine Fisheries Advisor, Pomeroy focused on the following:

- Building on previous and current research on the socio-economics of California fisheries to enhance its extension value as part of her program.
- Initiating a process to determine fisheries social science information needs.
- Identifying ways to meet those needs through research, education, and outreach.

SITUATION STATEMENT

California's marine fisheries constitute a valuable and diverse component of the state's economy. However, they are also vulnerable to environmental, socio-economic and regulatory variability and change, which together pose significant challenges to fishery participants and fishing communities. Major changes in both federal and state legislation governing fisheries management in the latter 1990s have added important new challenges for fishery participants and their communities, and for fishery managers. In response, they are working to maintain and develop fisheries and communities that are environmentally and economically sustainable, and resilient to variability and change from all sources. At the same time, there is

growing recognition of the critical need to more fully consider the human dimensions of fisheries—the social, cultural and economic features of fishery participants, their practices and their communities, and how these affect and are affected by management—to design management that is more effective in ecological and human terms.

PROGRAM REPORT/FOCUS AREAS

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

A. Conducting research on the human dimensions of fisheries and fishing communities

Description. Both the 1998 California Marine Life Management Act and the 1996 Federal Sustainable Fisheries Act require the meaningful use of social scientific data in the development and implementation of fishery management plans. Even as efforts to fulfill these mandates – and meet practical resource management needs – have increased, the critical shortage of sound social scientific data on fisheries has become an obstacle to effective resource management.

One of Pomeroy’s objectives is to help build and disseminate social scientific information on the state’s fisheries through collaborative research, education and outreach efforts that involve fellow scientists, state and federal agency personnel, fishery participants and other fishery interests. Pomeroy also synthesizes research publications and makes presentations to provide people with a clear understanding of fisheries socio-economics and policy issues.

Results/Impacts. In 2005, Pomeroy, with colleague M. Dalton, completed a study of the social and economic aspects of seafood production for the three major Monterey Bay ports. The resulting report is available to the public, and is to be used by state and federal resource managers to inform their management efforts in the region, and enable them to evaluate the socio-economic impacts of potential management measures. Pomeroy and Dalton continued work on a related study of the fishing community of Moss Landing. The result of that study will be used 1) to evaluate the impacts of fishery management on the Moss Landing community, and 2) to help develop research strategies to better assess the impacts of fishery management on West Coast fishing communities.

B. Facilitating the exchange of social scientific information among diverse fisheries interests and the general public

Description. Recent changes in fishery management policy have broadened the range of stakeholders and participants in marine resource management. At the same time, mandates for ecosystem-based management have expanded the scope and complexity of management. These two changes have highlighted the need for accurate, up-to-date, and unbiased information on the human as well as the ecological dimensions of fisheries. The sustainability of fisheries in both ecological and human terms hinges on the effective development and dissemination of this information. And because different fisheries interests have different and complimentary types of knowledge to contribute, it is essential that their respective contributions be elicited, evaluated and integrated.

Results/Impacts. Pomeroy is collaborating with NOAA Fisheries economist Cindy Thomson on a project to characterize West Coast and fishing communities using existing data, augmented by review and input from fishery participants, scientist and managers. The results

will include information not presently available on the human dimensions of West Coast fisheries that will be used by California (and West Coast) fishing communities, state and federal fishery managers, and the general public, as well as the Fisheries Education Project described below. Pomeroy is also working to develop educational materials based on this and her other work for diverse audiences in collaboration with UCCE/Sea Grant colleagues and fishery participants.

C. Providing advice for sustainable resource management

Description. California's resource managers face new challenges as they try to meet growing legal and practical demands for social scientific information in resource management. Most are trained in the biophysical sciences, and while many have considerable knowledge of the human dimensions of fisheries, they lack formal training in social scientific research and its application to fishery management. Moreover, the larger institutional structures they work within often lack the capacity for meeting these newly recognized needs.

Results/Impacts. Though her research and outreach, Pomeroy provides advice on the human dimensions of sustainable resource management to state and federal resource managers and stakeholders. In 2005, she provided advice on the socio-economic impacts of fishery management (e.g., restricted access or limited entry) and marine protected areas (MPAs) on fishery participants and fishing communities. In addition, she provided social scientific advice to the Fishing Heritage Group, a coalition of Central Coast fisheries, harbor and environmental representatives working to build shared understanding, and to achieve common goals of environmentally and economically sustainable fisheries and fishing communities.

