# *Summer 1996*

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Summer, 1996 (v8n3)

***From the Director:***

# Internet: Advantages for Agriculture

Long before most people had heard of networking computers together and fewer still had heard of the Internet, a computer company began using the marketing slogan "the network is the computer." The slogan is correct. The power of a computer lies not within its ability to balance a checkbook or play a computer game, rather it lies within the speed and the ease with which it provides access to useful information. Computer networks allow information to flow more freely, with fewer obstructions. Networking flattens hierarchies by allowing those looking for information to go directly to many sources of information, bypassing traditional filtering mechanisms or "gatekeepers" like educational institutions and the media. It allows all kinds of people to contribute to the information flowfarmers and other practi-tioners, researchers, consumers and policymakers. Information can come directly from the sourcefrom a farmer who has used crimson clover as a cover crop in his or her field, to the researcher who has published a 7,000 word paper on nitrogen-fixing bacteria.

The global network of computers linked together called the Internet is revolutionizing the way we receive information. The Internet is an example of the power that can exist when computers are linked together. The exponential growth of the Internet has far exceeded even the early estimates of sloganeering computer companies. The network is the computer, but more importantly the network is access to information. By some estimates, the number of computers linked in the Internet exceeds ten million and spans dozens of countries. That number has doubled in size in the last two years. The size of the information base is unfathomable.

The Internet is still in its infancy, yet it contains more current information than any other information source. For those who are linked to it already, it can be easy to use, and the information accessible within it is available 24 hours a day, seven days a week. The tools for finding what you want in the growing body of information are still imperfect, and it takes time and money to learn how to use it.

When most people talk about the Internet they are referring to the World Wide Web. The Web is the most popular medium on the Internet (others include electronic mail and the Gopher information system). Because it offers so much information and is relatively easy to use, it has been the driving force behind the Internet's growth. The Web allows users to quickly visit sites around the world simply by clicking on links embedded in the text. Pictures, movies, sounds, and libraries of text can be accessed online.

SAREP joined this vast information system more than a year ago. Our site(http://www.sarep.ucdavis.edu), which recently won a bronze award from the national Council for Advancement and Support for Education (CASE),

has been visited by individuals residing in more than 50 countries around the globe and thousands of people within California. The Web has allowed us to distribute sustainable agriculture information faster and more effectively than by any traditional media outlet. A good example is this newsletter. Before it reaches your mailbox , it is available online, along with most of our back issues of Sustainable Agriculture. We are able to distribute all of our free publications, Requests for Proposals, SAREP-funded project summaries, and calendar items related to sustainable agriculture faster and easier than by mailing paper copies of this information to individuals. We also have the potential to reach more people. Additionally, by linking our databases to the Web we are able to allow access to large amounts of information that could previously only be distributed on disk. Our cover crop database is linked to the Web in a way that is not possible with written materials, slide shows, or videos. The information is completely current and searchable. As soon as a SAREP staff member makes a change or update to the database the information is immediately and automatically available online to Internet users.

Visitors to our site and the thousands of other sites on the Internet are the real winners, however. Information is available online that previously wouldn't have been available. A journal editor, for example, may decide that a research paper will be pulled from the next issue because of space constraints. The paper, however, may be posted online by its author, in its entirety, plus photographs, charts and references that would never have been published in the paper-based journal. Another and maybe more significant advantage to Internet users is the fact that many Web sites index and provide a searching mechanism for all the information on their site. For example, our newsletters are indexed and searchable so visitors can quickly find the information they are looking for without having to scan through multiple issues. They can also find many other related information sources (i.e. papers, studies, project summaries) that may further assist them in their research.

The World Wide Web is becoming easier to use, but it is still evolving. New users often get frustrated when first attempting to access information online. New terminology and conventions can be overwhelming. Technologies are still being developed to assist in access and management of information on this dynamic medium. However, the Web currently offers enough information useful to farmers, researchers, policymakers and consumer for us to encourage you to experience the information available.

*Tom Bates, SAREP programmer/analyst*

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# UC Research on Cover Cropping- Reports Available

A report that includes more than 40 summaries of research projects relating to cover cropping is now available in print and through SAREP's Cover Crop Resource Page on the World Wide Web (http://www.sarep.ucdavis.edu). The summaries were compiled by former SAREP perennial cropping systems analyst Chuck Ingels, chair of the UC Cover Crops Workgroup. The workgroup, which includes 80 University of California personnel and several individuals from outside the university, was formed in 1994. Its purpose is to bring together UC Cooperative Extension farm advisors and specialists, DANR faculty and others to share information on cover cropping, determine the highest priority research and extension needs, and coordinate activities to fulfill these needs. The third annual workgroup meeting took place at UC Davis on March 21-22, 1996 in conjunction with the Sustainable Agriculture Farming Systems project's spring meeting. The purpose of the workgroup meeting was to train statewide UC and Natural Resources Conservation Service personnel.

The report contains summaries compiled for the last three workgroup meetings. (Summaries will be compiled every three years from now on.) Summaries are organized into "Annual Cropping Systems," "Tree & Vine Cropping Systems," and "Other Categories," which includes education summaries and a review of cover crop biology. One of the summaries is presented in the Technical Reviews section of this issue (see page 12).

To receive a copy of the report, send $5 (checks payable to "UC Regents") to: SAREP (CC Reports), University of California, Davis, CA 95616.

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# What's New on the Web

## UC Sustainable Agriculture Program Wins Bronze for Web Site

UC SAREP has won a bronze Circle of Excellence Award for its Internet World Wide Web site from the national Council for Advancement and Support of Education (CASE). The award honors the statewide program for accurately targeting its audience and communicating its mission via the Web site. "The World Wide Web is a great way to disseminate the scientific research we fund on sustainable ag practices and public policies to California farmers, researchers, consumers, policy makers, UC administrators, and government officials," says Bill Liebhardt, SAREP director. SAREP's staff of 10 contribute information to the site (http://www.sarep.ucdavis.edu) which is managed by Tom Bates, SAREP programmer/analyst. The site allows users to search for and view information on a cover crops database with 400 color images of plants, summaries of dozens of SAREP-funded research projects, hundreds of newsletter articles and calendar entries. "In these days of dwindling monetary resources, putting this information on the Web is an excellent and cost effective way to leverage work that is already being done," says Jill Shore Auburn, SAREP associate director.

## This is what the CASE judges had to say about the SAREP Web site:

Be prepared when you visit this site for a very different kind of Web experience. No cool graphics; no Javascript; no animations; no Quicktime or RealAudio. But that's precisely what the judges liked about this site: it didn't impose massive, unneeded media on its users (who were most likely connecting over very low-speed connections). Instead, it offered its audience a massive amount of information that they needed and made the information easy to find. The site has an excellent search engine and is very easy to use.

## Other Sites
## US Department of Energy's (DOE) Center of Excellence for Sustainable Development

http://www.sustainable.doe.gov/

The DOE's Office of Energy Efficiency and Renewable Energy Denver Regional Support Office is operating the Center of Excellence for Sustainable Development. To help communities design and implement sustainable development (good for the local economy, environment and quality of life), this new service will assist communities throughout the United States by providing world-class consultation and information. Federal, state, and local

agencies that assist community developers are also target customers.

## The Center for Sustainable Agricultural Systems

http://ianrwww.unl.edu/ianr/csas

The Center for Sustainable Agricultural Systems was formed in 1991 within the Institute of Agriculture and Natural Resources at the University of Nebraska-Lincoln for the purpose of bringing together people and resources to promote an agriculture that is efficient, profitable, and environmentally and socially sustainable. The Center uses a systems approach to address the complex and multidimensional challenges associated with a sustainable and profitable agriculture. This site has links to information about various aspects of the program including publications and reports, current activities, a calendar, and other sustainable-agriculture-related sites, including UC SAREP and SAN (http://www.ces.ncsu.edu/san), the communications and outreach arm of the USDA Sustainable Agriculture Research and Education (SARE) program.