Summary of Primary Accomplishments

- Initiated a needs assessment to help shape human dimensions of fisheries research, education and outreach program.
- Presented research results from two studies at the annual meeting of the American Fisheries Society
- Presented research results to the California Biodiversity Council at its Ocean and Coastal Economics Symposium.
- Participated in a workshop for Pacific Coast Sea Grant Extension fisheries personnel to develop and integrate human dimensions research, education and outreach to inform coast-wide fishery management issues.
- Completed a Sea Grant-funded study of the economics of seafood production from the three Monterey Bay area ports, with M. Dalton, CSUMB.
- Conducted collaborative research with academic, agency and fisheries colleagues on the human dimensions of Monterey Bay and West Coast fisheries, and the use of social science in state fishery management plans.
- Advised colleagues in the design of a survey to assess the fisheries and fishery infrastructure needs of Santa Barbara Channel ports.
- Served as an advisor to the Central Coast Fishing Heritage Group.
- Completed an evaluation, with Oregon Sea Grant's F. Conway, of human dimensions of the Juvenile Rockfish, Cabezon, and Greenling Collaborative Fisheries Research Project.
- Participated in the Channel Islands MPA Socio-Economic Monitoring Workshop, and the National MPA Center's West Coast Regional Social Science Workshop.

- Advised on the design of, and participated in, the National MPA Science Center's Mapping Human Activity in the Marine Environment: GIS Tools and Participatory Methods Workshop.
- Provided input on efforts to develop a nationwide human dimensions research, education and outreach strategy to address the impacts of harmful algal blooms.
- Received funding from California Sea Grant for a study of Santa Cruz Wharf anglers' exposure to domoic acid toxins, with UCSC biological oceanographer M. Silver and UCSC statistician Raquel Prado, and from the California Communities Program, with C. Culver and P. Nelson, for an intern to assist with the development of a fisheries education program.

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

A. Improving the social science and environmental literacy of our youth

Description. Low and declining levels of science and environmental literacy have been well documented in the US. A critical yet often overlooked aspect of this literacy relates to the human dimensions of fisheries. This understanding is essential to the sustainability of fisheries in ecological and human terms, and the coastal communities that depend on fisheries for food, recreation and other social and economic benefits. At the same time, the general public has gained new opportunities and responsibilities to participate in effective resource management. To help better inform California youth and empower them to make wise choices as consumers and stakeholders, Pomeroy serves on the Advisory Board for the Friends of Moss Landing Marine Laboratories (FoMLML) Fisheries Education Project.

Result/Impacts. Pomeroy participated in the group's advisory board meetings to plan a series of workshops with Monterey Bay area educators, scientists and fishery participants to develop a fisheries curriculum to be piloted locally in the Fall 2006.

Summary of Primary Accomplishments

- Served on the Advisory Board of the FoMLML Fisheries Education Project.

AFFIRMATIVE ACTION

The ethnic, social and economic diversity of marine resource users in California is not well documented. Still, it appears that most of the clientele are Caucasian males. Pomeroy's affirmative action efforts include research to document the social, cultural and economic diversity of the state's fisheries, and education and outreach targeting the diverse fisheries clientele. In conducting her needs assessment, she has contacted fishery clientele from diverse groups. Her involvement in the FoMLML's Fisheries Education Project is also an example of her affirmative action efforts, where she is collaborating with education, science and fishing partners to build and extend knowledge about the region's fisheries to the area's diverse youth. In addition, her recently funded Sea Grant project seeks to identify and characterize socially, culturally and economically defined subpopulations that may be at risk of exposure to domoic acid in fish.

**LYNN SCHMITT-
MCQUITTY**

**YOUTH DEVELOPMENT ADVISOR (100% FTE)
SANTA CRUZ & MONTEREY COUNTIES
YEARS IN COUNTY - 5**

PROGRAM DESCRIPTION

Youth Development Advisors at the University of California Cooperative Extension (UCCE) work to develop leadership, citizenship, and life skills for youth. Youth Development 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 2005, 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

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

A. Youth community science education program

Description. The Youth Community Science Education program provides youth organizations with research based curricula, resources and workshops in the areas of: Science, Technology, Natural Resource Education, Environmental Stewardship, Garden Based Learning, Staff Training. The workshops are highly interactive and seek to link research with practice. The *Youth Community Science Education* programs offer: Workshops delivered within your community, Research based information, Interactive activities and practical tips, Resources, On-going technical assistance. Curricula in the *Youth Community Science Education* program use the experiential learning model, where young people have an opportunity to participate in fun, engaging activities that promote learning and understanding through hands-on/minds-on activities.