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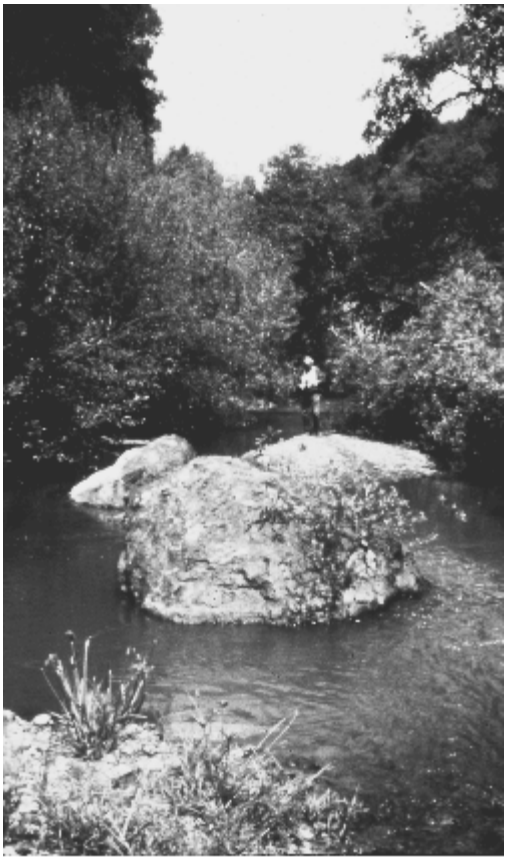
# Marin Coastal Watershed Project: Walter Creek is part of the Marin Coastal Watershed Enhancement Project.



Walter Creek is part of the Marin Costal Watershed Enhancement Project.

**A Cooperative Approach to Adapting Nonpoint Source Pollution Guidelines to Local COnditions**

*by Ellen Rilla, UC Cooperative Extension director, Marin/Sonoma counties, and Stephanie Larson, UC Cooperative Extension livestock and range management advisor, Marin/Sonoma counties*

*(Editor's Note: This is the first part of a two-part article on the Marin Coastal Watershed Enhancement Project, which was coordinated by Ellen Rilla and Stephanie Larson, and involved the work of many individuals in UC Cooperative Extension, the agricultural community, natural resources agencies, and environmental groups. Funding for the project was provided by the Marin Community Foundation.)*

The condition of riparian habitat in coastal Marin County has deteriorated significantly since the early part of this century. Agricultural practices are often cited as a primary cause of this habitat degradation. Public perceptions of agricultural practices and resultant criticism of agriculturists have polarized community factions and hindered cooperation in solving resource management problems. Some agricultural practices have undoubtedly contributed to resource degradation, but management is highly varied, and there are numerous examples of sound resource management on agricultural land in coastal Marin County.

Though agricultural management practices have greatly improved over the last 20 years, the viability of agriculture is threatened by an increasingly restrictive regulatory environment. In response to recent amendments to federal water quality laws, Regional Water Quality Control Boards will begin regulating nonpoint source (NPS) pollution on rangelands unless landowners

take voluntary steps to improve water quality.

Several watershed enhancement programs have been conducted in coastal Marin County since the early 1980s. Despite the benefits of these projects, they have primarily focused on repair of localized erosion problems, and they have not significantly affected agricultural management practices.

## Project Goals

The Marin Coastal Watershed Enhancement Project was designed to address the issue of NPS pollution on a local level. A primary focus of the project is to provide landowners with the resources that they need to demonstrate cooperative, voluntary compliance with water quality regulations. This approach will minimize regulatory involvement in local land management.

Project goals include improving water quality, fish habitat, and natural resources in western Marin County through voluntary adoption of appropriate management practices. Specific objectives of the project include helping landowners identify water quality problems, demonstrating existing examples of good management, providing information on management practices that maintain or improve water quality, and assisting with monitoring programs.

This two-year project was funded by the Marin Community Foundation, a local private foundation, between approximately March 1994 and March 1996. The Foundation was interested in funding a project that would bring stakeholders together for cooperative watershed enhancement, addressing their goals in the areas of environmental quality and land conservation.

## Nonpoint Source Pollution

Pollution is defined in the California State Water Code as "an alteration of the quality of the state waters by waste to a degree which unreasonably affects either of the following: (1) The waters for beneficial uses; (2) Facilities which serve these beneficial uses." The Federal Clean Water Act (CWA) identifies categories of pollution as either point source or nonpoint source. Point source pollution is an observable, specific, and confined discharge of pollutants into a water body. Examples of this kind of pollution include dairy waste ponds, food processing plants, and agrochemical processing plants. In contrast, NPS pollution consists of diffuse discharges of pollutants throughout the natural environment.

Nonpoint sources of pollution, including erosion, and, to a lesser degree, animal nutrient production, occur naturally at certain levels. However, common management practices increase these types of pollution. Nonpoint source pollution from rangelands can be exacerbated by grazing, road building, mining and recreational activities. Grazing can be a source of excessive sediment, nutrients, and pathogens. Animal concentration in riparian areas allows the direct deposition of nutrients and pathogens in waterways, and can cause streambank erosion and sedimentation.

Statewide and nationwide, sediment is considered to be the primary nonpoint pollution source on rangelands. However, in Marin County, because of the high concentration of livestock on dairies, animal waste is the greatest pollution concern from both point and nonpoint sources. Pollution of Tomales

Bay by dairy waste has increasingly become a focus of public concern because of its presumed negative effect on shellfish production, a $2 million dollar industry operating in Tomales Bay.

## Project Area

The project area encompasses the watersheds of three major coastal streams north of San Francisco, within Marin County. These include Walker Creek, Lagunitas Creek, and numerous smaller tributaries to Tomales Bay and the Marin County portion of Stemple Creek/Estero de San Antonio, which flows into Bodega Bay.

"Break-out" groups of farmers, ranchers, agency personell and UC Cooperative Extension advisors met regularly over the two years of the Marin Costal Watershed Enhancement Project.

The watersheds encompass approximately 232 sq. miles, or 148,480 acres, primarily in agricultural ownership. The Lagunitas Creek watershed is unique, with an estimated run of 500 Coho salmon documented, or ten percent of the state's current Coho population. The Walker Creek watershed drains into Tomales Bay, one of the prime remaining estuaries on the west coast. It is also listed as an impaired waterbody by the State Water Quality Control Board. Stemple Creek becomes the Estero de San Antonio, and is part of the Gulf of the Farallones National Marine Sanctuary. Federal lands within the Golden Gate National Recreation Area (GGNRA) and the Point Reyes National Seashore fall within the project area boundaries. These federal lands were not specifically addressed by the project at the onset, though park service staff actively participated in landowner outreach and education. With the change in park superintendents midway through the project, the boundaries of the study were expanded to include the park lands encompassing Olema Creek. The project area also encompasses proposed federal legislation which seeks to expand the seashore park boundaries by 38,000 acres by purchasing development rights from willing landowners.

The predominant agricultural use is characterized by dairy, sheep, and cattle operations ($40 million/year) interspersed with small commercial horse operations in rural residential settings. Conservation easements exist on 25,000 acres due to an aggressive campaign by the local Marin Agricultural Land Trust.

## Regulatory Agencies

Laws regulating NPS pollution have been in existence since 1977, but until recently, regulatory agencies have focused on controlling point sources of pollution.

In California planning and enforcement authority for NPS pollution is passed from the EPA, to the State Water Resources Control Board (State Water Board), then down to the nine Regional Water Quality Control Boards. In 1988, the State Water Board produced a nonpoint source management plan for the State of California. This plan outlines three management approaches for addressing NPS pollution problems. This is commonly referred to as the "three tiered" approach, where each enforcement tier increasingly emphasizes regulation. Tier One is described as "Voluntary Implementation of Best Management Practices," and encourages landowners to utilize available technical assistance to voluntarily assess and improve management practices that effect water quality. Tiers Two and Three involve enforcement actions from the Regional Board.

The Nonpoint Source Management Plan did not adequately address some nonpoint sources, and it is currently being amended. This process includes preparation of a rangeland grazing plan for California. The rangeland grazing plan will specify a strategy for either individual landowners or watershed management groups to address NPS
pollution on rangelands. This proposed strategy utilizes Tier One compliance and is based on the assumption that, if landowners demonstrate a significant effort to reduce water pollution through voluntary measures, enforcement will not be necessary. The primary element of this strategy is preparation of water quality management plans by all rangeland owners or operators.

The deadline for the State Water Quality Control Board to have a nonpoint source management plan that complies with federal water pollution laws was July 1995. There will be an eight-year time frame for implementation of this plan. By 2003, landowners will be expected to have significantly reduced NPS pollution through voluntary compliance.

## Agency/Community Involvement

An important aspect of the project is the cooperative effort of local government agencies and private support groups working together as a team to assist landowners with NPS pollution issues. Participating groups include the University of California Cooperative Extension, Natural Resources Conservation Service, the Marin Agricultural Land Trust, National Park Service, and the Marin County Resource Conservation District. To ensure that the project is practical and meets the needs of agriculturists, a local sheep and beef producer was hired to help with landowner outreach.