Results/Impacts. During 2005 I provided resources and training to 11 afterschool sites implementing science, technology, environmental stewardship and natural resource education at their sites. This has resulted in over 180 hours of education to over 590 youth in Santa Cruz and Monterey Counties.

B. Experiential learning design and delivery project

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. 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.

Results/Impacts. In 2005 the focus of this project was in fine tuning the training instruments and delivering them to a wide variety of audiences. A total of 9 training opportunities were provided at state, regional and national events including the Western Regional 4-H leaders Forum, The Association for Outdoor and Environmental Education, The California 4-H State Leadership Conference and the National Association of Extension 4-H Agents Conference. As a result of this fine tuning, we have submitted a journal article for publication of our research findings regarding the value and impacts of this project. Lastly, we have been working to develop and complete the Experiential Learning website which can be accessed at: <http://www.experientiallearning.ucdavis.edu/default.shtml>

C. National partnership for after school science

Description. Sharon Junge, Youth Development Advisor and County Director in Placer and Nevada Counties, as part of a national afterschool collaborative, secured \$66,000 in funding for three years to deliver science technology and engineering afterschool curricula in Santa Cruz County. I will be working with community collaborators to deliver and evaluate the program. September, 2005 – August, 2008.

Results/Impacts. To date I have selected my community partner and have laid out the monthly training schedule through June, 2006. In addition, the grant also provides money to hire program support for 8 to 10 hours a week.

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

A. Together for youth: advisory committee member

Description. The current focus of this collaborative has been on reducing binge drinking in Santa Cruz County 12 to 19 year olds by 5% in 5-years.

Results/Impacts. As part of this project, community forums were held throughout Santa Cruz County in order to assess teen and adult attitudes related to binge drinking. The UCCE Office hosted the Watsonville forum where over 30 teens and adults provided their candid thoughts on the situation.

B. Watsonville afterschool collaborative: coordinating member

Description. Since June of 2005 a group of afterschool providers has been meeting monthly in an attempt to share programming resources, schedules and research related to youth development in the Pajaro Valley. Attendance has been spotty and unreliable. As a member of the coordinating team, we will be evaluating the benefit and purpose of this collaborative before moving forward.

Results/Impacts. Watsonville Future First Conference. I was invited by the Watsonville Parks and Community Services Department to provide the closing remarks at their community wide forum on Asset Development. This invitation came as a result of my involvement in the Applied Developmental Science Workgroup and the awareness of community members of the proposed photographic research we hope to conduct beginning in 2006. The conference was attended by youth, as well as local decision and policy makers from City and County government, as well as the school district.

C. Life skills research

Description. In 2005 members of the Afterschool workgroup began looking at the question of *How are life skills developed in after school programs to improve academic outcomes in youth?* As the co-principal investigator of this project, we are conducting this research in Los Angeles County and locally with two organizations that serve youth in the after school hours.

Results/Impacts. A literature review was conducted to better inform our research and assist us in developing our interview instruments. The instruments have been used with one site in Watsonville, with the second site visit scheduled for early January. The results of the site visits will assist the team in refining our instruments in order to replicate this research in 10 additional counties in 2006. Final outcomes of this project will include the development of best practices tips sheets and professional journal articles to advance the field of youth development and improve afterschool practices.

D. Applied developmental science workgroup community photographic assessment project

Description. As a member of this workgroup, I am working on research to evaluate the impacts that positive youth development models, such as asset building, have on communities and youth in California. The initial workgroup research documented the impacts of positive youth development in San Luis Obispo and Santa Clara counties, and how youth collaboratives can strengthen the notion of young people being seen as assets and not liabilities in their communities. The next phase of this project will use the research findings from San Luis Obispo and Santa Clara counties, to inform positive youth development practices in Pasadena and Sacramento.

Results/Impacts. As part of the research team, I conducted interviews of Pasadena youth development professionals in order to assess the supports and opportunities available for youth in Pasadena. In addition, I also provided training for teens on how to conduct the community photographic assessment project, which provides youth with an opportunity to document how they view their community and to capture how they feel the community views them. Due to my involvement in this project, we are making plans to partner with Friday Night Live to replicate this study in Santa Cruz County in 2006.

E. Provide direct supervision, training, support and evaluation of 4-H community club program and program representative staff

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. For this period of review I have worked to support the efforts of 4-H Community Club Program and Program Representative Staff in the following ways:

Results/Impacts.

- *4-H Community Club Newsletters. January – December, 2005.* In 2005 the educational focus of my newsletter articles were on explaining the understanding and incorporated the 40 Developmental Assets into the 4-H Program.
- *New Santa Cruz County 4-H Program Representative Training. September – December, 2005.* In September, Santa Cruz hired a new 4-H Program Representative. While this individual had previous Program Representative experience in another county, I spent a considerable amount of time training and orienting this person to the Santa Cruz County program. At this point, the transition has gone very well, with positive movement and progression in the program during 2005.

AFFIRMATIVE ACTION

Affirmative action is included in my program outreach objectives as well as a component in planning, implementing and evaluating. Current statistical data pertaining to populations served and to be served by programs is maintained and considered for program development and implementation. As a result, I thread affirmative action throughout all of my program initiatives.

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.

For this period of review, I have successfully connected to and trained 11 afterschool sites to implement educational programs in the areas science, technology, environmental stewardship and natural resource education. This program has allowed local educators to provide science-based education to over 590 students in communities where 64% of the youth participants are of non-Caucasian ethnicities. As a result, traditionally underserved communities are now connected to the University of California 4-H Youth Development Program and have participated in 180 hours of science-based instruction led by local educators.

In addition, community 4-H clubs in Santa Cruz County regularly promote and recruit for members and volunteers at community festivals and events, as well as through newspaper articles, community service and leadership activities in the local communities.

RICHARD M. STARR**MARINE ADVISOR (100% FTE)
SANTA CRUZ & MONTEREY COUNTIES
YEARS IN COUNTY – 14*****PROGRAM DESCRIPTION***

Marine Advisors in UC Cooperative Extension 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 2005 Marine Advisor Rick Starr worked in four primary areas. They were:

- *Youth Education.* Rick Starr is on the Board of Directors of Camp SEA Lab, an ocean science camp for children.
- *Public Education and Extension of Research.* Starr extends research information to public and private groups through publications and presentations.
- *Development of Improved Resource Management Practices.* Starr provides technical advice, training, and leadership to help governmental agencies, environmental organizations, and resource users develop and coordinate coastal resource management plans.
- *Marine Fisheries Research.* Starr conducts research on rockfish and lingcod to provide information for improving the wise use, conservation, and management of valuable fishery resources.

SITUATION STATEMENT

The focus of marine and coastal activities in Monterey and Santa Cruz 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. The current issues in fisheries revolve around the need to conserve fished populations and improve fishery management while maintaining viable commercial and recreational industries.

With the large diversity and number of marine users in this region, resource use conflicts are bound to exist. Many of the resource use conflicts in this region stem from differences among conservation, recreation, fisheries, and urban development interests, and are often multi-faceted. As a UCCE Marine Advisor, Rick Starr helps resolve local and regional resource use conflicts by providing research-based information, providing leadership to bring groups together to solve problems, and inserting logic and rationality into the discussions. Starr also has an active research program to better understand the ecological relationships of coastal fishes.

PROGRAM REPORT/FOCUS 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 dollars. 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.

Results/Impacts. Starr synthesizes research publications and makes presentations to provide people with a clear understanding of natural resource and public policy issues. He 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 should 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.

Results/Impacts. 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. In 2005, his research team

worked with recreational and commercial fishermen to survey nearshore rocky habitats. 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 5 short articles about natural resources for public distribution
- Published 1 scientific article about fish movements and marine reserves
- Made 11 presentations about natural resource policy issues
- Presented 2 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
- Conducted collaborative field research with west coast researchers

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 in the United States, 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 teachers have experienced increasing difficulty maintaining proficiency in science literacy. U.S. school children rank poorly in science and math scores compared to other developed countries, and many people are concerned that we will lose our competitive edge in the global economy unless we train youth to apply scientific methods and new technologies towards the use and management of our finite natural resources.