A team of six staff from these groups provide day-to-day project orchestration. This team approach eliminates program duplication, and the coordination of efforts assures efficient flow of information between regulatory agencies and land owners.

A thirty member advisory committee, made up of community representatives, producer groups (from shellfish growers to dairy operators), regulatory and resource agencies, and environmental organizations provides general guidance and oversight. The committee met at the onset of the project to discuss and amend project goals and objectives. Members are kept up-to-date on project progress with informational memos between meetings. Initial interviews were conducted with members prior to the project start-up as a partial assessment of their views of the problem, potential solutions and

possible pitfalls.

*(Part 2 of "Marin Coastal Watershed Project," which includes descriptions of landowner outreach, local compliance, and next steps, will appear in Vol. 8, No. 4, Fall 1996 of Sustainable Agriculture. See "Marin Project Products," next page.)*

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# Marin Project Products

The goal of the Marin Coastal Watershed Enhancement Project (see previous page) is to develop cooperative solutions to water quality issues in coastal Marin County. Materials developed by the project include a guide, a video, a series of fact sheets, and a status report on the coastal watersheds included within the scope of the project. Additionally, a collection of related articles on environmental enhancement through agriculture is available from Tufts University.

## Creek Guide

Creek Care: A Guide for Rural Landowners and Residents, 19 pages, 1995, UC Cooperative Extension. This guide is designed to encourage and support the stewardship of creeks in coastal Marin County, and is being adapted for use in the Russian River Watersheds in Sonoma County and for the urban side of Marin County. It is a component of the Marin Coastal Watershed Enhancement Project and includes sections on healthy creeks, riparian corridors and uplands, and guidelines for improving creek health. Single complimentary copies of the guide are available from UC Cooperative Extension, 1682 Novato Blvd., Suite 150B, Novato, CA 94947; (415) 899-8620.

## Video

Downstream: Planning for the Future of Marin Coastal Watersheds, 14 minutes, 1995, UC Cooperative Extension, Marin Community Foundation, Marin Agricultural Land Trust, $20. This tape is a teaching companion for ranch planning and is suitable for any audience interested in a balanced view of water quality issues in agriculture or addressing the problem of nonpoint source pollution. It identifies and shows solutions to these problems and introduces the concept of voluntary compliance with water quality law through written ranch plans. Filmed along the Marin County coastline, it is available through UC Cooperative Extension. Send checks for $20 payable to "UC Regents" to **Stephanie Larson**, UCCE, 2604 Ventura Ave., Rm. 100, Santa Rosa, CA 95403; (707) 527-2621.

## Fact Sheets

Various fact sheets related to the Marin Coastal Watershed Enhancement Project are available from the agencies involved. Titles include: Designing Feeding and Watering Areas to Avoid Nonpoint Source Pollution, Funding Conservation Projects, Ranch Maps, Recognizing Nonpoint Pollution Sources on Ranches, Photographic Monitoring, Planting Willows, Vegetation Monitoring, Water Quality Checklist, Water Quality Laws and Local Application, Water Quality Variables, Water Testing for Rural Landowners,

and Writing Ranch Plans. Single complimentary copies are available from Marin Agricultural Land Trust, PO Box 809, Point Reyes Station, CA 94956, (415) 663-1158; Marin County Resource Conservation District, PO Box 219, Point Reyes Station, CA 945956, (415) 663-1231; Natural Resources Conservation District, 1301 Redwood Way, Suite 170, Petaluma, CA 94954, (707) 794-1242; Point Reyes National Seashore, Range Conservationist, Park Headquarters, Bear Valley Road, Point Reyes Station, CA 94956, (415) 663-8525; and the University of California Cooperative Extension offices at 2604 Ventura Ave., Santa Rosa, CA 95403, (707) 527-2621, and 1682 Novato Blvd., Novato, CA 94947, (415) 899-8620.

## Conference Proceedings

Environmental Enhancement Through Agriculture, 1995, $20. Includes the paper by **Ellen Rilla** and **Stephanie Larson** of UC Cooperative Extension excerpted in this issue of Sustainable Agriculture. This volume develops the idea of an agriculture that serves the environment rather than conflicting with it. Its 36 papers offer examples of agricultural systems that benefit the environment in diverse ways: increasing wildlife habitat and biodiversity; protecting water quality in streams and estuaries; producing substitutes for nonrenewable energy sources; turning urban waste into a resource instead of a problem; offering aesthetically appealing landscapes; and bringing urban residents into closer contact with food production and the land. The papers are from a conference in Boston, Mass., in November 1995 sponsored by the Tufts University School of Nutrition Science and Policy, the American Farmland Trust, and the Henry A. Wallace Institute for Alternative Agriculture. Copies are $20, postpaid. Send checks (US funds only) payable to "Trustees of Tufts College" to Center for Agriculture, Food and Environment, School of Nutrition, Science and Policy, Tufts University, Medford, MA 02155.

*(More information can be obtained on this project and others through the California Watershed Projects Inventory homepage, located at http://ice.ucdavis.edu. The database provides a tool for sharing information about watershed projects throughout California. Marin Project Products*

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# SAREP Turns 10: New PAC/TAC Members Join

It's been almost ten years since September 26, 1986, the day California Governor **George Deukmejian** signed Senate Bill 872 into law. Sponsored by Senator **Nicholas Petris** of Oakland, the bill enacted the Sustainable Agriculture Research and Education Act of 1986, which requested the Regents of the University of California to establish the Sustainable Agriculture Research and Education Program (SAREP). Petris carried the bill in response to farmer, consumer and researcher concerns that California farming practices be more ecologically sound, economically profitable and socially responsible.

SB 872 charged newly created SAREP with administering a competitive research grants program for sustainable agricultural practices and public policies, developing and disseminating new and existing information on sustainable practices, and coordinating long-term farmland research. The program found a home at UC Davis, its first public and technical advisory committees were selected, and the first Request for Proposals for grants went out in early 1987. In March of that year **Bill Liebhardt** was selected SAREP director, the first grants were awarded to eight projects, and the program was on its way.

"We have always used the enacting legislation as our blueprint," said Liebhardt. "In the last ten years, SAREP has awarded more than $2.8 million to approximately 200 basic and applied research projects, economic and public policy projects, seminar and field demonstrations and graduate student awards. It has also provided the seed money for the first long-term irrigated farmland study in a Mediterranean climate anywhere in the world."

SAREP administers a second funding program to help farmers reduce their use of pesticides and synthetic fertilizers, called the Biologically Integrated Farming Systems (BIFS) program.

SAREP's enabling legislation requires it to have both public and technical advisory committees to advise the university on program goals and make recommendations on the award of competitive grants. The Public Advisory Committee (PAC) includes individuals actively involved in agricultural production, as well as representatives from government, public organizations, and institutions of higher education. The Technical Advisory Committee (TAC) is made up of universitywide faculty and staff with knowledge and experience related to sustainable agriculture and makes recommendations about the scientific merit of grant applications. Each PAC or TAC members serves for three years. New members in 1996 are listed here.

**Public Advisory Committee**

**JENNY BROOME** is an environmental research scientist at the California Department of Pesticide Regulation. Her areas of expertise include plant pathology, epidemiology and management of fungal diseases of plants. She is interested in cultural and biological control of plant pathogens, the use of weather/microclimate monitoring to guide plant disease management, integrated pest management, environmentally and socially just agriculture, and viticulture.

**CYNTHIA CORY** is the director of marketing and commodities for the California Farm Bureau Federation, and works with the state legislature and agencies on agricultural issues. She focuses on marketing, commodity, and transportation issues that facilitate getting California ag products off farms and ranches into marketing channels and ultimately to consumers. She works with a diverse set of concerns that range from emu ranching to drug and alcohol testing of commercial truck drivers. One of her particular interests is in developing relationships between different sectors of agriculture and between urban and rural communities.

**DAVID COSTA** is a managing partner of a family farm in Lemoore, Kings County which produces upland cotton, pima cotton, corn, wheat, barley and alfalfa using conventional farming methods (with an emphasis on reduced chemical inputs), cover crops and manures. Licensed as both an agricultural and civil engineer, Costa would like farming to remain a viable income-producing industry in California, and to that end, wants to see issues like urban sprawl and over-regulation addressed. He serves on various water boards and is a director of the local Resource Conservation District board. His family ranch cooperated with the UC in a six-year potassium deficiency study which resulted in a major change in the way cotton and other commodities are farmed.