Results/Impacts. Rick Starr has been working with community leaders to guide Camp SEA Lab, an ocean science camp for children. The residential nature of Camp SEA Lab provides children with the experience of living, working, and learning together. The curriculum emphasizes the development of leadership, stewardship, and team-building skills as a compliment to the educational focus on marine sciences. Children learn through a variety of hands-on outdoor activities, interactive classroom projects, field seminars, and visits to regional educational exhibits. An important aspect of Camp SEA Lab is that we recruit ethnically and economically diverse students, including underprivileged and at-risk children, as well as those considered as gifted.

Summary of Camp SEA Lab Primary Accomplishments

- Provided teacher workshops to train educators in outdoor education techniques
- Provided outdoor science camps for school groups, lasting 3 days each
- Provided 5 residential summer camps, each one-week long
- Provided 4 summer day camps, each one-week long
- Served more than 1,000 people

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 2005 were women. The children that participated in Camp SEA Lab offerings in 2005 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 300 children participating in Camp SEA Lab in 2005 were provided full or partial scholarships.

STEVEN A. TJOSVOLD**ENVIRONMENTAL HORTICULTURE
FARM ADVISOR (100% FTE)
SANTA CRUZ & MONTEREY COUNTIES
YEARS IN COUNTY – 23*****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 Master Gardeners Program, Monterey Bay Master Gardeners.

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 \$403,000,000 in 2005 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. Research and education 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/FOCUS AREAS***I. SUPPORT AND STRENGTHEN THE AGRICULTURAL INDUSTRY******A. Biology and management of *Phytophthora ramorum* (SOD)***

Description. Projects deal primarily with issues and problems related to rhododendron and camellia production in commercial nurseries, and secondarily are related to native tree and shrub species in forests. The environmental horticulture advisor continues to support local research and extension work on SOD in conjunction with a Statewide Task Force and state

and national research community. The *Epidemiology* experiment that began in 2004 continued in 2005, while the *Seasonal* and the *Testing* experiments described below began in 2005.

- *Epidemiology of Phytophthora ramorum in nurseries*

The current understanding of diseases caused by *Phytophthora ramorum* and their dynamics in nursery crops is almost entirely derived from casual field observations. The objectives of the study are to help understand basic biological factors such as inoculum viability, dispersal, and infectivity that influence disease occurrence and severity in a rhododendron nursery: 1) We need to know whether naturally-infested stream water could infect nursery hosts if the water is used for irrigation. 2) We need to know under what conditions soil-borne inoculum can be important in infecting rhododendron stock. 3) We need to understand the dynamics of aerial dispersal from infected plants to adjacent and nearby plants. Experiments are conducted under conditions that simulate a commercial containerized rhododendron nursery operation on the Central Coast of California.

- *Seasonal symptom expression, detection, and potential for infectivity of Phytophthora ramorum on rhododendron and camellia*

The new federal order and state regulations require annual nursery stock inspection and laboratory analysis of host samples for *Phytophthora ramorum* in California, Oregon and Washington. The effectiveness and success of these regulations depend on: (1) agricultural inspectors prudently selecting samples for laboratory analysis with correct symptoms and (2) laboratory diagnosticians' ability to effectively detect the pathogen with current laboratory methods. This study will document both seasonal symptom expression in infected rhododendron and camellia in a nursery-like setting and the effectiveness of laboratory diagnostic methods in detecting this pathogen. Information gathered from this study should help determine the time periods for which detection of *P. ramorum* is optimal and what range of symptoms are expected on nursery-grown camellias and rhododendrons at different times of year. It should also allow us to evaluate the effectiveness of the standard detection methods over a one year period. This information is expected to give agricultural officials some level of confidence in detecting *P. ramorum* when samples submitted for analysis. This study will also answer the question of how long the pathogen remains viable in infected leaves still attached to the plant and whether infected plants would later produce infectious propagules in conducive conditions. The study is being conducted on rhododendron and camellia, which are the two most important hosts of *Phytophthora ramorum* in the nursery trade.