**LEONARD DIGGS** is the owner/operator of Leonard Diggs Organic Farms, a small organic operation in Sonoma County. He raises vegetable crops including salad mix, tomatoes, specialty peppers, and strawberries. The winner of the UC Small Farm Program's 1996 Pedro Ilic Award for Outstanding Farmer, Diggs is particularly interested in agricultural education. He has taught gardening to elementary level students, teaches specialty crop production at the junior college level, and is hoping to teach high school "life skills" classes to show young people how science and the humanities affect their lives. Diggs serves on the Sonoma County Solid Waste Board, the Sonoma County Agriculture Literacy Project, the Sonoma County Farm Bureau board, the UC Small Farm Program Advisory Committee, and is active in the North Coast chapter of California Certified Organic Farmers.

**JAMES LIEBMAN** is Staff Scientist at the Pesticide Action Network North America Regional Center (PAN) in San Francisco, part of an international network of citizens' organizations working to end pesticide dependence and promote safe and sustainable pest control. Trained as a plant pathologist, Liebman has worked extensively on the ecology and control of agricultural soil fungi, and in agricultural policy. Prior to his work at PAN, Liebman worked at the Environmental Health Policy Program at the UC Berkeley School of Public Health where he analyzed pesticide use in California and proposed adoption of a statewide pesticide use reduction program. He also has worked to assess and promote alternatives to the soil fumigant methyl bromide. He is a contributing editor to the IPM Practitioner and a member of

the Materials Review Committee of the California Certified Organic Farmers.

**BROCK TAYLOR** is the agronomist/assistant manager of Vaquero Farms in Stockton, San Joaquin County. He is responsible for all water and fertilizer management decisions for processing tomatoes, cotton, garlic and onions, and coordinates production trials and technological innovations to produce consistent profitable production levels and maximize resource use. A public member of the California Department of Food and Agriculture's Fertilizer Inspection Advisory Board and an executive member of the Fertilizer Research and Education Subcommittee, Taylor is particularly interested in agricultural economics and production management. He has also done agronomic consulting in Thailand, Australia and New Zealand.

**MICHAEL STRAUS** handles marketing and sales in his family's Marin County organic dairy. Straus Family Creamery is the first organic dairy in the western United States, and family members are working to promote sustainable agriculture in the dairy business. Straus is interested in sustainable communities, particularly as they relate to agriculture, the environment, and business. He is a Marin Conservation League board member, and likes ice cream.

**Technical Advisory Committee**

**TIM HARTZ** is an Extension Specialist with the vegetable crops department at UC Davis. His areas of expertise include irrigation and fertility management and general cultural management of vegetable crops. He is particularly interested in water use, cost and availability; groundwater protection; and soil quality.

**CRAIG KOLODGE** is the superintendent of the UC Bay Area Research and Extension Center and the county director for Santa Clara County UC Cooperative Extension. A plant pathologist by training, Kolodge worked as a private consultant in pest management and as a research and development scientist for an agrochemical company prior to joining UC Cooperative Extension. He is particularly interested in urban-based sustainable agriculture education; alternative systems of plant disease control; and start-up farming enterprises for urban individuals.

**TERRY PRICHARD** is an Extension water management specialist for the UC Davis Department of Land, Air and Water Resources. His specialties are irrigation water management, water infiltration, crop water requirements, crop response to limited water supplies, water quality, and soil salinity. Current specific research interests include improvement of vine quality through irrigation management, and the use of cover crops to deplete spring soil moisture.

**JANET SAVAGE** is the field program supervisor and an instructor in public health nutrition at the UC Berkeley School of Public Health. She is particularly interested in community food security, regional food systems, and biotechnology (specifically recombinant DNA) and its impact on sustainable food systems.

**ROBERT L. "ROB" THAYER, JR**. is a professor of landscape architecture at UC Davis, and is a practicing land planner, researcher and

author. His research focuses on resource conservation strategies for regional land planning and the theoretical, perceptual, and practical basis for sustainable landscape design and development. He is particularly interested in the intersection between agricultural, habitat, open space, and urban land uses. He is committed to the notion of regional ecological realism, also known as "bioregionalism," and is concerned about what agricultural land and landscape patterns are sustainable over the long-term in particular ecological regions. He has won eight awards from the American Society of Landscape Architects, including the ASLA Presidential Award of Excellence for his 1994 book Gray World, Green Heart: Technology, Nature and the Sustainable Landscape.

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# Conference to Showcase Community Food System Collaborations

*by Dave Campbell and Gail Feenstra, SAREP*

The relentless pace of global economic integration and dramatic changes in national agricultural policy are reshaping how food is produced, processed and distributed. One response to these changes has been an increasing interest in "community food systems." This approach seeks to build community within a neighborhood, city or region by implementing strategies to increase the self-reliance of the regional food economy. Across California, local collaborations are creating new ties among farmers, civic organizations, non-profit groups, consumers and elected officials.

To showcase the most innovative collaborations and to explore the many questions surrounding their development, SAREP, the Community Alliance with Family Farmers, the Community Food Security Coalition, and the UC California Communities Program will host a conference Oct. 2-3, 1996 at UC Davis. "Community Food Systems: Sustaining Farms and People in the Emerging Economy" will feature:

- Keynote addresses that articulate why a renewed experience of community is essential to civic vitality and economic prosperity in the years ahead;
- Panel presentations of innovative community food system projects from across California, including SAREP-funded projects;
- Plenaries that describe coalitions, institutions and businesses that can promote the long-term sustainability of community food systems;
- Workshops in which to learn and share practical skills for developing community food systems;
- Time for networking and building bridges of cooperation among allies;
- Social time, food, culture and entertainment at the famous Davis Farmers' Market;
- Delicious lunches prepared from locally grown foods.

The conference is intended for a diverse audience, including representatives of community-based organizations, Cooperative Extension, farmers, university faculty, anti-hunger and food security representatives, farmers, market personnel, consumers, community gardeners, economic development planners, local government officials, religious groups, environmentalists and others interested in developing more practical and comprehensive solutions to food and agricultural problems.

Pulitzer-prize wining poet Gary Snyder will read his poetry at a luncheon featuring local foods. Invited speakers include: Sharon Junge, UC Cooperative Extension, Placer County; Mohammed Nuru, San Francisco League of Urban Gardeners; Janet Brown, organic farmer, Marin Food and

Agriculture Group; Frank Tamborello, Interfaith Hunger Coalition; Bryce Lundberg, Lundberg Family Farms; Susan Temple, Fiddler's Green Farm; Don Villarejo, California Institute for Rural Studies; Doris Bloch, Los Angeles Regional Food Bank; Bob Gottlieb, UCLA Department of Urban Planning; Kai Siedenburg, California Sustainable Agriculture Working Group; Ellen Rilla, UC Cooperative Extension, Marin-Sonoma counties; and Joyce Ewen, Pomona-Inland Valley Council of Churches.

Invited workshop presenters include: Lynn Bagley, Marin County Farmers Market Association; Marion Kalb, Southland Farmers' Market Association; Michael Dimock, Sunflower Strategies; Glenn McGourty, UC Cooperative Extension, Mendocino County; Andy Fisher, Community Food Security Coalition; Susan Ornelas, Arcata Farm and Education Project; and Ken Hecht, California Food Policy Advocates.

**Keynote Speakers**

Keynote speakers include Joan Dye Gussow, professor emeritus and former chair of the nutrition Education Program at Teachers College, Columbia University; Daniel Kemmis, mayor of Missoula, Mont., former speaker of the Montana House of Representatives and author; and Fred Kirschenmann, manager of Kirschenmann Family Farms in North Dakota, a member of the National Organic Standards Board and author.

For more information and to register for the conference, contact SAREP at (916) 752-7556 or e-mail sarep@ucdavis.edu or visit the conference web site (http://www.sarep.ucdavis.edu)

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Summer, 1996 (v8n3)

# UC SAREP Co-sponsors Conferences

**California Farm Conference Set for Riverside**

The 14th Annual Farm California Conference will be held February 23-25, 1997 at the Riverside Convention Center. Farm Conference is the oldest and one of the largest statewide gathering of family farmers. This year's conference will focus on alternative marketing, sustainable production practices, and new ideas to make the family farm successful. Activities include bus tours of the local agricultural area, short courses, a trade show, a regional tasting, plenary speakers and more than 400 workshops. The 1997 Farm Conference is sponsored by UC SAREP, the California Federation of Certified Farmers' Markets, the Community Alliance with Family Farmers, Marin County Farmers Market Association, the UC Small Farm Center, Southland Farmers' Market Association, the Ventura County Certified Farmers' Markets and Riverside County Cooperative Extension. For registration information, contact Mary Lou Weiss at (310) 618-2930.

**California Biosolids Conference**

The 1997 California Biosolids Conference is scheduled in Sacramento, Calif. January 29-30, 1997. It will provide the opportunity for agricultural, academic, regulatory, environmental and wastewater treatment interests to share practical information and exchange views on the use of biosolids (treated sewage sludge) as a fertilizer and soil amendment in agriculture. Particular attention will be given to specific conditions in California. Topics will include crop and soil responses to biosolids; institutional, legal, liability and economic issues; and practical experiences with biosolids. The conference is sponsored by the California Department of Food and Agriculture, the California Environmental Protection Agency, UC SAREP, the California Water Environment Association, and the Central Valley Wastewater Managers Association. For registration information contact Brett Moroz at (209) 333-6749 or Woodie Woodruff at (209) 847-4322.

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# SAREP Staff Changes

After nearly seven years with SAREP, Chuck Ingels has taken a new job as UC Cooperative Extension farm advisor in Sacramento County. Ingels was SAREP's perennial cropping systems analyst. His many accomplishments during his tenure with SAREP include his work to form the UC Cover Crops Workgroup (see page 2), his development of information on attracting barn owls to farms, his participation as a management team member for the Biologically Integrated Orchard Systems (BIOS) program for walnuts in Yolo and Solano counties, and his production of the UC publication Protecting Groundwater Quality in Citrus Production (ANR Publication No. 21521). Ingels is also coordinating the writing of Cover Cropping in Vineyards: A Grower's Handbook, an extensive publication which will include contributions from 21 UC and Natural Resources Conservation Service personnel; it is expected to be published by UC ANR Publications in 1997.

Ingels' areas of responsibility as a Sacramento County farm advisor will include pomology (mainly pears), viticulture, and environmental horticulture. He will also coordinate Sacramento's large Master Gardener program. Ingels is replacing Roger Duncan, who is now a pomology/viticulture farm advisor in Stanislaus County.

Ingels' extensive experience working with farmers and researchers throughout the state, his mediation skills, thoughtful and conscientious manner, tremendous writing output and seemingly endless energy will be sorely missed by his colleagues at SAREP. We send him off with our best wishes for a successful career, and are happy that he is staying in the "Cooperative Extension" family.

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***RESOURCES***

## Almond Guide

*BIOS for Almonds: A Practical Guide to Biologically Integrated Orchard Systems Management*, 104 pages, Community Alliance with Family Farmers (CAFF) Foundation and the Almond Board of California, 1995, $10 (tax included). The knowledge and experience of innovative California almond growers, researchers and pest control advisers is available in this training guide which provides step-by-step information for taking a biological approach to almond management. Intended readers include farmers, consultants, farm advisors and others involved with commercial almond production in California. In addition to sections on cover crops, irrigation, mowing, navel orangeworm management, beneficial insects, and monitoring and sprays, commonly asked questions about almond production are addressed. To order, contact CAFF at Tel: (916) 756-8518; Fax: (916) 756-7857.

## Organic Cotton Study

*Production Practices and Sample Costs for Organic CottonNorthern San Joaquin Valley*, 1995, 23 pages, by **Karen Klonsky**, **Laura Tourte, Sean Swezey**, and **David Chaney**. (Reviewed in Technical Reviews, page 15). Other contributors include UC Cooperative Extension farm advisors and growers. This new organic cost-of-production study is available from UC Cooperative Extension. It includes information on production and processing practices, risk and marketing, state and federal regulations, sample cost and return estimates, and enterprise budgets. Other organic cost-of-production studies are avaiable for apples, coastal vegetables, almonds, wine grapes, rice and walnuts. For complimentary copies, contact Laura Tourte, Department of Agricultural and Resource Economics, University of California, Davis, CA 95616; Tel: (916) 752-9376; Fax: (916) 752-5614 or e-mail: tourte@primal.ucdavis.edu The publications are also available in selected UC Cooperative Extension offices.

## Gardening/Greening Directory

*The Bay Area Urban Gardening and Greening Directory*, 20 pages, $3. Produced by the Center for Urban Education about Sustainable Agricutlure (CUESA), this directory lists 150 projects and organizations involved in gardening and greening in the San Francisco Bay Area and includes sections on children's gardening and cooking, farmers' markets, community gardening, horticultural job training. To order, send $3 (checks payable to CUESA) to CUESA, 1417 Josephine St., Berkeley, CA 94703; Tel: (510) 526-2788; Fax: (510) 524-7153; e-mail: sfpmc@igc.apc.org

## Farmers' Markets

*Farmers Markets '96: The What's Hot/What's Not Guide for Growers and Managers*, by **Eric Gibson**, New World Publishing, 1996, 12 pages, $4. This report, by the author of Sell What You Sow! The Grower's Guide to Successful Produce Marketing, provides the latest tips and trends, including popular products (fresh and value-added), best display ideas, merchandising and selling tips, and farmers' market promotion ideas. To order, send $4 plus $1 shipping and handling to New World Publishing, 3085 Sheridan St., Placerville, CA 95667 (Calif. residents add $0.29 sales tax). Credit card orders available at (916) 622-2248. The report may also be ordered from the Internet Web site http://eldorado.ca.us/~newworld (in "The Farmers' & Gardeners' Resource Catalog" section).

## Pesticide Report

*1994 Summary of Pesticide Use Report Data, Cal/EPA Department of Pesticide Regulation (DPR)*, 345 pages, $10 printed, or $2.50 for diskette. This report summarizes data reported to DPR on the amount of pesticide active ingredients used in California, including types of crops or kinds of application sites (e.g., structures, roadsides). The Summary of Pesticide Use Report Data is available in two formats: one is indexed by the name of each pesticide active ingredient; the other indexed by commodity with pesticides listed. Printed copies are available from DPR for $10 each. Each summary is also available on diskette in WordPerfect 6.0a or ASCII. The cost is $2.50 for either the commodity or chemical diskette report. To order, send payment to: Cashier, California Department of Pesticide Regulation, 1020 N Street, Sacramento 95814-5624. The data summaries can also be downloaded at no cost from the publications section of DPR's Internet Web page: http://www.cdpr.ca.gov

## Mill Tax Report

*Taxing Pesticides to Fund Environmental Protection and Integrated Pest Management*, by **William Pease**, **James Robinson** and **Daniel Tuden**, 1996, 36 pages, $10. This report looks at the California mill tax, a 2.2 percent tax on pesticides that will soon be reduced. It finds that past mill tax increases only minimally affected food prices or demand for pesticides while providing significant revenue to California. It contends that the mill tax is the most politically feasible instrument for funding pesticide regulation and integrated pest management and discusses possible ways to raise mill tax and allocate revenues. To order, mail $10 to California Policy Seminar, 2020 Milvia Street, Suite 412, Berkeley, CA 94704; Tel: (510) 642-5514; Fax: (510) 642-8793; e-mail: ca.polsem@ucop.edu

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# Sources of Funding

### SAREP Grants

For the ninth year, UC SAREP is offering funding for research and education grants that lead to production or policy alternatives for the agricultural community which support environmentally and economically sound production and food systems. This year SAREP is offering approximately $200,000 in grant money for crop or livestock production options; environment and natural resources; marketing, consumer education and community food systems; and labor, land use and other community development and public policy issues. Small grants are being offered for graduate student support ($2,000 per individual) and educational meetings ($1,000 per meeting). The deadline for applications is August 1, 1996. The Request for Proposals (RFP) is available by mail or via the World Wide Web (http://www.sarep.ucdavis.edu). The RFP has been sent to everyone on SAREP's mailing list. If you have not received an RFP, contact SAREP at (916) 752-7556 or e-mail the office at sarep@ucdavis.edu

### USDA-SARE Western Region

The U.S. Department of Agriculture's Western Region Sustainable Agriculture Research and Education, SARE, program has set July 23, 1996 as the start date for three of its competitive grants efforts, including:

- **Sustainable Agriculture Research and Education, SARE, grants for sustainable agriculture research; Deadline: October 29, 1996**.The SARE grants program continues to target funding to whole-farm/ranch systems projects that increase understanding and adoption of sustainable agriculture. Projects qualify as whole-system research by addressing weak links or information gaps in a system, or by assessing the multiple impacts of different components of agricultural systems.
- **Agriculture in Concert with the Environment, ACE** (a joint venture of USDA and the US-EPA), grants for research on agricultural practices that minimize environmental effects and hazards; Deadline: **October 29, 1996**. The ACE program is requesting proposals for research and education projects that will lead to reduced environmental stress from agricultural practices. Priority issues for ACE funding in the Western Region will likely include irrigated agriculture; nutrient management; environmentally-sound multiple land uses; and animal waste management.
- **Professional Development Program** grants to develop materials and approaches to help
  Cooperative Extension Service, Natural Resource Conservation Service and other professionals expand their understanding of sustainable agriculture. Deadline: November 26, 1996. The professional development program is asking for project proposals that will improve

the ability of Cooperative Extension, NRCS and other agricultural professionals to conduct educational programs and activities in sustainable agriculture. Project subject matter can deal with any agricultural endeavor, and may include material on the effects of sustainable practices on the quality of life for farmers, ranchers and rural communities. Projects can be designed for agents working in production agriculture, 4H/youth development or other areas.