- *Testing Phytophthora ramorum sporulation potential and relative susceptibility of eastern forest shrubs and trees*

The devastating SOD problem in the western United States has caused tremendous plant damage and economic loss to both forest resources and commercial nursery industries. A notable feature of the SOD pathogen, *Phytophthora ramorum*, is its extremely broad host range. The large number of susceptible plant species is interesting from a biological/ecological point of view as well as quite problematic from a management perspective. *P. ramorum* has been shipped on infected ornamental nursery stock from nurseries on the West coast to many locations around the United States. Infected outplantings may eventually be established in areas of the eastern United States where valuable forest and

woodland species exist and environmental conditions are conducive to the development of new disease outbreaks. Information on potential host plants found in eastern parts of the country can assist researchers and regulators in focusing detection efforts on those species. The purpose of this study is to: 1) Provide preliminary information on susceptibility of selected eastern forest and woodland species to the SOD pathogen, and 2) Evaluate the potential of such hosts to function as sources of inoculum.

Results/Impacts. It is important that the results of these experiments be conveyed as soon as conclusions can be drawn. In 2005, results were conveyed to the nursery industry and regulation officials in 8 meetings and presented in popular publications and newsletters. 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 thought.

B. Air circulation tubes for prevention of downy mildew on greenhouse roses

Description. Downy mildew can be among the most destructive of all cut rose diseases when environmental conditions favor its development. The causal agent, *Peronospora sparsa*, is found throughout the world, virtually everywhere roses are cultivated. A novel air movement system to circulate air more effectively through the leaf-canopy was evaluated and demonstrated under greenhouse conditions. The system was evaluated for cost and benefits to rose growth and disease control.

Results/Impacts. In late 2004, we installed two different leaf-canopy air circulation systems at two commercial cut rose greenhouses in Watsonville. In both systems an electric fan and perforated polyethylene tube provided approximately one air exchange per minute per plant production volume. In 2005 data was collected on environmental characteristics within the rose leaf canopy with and without air circulation and downy mildew incidence was monitored. These experiments have shown that the length of leaf wetness might influence disease occurrence, and air circulation might control disease by drying leaves. Future work might determine what the length of that critical wet period is for disease to occur. Reliable and sensitive leaf wetness sensors are needed for this research, and fortunately this sensor technology is improving rapidly. Two new sensors from two reputable companies have come on the market in the last 6 months. If leaf wetness sensors prove to be more reliable and sensitive and disease thresholds can be established, leaf wetness monitoring could be used in a new disease management strategy. Leaf wetness sensors could be linked to controllers that turn air circulation fans on and off so electrical power is used very efficiently. Fans would be turned on only when leaf wetness monitoring indicates that action thresholds have been met, and leaf drying is needed.

C. Liverwort control and Mogeton phytotoxicity evaluation

Description. Container ornamentals grown in the cool, relatively wet, climates such as areas in the Central Coast of California are prone to infestations by weedy primitive plants called liverworts, *Marchantia spp.* Existing pre-emergent herbicides are nominally effective and there are no registered products for post-emergent control.

Results/Impacts.

Efficacy of conventional and alternative pre-emergent herbicides for the control of Liverworts. Experiments were conducted to test the efficacy of herbicides when applied before liverwort germination. Results indicated that some commercial herbicides were somewhat effective. Some alternative products showed some promise, but more research on methods and concentrations will be needed to develop these products further.

Evaluation of phytotoxicity to herbaceous ornamental plants with applications of Mogeton 25WP (quinoclamine). As part of a federal program for new and experimental pesticides (IR4), a local research trial was established in 2005 to determine the safety of a promising post-emergent herbicide, Mogeton, on a wide range of ornamental species. Results were submitted to IR4 December 2005 and will support the registration of the product and expansion of its label. Federal registration is forthcoming. This is important because it will give growers a new tool to manage liverwort infestations, with the overall goal being to improve profitability for growers.

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 long distances from affected drainages downstream. In some cases, stream water is used for irrigation by 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 developed by Advisor 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 UCCE Specialist Dave Rizzo at UC Davis, and Professor Everett Hansen at Oregon State University.

B. 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 and managed by County personnel. Advisor Tjosvold is the point person for UCCE Santa Cruz County. Tjosvold's activities include participation in Department Advisory Group meetings, consultation on pest management issues, and is chair of the Vegetation Management subcommittee. Two

demonstration/research field plots have been established to help the County understand and manage vegetation alongside County roadsides without the use of herbicides.