Note: For information on any of the three grant proposals, call the Western SARE office at Utah State University at (801) 797-3537 to add your name/institution to the distribution list for Calls for Proposals, or to request application materials after July 23, 1996. For other information, contact Kristen Kelleher, communications specialist (916) 752-5987; kkelleher@ucdavis.edu. The regional call for research proposals from area producers or producer groups is not set for release until November 5, 1996. However, please feel free to contact the Western SARE office to add your name to the specialized mailing list for western farmers and ranchers. The Western Region includes Alaska, American Samoa, Arizona, California, Colorado, Guam, Hawaii, Idaho, Micronesia, Montana, Nevada, New Mexico, N. Mariana Islands, Oregon, Utah, Washington and Wyoming.

**Organic Research Grants**

The Organic Farming Research Foundation is offering funds for organic farming research, dissemination of research results to organic farmers and growers interested in making the transition to organic production, and consumer education on organic farming issues. Projects should involve farmers in design and execution, and take place on working farms when possible. Proposals of $3,000-$5,000 are encouraged. Matching funds and/or in-kind contributions are recommended. Proposals are considered twice a year; the next round of proposals must be received by July 15, 1996. To receive copies of grant application procedures and the OFRF Research and Education Priorities describing target areas, write Grants Program, Organic Farming Research Foundation, PO Box 440, Santa Cruz, CA 95061; Tel: (408) 426-6606.

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Summer, 1996 (v8n3)

# Phacelia, Lana woollypod vetch, and Austrian winter pea: three new cover crop hosts of Sclerotinia minor in California.

*Steven T. Koike, Richard F. Smith, Louise E. Jackson,*
*Lisa J. Wyland, John I. Inman, and William E. Chaney*

*Ingels, Chuck (Editor). University of California Cover Crop Research & Education Summaries. University of California, Sustainable Agriculture Research and Education Program, Davis, CA. 1996*

*Editor's note: The following article is reprinted from the University of California Cover Crop Research and Education Summaries, March 1996 prepared by former SAREP Perennial Cropping Systems Analyst Chuck Ingels. To obtain a copy of the summaries contact SAREP at (916) 752-7556 or view them on the SAREP homepage (http://www.sarep.ucdavis.edu).*

Because cover crops contribute to soil fertility and offer possible pest management benefits, farmers in the Salinas Valley have recently shown renewed interest in alternative cover crops for both conventional and organic vegetable production and have begun considering newly utilized cover crop species such as phacelia (Phacelia tanacetifolia) and oilseed radish (Raphanus sativus).

However, the impact of phacelia, oil seed radish, and other cover crops on populations of Sclerotinia minor, the causal agent of the disease lettuce drop, is not known. Because of the extensive lettuce industry in the Salinas Valley, information was needed on the interaction of new cover crop introductions and S. minor. The purpose of this study was to test cover crop species for susceptibility to S. minor and to
assess the effect of cover crop plantings on lettuce drop incidence in field situations.

## Procedures

Our two-year field study and greenhouse inoculation experiments identified three cover crops as new hosts of S. minor. Pathogenicity was established by planting four-week-old transplants of six cover crops and lettuce into sand amended with sclerotia (35 sclerotia/100-cm3 sand). After four weeks incubation in a greenhouse, phacelia, Lana woollypod vetch (Vicia dasycarpa), and Austrian winter pea (Pisum sativum L. ssp. arvense) became infected in addition to lettuce. S. minor was reisolated from the diseased cover crop plants. To assess susceptibility in a field situation, seven cover crop species, lettuce, and fallow control treatments were planted for two consecutive years into randomized, replicated field plots infested with sclerotia.

## Results

In both 1993 and 1994 experiments (see Table 1), phacelia, Lana woollypod vetch, purple vetch (Vicia benghalensis), Austrian winter pea, and lettuce became infected and the pathogen was isolated from field samples. Numbers of sclerotia in soil samples from cover crop plots were not significantly higher than those from fallow plots. When lettuce was planted after cover crop incorporation, phacelia, Lana woollypod vetch, and Austrian winter pea plots had significantly higher lettuce drop incidence than fallow plots in the first year. In the second year, only phacelia plots had significantly more lettuce drop. This is the first report of S. minor as a pathogen of phacelia, Lana woollypod vetch, and Austrian winter pea cover crops in California.

Conversely, greenhouse and field inoculations failed to result in S. minor infections of oilseed radish, barley, and favabean cover crops. For both 1993 and 1994 field experiments, lettuce drop incidence in these three cover crop treatments was not significantly different than that for fallow treatment plots.

Funding for this research was provided by SAREP, and by the USDA-EPA A.C.E. Project 91-COOP-1-6590. We thank H. Agamalian, S. Dacuyan, T. G. Gonzales, E. D. Oakes, J. Taylor, M. Vidauri, and Hartnell College.

For more information contact: Steve Koike, UC Cooperative Extension, 1432 Abbott St., Salinas, CA 93901.

**Table 1. Disease incidence caused by Sclerotinia minor, sclerotia per 100 gram soil, and lettuce drop incidence for field trials in 1993-1994**

| | **Percent disease (1)** | | **Mean no. sclerotia/100g soil (2)** | | **Percent lettuce drop disease (3)** | |
|---|---|---|---|---|---|---|
| Cover crop | 1993 | 1994 | 1993 | 1994 | 1993 | 1994 |
| Phacelia | 13.9 | 21.4 | 3.4 | 7.2 | 20.6 | 39.4 |
| Oil seed radish | 0.0 | 0.0 | 0.0 | 2.8 | 14.8 | 24.3 |
| Barley | 0.0 | 0.0 | 0.6 | 1.4 | 11.2 | 18.0 |
| Lana woollypod vetch | 18.4 | 27.4 | 5.0 | 8.0 | 22.6 | 31.9 |
| Purple vetch | 17.2 | 19.0 | 2.6 | 7.2 | 17.2 | 26.5 |
| Fava bean | 0.6 | 0.0 | 6.2 | 2.8 | 8.4 | 18.6 |
| Austrian winter pea | 30.3 | 36.5 | 3.2 | 4.6 | 32.4 | 27.7 |
| Romaine lettuce | 96.9 | 82.0 | 29.0 | 6.6 | 23.4 | 25.4 |
| Fallow control | 0.0 | 0.0 | 1.8 | 3.0 | 11.4 | 18.9 |
| L.S.D.(P =0.05) | 5.5 | 8.0 | 11.9 | N.S. | 9.2 | 13.1 |

*(1) Ratio of the number of plants infected with S. minor to the total number of plants evaluated, expressed as percentages. In each replication, plants were evaluated in four 1-m2 sections and the values averaged.*

*(2) Mean number of sclerotia per 100 g soil sample. Samples were collected*

*just prior to the planting of the lettuce crop. Eight soil cores were taken per plot and bulked into a composite sample. Samples were processed and assayed for S. minor sclerotia.*

*(3) Ratio of the number of lettuce plants infected with S. minor to the total number of plants evaluated, expressed as percentages. All lettuce plants in the 5-m X 2-m bed plots were evaluated and the values averaged.*

*(DEC.540)*
*Contributed by Steven Koike*

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# Seasonal and local diets: consumers' role in achieving a sustainable food system.

*Jennifer Wilkins*
*Research in Rural Sociology and Development 6:149-166. 1995*

*Reviewer's note: This article offers a succinct overview of the forces influencing the current globalized, resource-intensive food system and the trend toward a more sustainable food economy. It suggests that achieving a more sustainable food and agricultural system is an appropriate goal for consumers and offers specific educational strategies for doing so. Many of the issues and questions discussed in this article will be considered in greater detail from a California perspective at the SAREP fall conference, Community Food Systems: Sustaining Farms and People in the Emerging Economy(see article, page 10).*

Although current dietary guidelines for the public have generally been based on nutrient requirements and disease prevention, Wilkins suggests in this article that emerging concerns with ecological sustainability are becoming increasingly relevant for influencing dietary change. In fact, Wilkins says, goals to improve food system sustainability are completely consistent with those that promote individual nutritional health.