Results/Impacts. In 2005 Tjosvold and County personnel 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. Also, another vegetation management experiment was begun in late 2005. This experiment will demonstrate the possibility of management of roadside vegetation with one or more cultivations (rototilling) followed by hydro-seeding with perennial grass species. The goal of the project is to see how many cultivations are sufficient to reduce weed competition and how effective native grass establishment is in producing desirable roadside vegetation characteristics.

C. 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 100 active members of the UCCE Monterey Bay Master Gardeners program. In 2005 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. A new Master Gardener training is planned for January through June 2006. Upon completion of the program, over 40 new Master Gardeners are expected to graduate.

Summary of 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 five grower/industry research/educational meetings (with over 400 attendees total).
- Wrote 6 articles for newsletters, 4 popular publications, and five peer-reviewed journal articles.
- Managing editor and contributor for California Ornamental Research Foundation (CORF) News, statewide floriculture and nursery newsletter with a statewide readership of over 2,000.

AFFIRMATIVE ACTION

Tjosvold and other UCCE colleagues 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, material applications, scouting, and basic horticulture.

In 2005 Tjosvold, with UCCE Riverside Specialist Don Merhaut and UCCE Santa Clara County Director and Farm Advisor Maria de la Fuente a program on “ABCs of Horticulture” was presented. The information was based on the successful training in English conducted two years ago; this year it was revised by organizers and presented in Spanish by Maria de la Fuente. The program was held at UCCE Santa Cruz County (35 attendees), UCCE Ventura County (31 attendees), UCCE San Diego (30 attendees).

LAURA TOURTE**FARM MANAGEMENT ADVISOR (30% FTE)
SANTA CRUZ, MONTEREY &
SAN BENITO COUNTIES
YEARS IN COUNTY – 6*****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.
- Record keeping, financial management and farm profitability.
- Alternative production and conservation practices.
- Market trends and opportunities 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 berries***

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. Berries 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. A study entitled *Sample Costs to Produce Raspberries for the Central Coast* was completed in 2005. Results from the studies, along with market trends and opportunities for small raspberry and blueberry farmers were presented at several workshops and field days during 2005, with attendees estimated at 100. Berry studies planned for 2006: organic strawberries and blackberries. Cost studies can be downloaded and/or viewed at <http://coststudies.ucdavis.edu>.

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[®] cultivation, cover crops) for their effect on runoff, weed control, and economics. Tourte's work is specifically focused on the economic aspects of this project.

Results/Impacts. Analysis of four years field data was completed in 2005. Advisor Tourte presented economic results at one workshop reaching roughly 75 farmers and others in the agricultural industry. A research report for the entire project was also completed. An additional written analysis emphasizing the economic aspects of the project is in progress. The analyses and reports inform local growers, industry, and other researchers on cost differences for alternative floor management practices. The information is also expected to assist with farm water quality planning and management decisions.

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. Field data for two years has been collected and is being analyzed. Results and impacts will be reported in 2006, with education and outreach to follow.

D. Small Farm Handbook revision

Description. During 2005 Advisor Tourte, with UCCE colleagues throughout the state, began work to revise the popular University of California Small Farm Handbook. The first edition, produced by the Small Farm Center in 1994, was well-received by farmers. The handbook will update important information on all aspects of agriculture including, but not limited to,

the basics of farming, enterprise selection, financial management, marketing, growing crops, postharvest handling and food safety, and small farm vitality.

Results/Impacts. A newly revised Small Farm Handbook is expected to be published in 2006. The handbook is specifically geared towards small-to-mid-sized, beginning, and limited resource farmers. It will provide up-to-date information for a broad cross-section of the state's farmers, including those located along the Central Coast of California.

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. Nine studies were completed in 2003.

Results/Impacts. During 2005 Advisor Tourte presented information on potential costs and benefits to roughly 350 Central Coast farmers (vegetable, berry, vineyard, orchard) as part of the 15-hour UCCE-NRCS sponsored Farm Water Quality Short Course educational programs. Tourte also presented research results at several professional society meetings and other workshops (estimated attendees: 110) to inform and/or assist farmers, educators, and technical assistance providers both locally and elsewhere in the state.

The 2003 studies are expected to be revised during 2006 to provide updated information to the area's agricultural community. The studies remain 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. Spanish translation services for some workshops, as appropriate, are offered at UCCE. Advisor Tourte continued to work on a self-paced Spanish language computer course in 2005. Articles, announcements and resources are designed to include information with small and limited resource farmers specifically in mind.

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