Gussow and Clancy (1986) first suggested the term, "sustainable diets" to describe an eating pattern based on the Dietary Guidelines that would contribute to personal health as well as to the sustainability of the food and agricultural system. One of the primary assumptions underlying a "sustainable diet" is that foods are produced, processed and distributed as locally as possible. This approach would support more regional agricultural systems that preserve farmland and community economic viability, require less energy for transportation and offer consumers the freshest, ripest foods from the region. In the context of the current, centralized food system where most foods in commercial outlets travel thousands of miles, where export markets and the concept of "comparative advantage" play a large role in production decisions and where consumers are generally unaware of the sources of their food, such a sustainable diet may be hard to achieve.

Nevertheless, a growing number of researchers and sustainable agriculture groups are exploring alternative models for educating consumers about more local, sustainable diets. The "foodshed," loosely analogous to a watershed, has surfaced as one conceptual way to think about the origins and destinations of foods in a particular region. Additionally, the regional Sustainable Agriculture Working Groups (SAWGs) have promoted diverse, decentralized production, coupled with value-added local marketing and consumer education about a more sustainable, local food system in various policy proposals.

Wilkins suggests this renewed interest in regional food systems may be stimulated by a growing awareness of corporate control and concentration in the food and agricultural system and its effects on farmers' diminishing share of the food dollar. Another factor influencing consumers' interest is that in many parts of the United States, more than 70 percent of consumers' food supply is imported from outside the region, making them dependent on other areas for their food. A third factor contributing to an interest in building a more self-reliant food system is the concern that the current food system depends so heavily on a continuous supply of cheap oil (for agricultural chemicals, transportation, and food processing) and, in some farming regions, cheap water. If environmental and transportation costs were more fully accounted for, Wilkins suggests that areas that now claim a comparative advantage in food production may change. Further, if demand for fruits and vegetables increases as current nutritional recommendations advise, regional vs. global responses to expand supply could be very different depending on whether global accessing or local diversification are promoted. These options pose significant differences in terms of costs and impacts to regional agricultural production, processing and the economic vitality of particular communities.

**Benefits and Barriers of Eating from the Foodshed**

According to Wilkins, one of the most important benefits of increasing regional food self-reliance is the opportunity to educate consumers about the "carrying capacity" of a particular region. (Reviewer's note: Carrying capacity is the population that a particular region can support sustainably.) In addition, there is the potential for economic renewal and a strengthening of farmland preservation policies as a result of stronger local markets for growers and processors. Greater regional self-reliance also decreases the current concentration in the food system and potentially improves local food security.

There are also potential disadvantages or barriers to increasing regional food self-reliance. First, product variety, especially in some parts of the country during the winter months, will be limited and consumer acceptance may be minimal. A second and related concern is the nutritional adequacy of a regionally-based diet. Achieving nutritional objectives is possible in more locally-based food systems, but will probably require significant consumer education. Third, a more locally-based diet would diminish markets from other areas, especially markets in less developed countries, potentially resulting in negative consequences for their local economies. And last, if attempts were made locally to continue providing the same year- round diversity of fruits and vegetables we have within our current food system, it could result in farmers using unsustainable practices or levels of inputs that result in damage to the environment.

**Consumer Education and Research**

Since a shift to a more regional food system would require significant dietary changes for many consumers, a willingness to consider these changes is necessary. For example, a more local diet would mean less fresh fruits and vegetables during certain times of the year, and require that consumers change their cooking habits and increase their knowledge of the availability of seasonal foods. In addition, for most consumers, few links are made

between their food choices and the larger environmental, economic and social consequences of the food system. Wilkins suggests that information regarding place of origin and growing methods is important for consumers to have and use in their food choices. More information on labels could help in this regard. Policies that support education about how to purchase, plan and prepare meals based on locally available foods are needed. Regional food guides are examples of this strategy. Other policies that support direct marketing strategies such as community supported agriculture projects (subscription farms) would also be useful.

Research is still needed to address questions about the costs and benefits associated with transitioning to a more regional food system. If demand were to increase for local foods, we need information about how local markets and local agriculture might change. In addition, little is known about what consumers consider "local" or what should constitute a "foodshed." More needs to be learned about how consumers' choices are influenced by how they feel about where their food is grown, and its perceived and actual nutritional adequacy.

Wilkins concludes by suggesting that as consumers become more aware of the increasing environmental and social costs associated with the current global food system and the potential benefits of a more decentralized one, food preferences may indeed shift. However, this change in consumer demand will only come about with effective and continuous education through a variety of venues.

For more information contact: Jennifer Wilkins, Division of Nutritional Sciences, Cornell University, Ithaca, NY 14853.

*(GWF.596)*
*Contributed by Gail Feenstra*

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Summer, 1996 (v8n3)

# Production practices and economic performance for organic cotton in the Northern San Joaquin Valley - 1995.

*Karen Klonsky, Laura Tourte and Sean Swezey*

*Proceedings of the Beltwide Cotton Conferences. January 8-12, 1996, Nashville, Tennessee. National Cotton Council of America, Memphis, TN. 1996*

*Article reprinted with permission.*

## Background

This paper is part of a larger study entitled *Production Practices and Sample Costs for Organic Cotton _ Northern San Joaquin Valley- 1995*. The complete study is one of a series of reports from the project *Practices and Performance of California's Organically Grown Crops*. The project was undertaken to document the production practices and associated costs for a variety of organically produced commodities in California. Overall goals include assessment of the economic viability of alternative farming systems, dissemination of information to growers, researchers, policy-makers, and industry, and identification of areas where further research is necessary.

## Introduction

The California cotton production industry ranks second in cotton production in the nation with over one million acres of irrigated cropland. Cotton is the fifth largest contributor to total farm income in the state, and regularly has a gross value of approximately $1 billion in seed and lint.

In recent years California's organic agricultural industry has expanded considerably. The production of organic cotton has likewise increased. Several San Joaquin Valley growers now devote a portion of their acreage to the production of organic cotton, with a substantial number of those acres located in the Northern San Joaquin Valley. Crops rotated with organic cotton include alfalfa, dried beans, leguminous green manure crops (bell beans, peas, and vetch), processing tomatoes, oats, and wheat.

## Materials and Methods

Grower interviews served as the basis of information for *Production*

*Practices and Sample Costs for Organic Cotton- Northern San Joaquin Valley _ 1995*. The report was further developed in cooperation with Extension specialists, farm advisors, researchers, and industry representatives. The larger study consists of two distinct parts: a narrative and an economic analysis. The narrative details the range of approaches possible for organic production of cotton, with sections on production and ginning practices, crop rotation and diversification, cover crops, pest management, grower risk and marketing, and state and federal organic regulation. A summary of the narrative section is included here.

The complete economic analysis is a cost and returns estimate for a hypothetical farm. Enterprise budgets are generated in several formats: costs per acre by operation, costs per acre by input, monthly cash costs, investment, and business overhead, and a profitability ranging analysis. Summary tables for cash costs per acre and net returns per acre above cash costs are presented after the references.

## Results and Discussion

Many of the production practices for organically grown cotton are similar to that of the conventionally grown crop. Production differences are seen primarily in soil fertility and pest management, and in boll maturation and defoliation techniques. Harvest and ginning practices are somewhat modified.

**Soil Fertility.** Organic growers manage soil fertility using a number of different strategies. Composted animal manures are spread and incorporated into soils to provide organic matter, nitrogen, phosphorus, potassium, and other nutrients. Cover or green manure crops have also been successfully managed and rotated on a small scale in the short winter between production seasons. Grasses such as barley and wheat, and legumes such as bell beans, winter peas, and vetch are typically planted. In addition, crop rotation and diversification assist in nutrient cycling and organic matter management. Organic matter is particularly important for improving soil structure, and for providing nitrogen and other nutrients for crop production.

**Pest Management.** Pest identification, monitoring, and prevention are essential elements of successful cotton production. This is especially true for organic production because most of the pesticides that are currently used by producers of conventionally grown cotton are not approved for use by growers of organic cotton. Moreover, allowed pest control products are generally not as effective as synthetic pesticides for immediate or acute problems.

Insect and mite pests are managed by monitoring the level of natural predators, parasites and parasitoids, and by the release of biological control agents to augment those which already exist in the field. Natural predators, parasites and parasitoids found in Northern San Joaquin Valley cotton fields include: assassin bugs (Family Reduviidae), bigeyed bugs (*Geocoris* spp.), minute pirate bugs (*Orius* spp.) and various spiders and parasitic wasps. Green lacewing larvae (*Chrysopa* spp.) are often released to help reduce populations of lygus bugs, mites and other soft-bodied insects such as aphids. Predaceous mites and beneficial wasps of the genus *Trichogramma* have also been released to help reduce populations of various insects and caterpillars.

Other strategies used for arthropod management include: plant neighboring trap crops or habitats to attract beneficial insects, crop rotation and diversification, water management, and the use of organically acceptable pesticides. For example, sulfur dust is sometimes used to control mites in fields or field perimeters.

Weeds are managed primarily with mechanical cultivations, and hand chopping and hoeing. Growers report greater difficulty in managing weeds in organic cotton acreages than in conventional cotton acreages. Furthermore, greater difficulty is encountered in managing perennial weeds over annual weeds. Perennial weeds are sometimes managed by rotating land with known problems out of cotton and into a winter wheat (or other grain) crop. By spring, the grain crop is established and has the potential to suppress germination of perennial weeds by excluding sunlight. Because the overwintered grain crop is not irrigated in the spring, weeds must also compete with the established crop for water. In some cases, fields may be fallowed over the winter and cultivated multiple times in the spring and early summer to reduce perennial weed growth. In contrast, herbicides, mechanical cultivations and hand hoeing are used to control annual and perennial weeds in conventional fields.

**Boll Maturation and Defoliation.** The synthetic growth regulators and defoliants used for conventionally grown cotton are not approved for use in organic cotton production. Growers instead rely on nutrient and water management to assist in boll maturation, opening and plant defoliation. For example, growers supply only enough nitrogen to insure fruit set and boll development on a yearly basis. Overfertilization or excessive soil nitrogen promotes vegetative growth and discourages boll maturation. Zinc sulfate is foliar-applied to assist in boll maturation and opening. A soil or plant deficiency in either zinc or sulfur must be demonstrated before this material can be applied. Also, water is cut off early in the season in an attempt to stress plants and aid in defoliation.

While helpful, these techniques do not always achieve the same results as the synthetically formulated materials. In cases where a low level of defoliation is attained, harvest may be slowed and cotton grades reduced, with trash levels and ginning costs increased.

**Harvest and Ginning.** Organically grown cotton is best harvested with a low moisture content so that, if necessary, cotton can be stored for a period of time prior to ginning without reducing grade or quality. To achieve this, harvest of organic cotton often begins later and is finished earlier in the day than is typical for conventionally grown cotton.

Low moisture content, and the potential for storage is particularly important because state law and certification agency regulations require organic and conventional cotton to remain separated at the gin if the product is to be sold on the organic market. Gins must shut down and clean out their machinery prior to processing organic cotton in order to meet these regulations. Consequently, a gin may not be immediately available to accept and gin the organic seed cotton, resulting in the need for storage. Cotton that is harvested at a relatively high moisture content, and not ginned promptly, may have lower grades due to lint staining caused by leaf trash. In addition, decomposition of seed cotton can occur.

**Yields.** Yields for organically produced cotton in the Northern San Joaquin Valley range from 1.3 to 2.0 (500 pound) bales per acre for cotton lint, and 1,100 to 1,500 pounds per acre for cottonseed. This yield range is somewhat lower than the five year average for conventionally grown cotton in the same area.

**Costs and Returns.** Cash costs are summarized in Table 1. Cultural costs include land preparation, planting, irrigation, and fertility and pest management. Labor, fuel, and repair costs are also included in this category. Ownership costs of durable (tractors, equipment, and irrigation system) are not included. Business overhead includes land rent, office expenses, soil analyses, sanitation services, liability and property insurance, and investment repairs. Assessment fees are paid to both state and certification agencies to comply with organic farming regulations. For various other purposes fees are also paid to the National Cotton Council, Cotton Incorporated, USDA High Volume Instrumentation, California Cotton Growers and Ginners Association and the California Department of Food and Agriculture Pink Bollworm Project.

Returns to organic growers usually range from $1.00 to $1.40 per pound lint which includes an organic premium. However, price premiums are not guaranteed, nor are all bales necessarily sold at one set price. At present the market for organic cotton is volatile, that is, demand and price vary significantly from year to year. If a market for organic cotton lint is unavailable in any given year, lint is sold on the conventional market without receiving a premium. For 1995, the preliminary price is estimated to be $0.815 per pound lint.

Net returns per acre above cash costs are summarized in Table 2. With an estimated price premium of $1.00 per pound for organic cotton lint, net returns are positive at a yield of 850 pounds lint per acre. All yield and price combinations above this level are also positive. However, cost calculations indicate that growers must receive a price premium for the crop to remain economically viable.

**Table 1. Cash Costs Per Acre for Organic Cotton**

| **Cost Category** | **$/Acre** |
|---|---|
| Cultural | 484 |
| Business Overhead | 181 |
| Harvest and Gin | 194 |
| Assessments | 22 |
| Total | 881 |

**Table 2. Net Returns Per Acre Above Cash Costs for Organic Cotton**

| | **Yield (lb/Acre)** | | | | |
|---|---|---|---|---|---|
| **$/lb Lint** | **650** | **850** | **925** | **1050** | **1250** |
| 1.00 | -154 | 12 | 75 | 117 | 139 |
| 1.20 | 9 | 221 | 302 | 356 | 384 |
| | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| 1.40 | 172 | 430 | 528 | 594 | 629 |


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To request a copy of the complete study, or a list of other titles in this series on the practices and performance of organically grown crops in California, contact the Department of Agricultural and Resources Economics, University of California, Davis, CA 95616, Tel. (916) 752-9376.

*(DEC.538) Contributed by Laura Tourte*


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# The fate of lawn care pesticides during composting.

*F.C. Michel Jr., D. Graeber, L.J. Forney and C.A. Reddy*

*Biocycle 37(3):64-66. 1996*

This article presents the results of a study that has relevance to farmers and gardeners wishing to use compost from lawn clippings that may have been treated with pesticides. According to the article, over 30,000 tons of pesticides are used each year on lawns, turf farms, and gardens in the U.S.

In this study, researchers determined the fate of three lawn care pesticides during composting. The pesticides tested were the insecticide diazinon, which is the most widely used lawn care pesticide in the U.S.; 2,4-D, a postemergence broadleaf herbicide which ranks second in use; and pendimethalin (also called Prowl®), a preemergence herbicide commonly used to control broadleaf and grassy weeds. The experiment was conducted using a laboratory scale compost system which simulates the temperature and aeration conditions found in windrows. The sample yard trimmings consisted of leaves and grass in a 2:1 ratio (wet weight basis). This blend was amended with radioactive pesticides at 10 ppm, to simulate the levels of these compounds that might be expected in raw materials used at composting facilities.

Each pesticide was tested for three fates. The most desirable fate for a pesticide during composting is complete mineralization to carbon dioxide (CO2). Another potential fate is volatilization into the atmosphere, which may be accelerated by high composting temperatures. Pesticides could also be leached out during composting and contaminate groundwater.

The results showed that 2,4-D was mineralized relatively rapidly during composting, with nearly half converted to CO2 in 50 days. Also, the rate of mineralization paralleled the rate of conversion of total carbon (in the yard trimmings) to CO2. Diazinon and pendimethalin mineralized much more slowly. Only small fractions of the three pesticides were volatilized, even though the temperature was maintained at 55 to 60 C (131 to 140 F) through much of the composting period. The leachability of each of these pesticides was also low. Finally, only a small portion of the pesticides remained unchanged in the final compost: less than 0.01 ppm for 2,4-D, 0.01 ppm for diazinon, and 0.1 ppm for pendimethalin.

This study also evaluated the quantity of pesticide breakdown products in the compost. Nearly 30 percent of the diazinon originally present in the feedstock was found to be rapidly converted to a substance with low toxicity. On the other hand, very small amounts of breakdown products from pendimethalin and 2,4-D were found.

Researchers also studied the fate of carbon in the three pesticides during composting. The results showed that while most of the carbon was extractable when composting began, about half of the 2,4-D and diazinon carbon and about three-fourths of the pendimethalin carbon was found in humic materials or was unextractable from the final compost. This pesticide carbon was believed to be chemically different from the parent compound and less bioavailable than the original pesticide. It was noted, however, that very little is known about how, and in what form, these "bound" pesticide residues in compost are released over time.

*For more information contact: Michel Graeber, NSF-Center for Microbial Ecology, Michigan State University, East Lansing, Michigan 48825.*

*(CI-PEST.138)*
*Contributed by Chuck Ingels*

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