CASFS
The CENTER for AGROECOLOGY & SUSTAINABLE FOOD SYSTEMS

the Cultivar

The CENTER for AGROECOLOGY & SUSTAINABLE FOOD SYSTEMS

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in this issue:



# Center Marks 40 Years of Innovation in Sustainable Food and Agriculture

Dean of Social Sciences Sheldon Kamieniecki reads from a state resolution honoring the 40th anniversary of the founding of the UCSC Student Garden project and the accomplishments of the Center for Agroecology & Sustainable Food Systems.

"There is a student-run garden on the campus of the University of California at Santa Cruz which puts forth flowers and vegetables in abundance and with a vigor that simply must be seen in person to be fully comprehended. To me this demonstration, this dazzling year-round fertility rite, has long-term implications which, while not entirely clear, may well prove to affect the lives of thousands, perhaps even millions, of Americans as the years go on."

William Bronson, "The Lesson of a Garden"
*Cry California* magazine, 1970–71

Bronson's words proved prophetic: the Student Garden Project that Alan Chadwick and his student apprentices brought to life at UC Santa Cruz starting in 1967—and all that has grown from it—have indeed had a major impact on food and farming systems over the past four decades.

Chadwick and his apprentices not only created a vibrant organic garden—they set a precedent for forty years of groundbreaking work in sustainable food and agriculture education, research, and public service at UCSC. The garden sparked the growth of a 25-acre organic campus farm and an internationally known apprentice training course, as well as cutting edge programs in food systems and organic farming research and extension, national and international work in agroecology, a model farm-to-college program, an award-winning children's garden, and much more.

"We are small but mighty—an incubator for innovation," says Sheldon Kamieniecki, dean of the Division of Social Sciences at UCSC. "Our influence proves you don't have to be a big ag school to have major impacts on farming and food distribution."

In this article we'll take a brief look back at the Farm & Garden's history and examine some of the innovative ways that the Center for Agroecology & Sustainable Food Systems continues to stay at the cutting edge of sustainable food and agriculture research, education, and public service.

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## ROOTS OF THE GARDEN AND FARM

Beginning in 1967, long before sustainability became part of the vernacular, students at UC Santa Cruz were practicing organic gardening under Chadwick's exacting direction. Chadwick had been brought aboard at the fledgling campus to start a garden project that would help give students a "sense of place" amidst the chaos of construction at the newest of the University of California campuses.

Chadwick's students formed the core of an informal student "apprenticeship," working alongside him to transform a chaparral-covered slope in what was then the heart of the growing campus into a lush, vibrant organic garden. This apprenticeship approach to teaching—in which instructors worked side-by-side with the students, gradually giving them increased responsibility—would become a hallmark of the training approach used at UC Santa Cruz.

Inspired by the garden's success, students lobbied for a larger plot of ground on which to put Chadwick's organic practices to work. In 1971, seventeen acres on the lower campus were set aside for an organic campus farm. Later expanded to twenty-five acres, the UCSC Farm became a demonstration and teaching site for small- and medium-scale organic farming techniques. Faculty and student involvement in the garden and farm grew in the 1970s with courses in organic horticulture and agriculture offered as "practicums" through the Environmental Studies Department, as well as appropriate technology and natural history classes based at the farm. Students took advantage of opportunities provided by the farm and garden to design thesis projects and learn through independent studies. Students and staff planted orchards, windbreaks, and perennial borders, creating a diversified organic farm on the growing campus.

Courtesy of Steve Kaffka

**Organic gardening class offered by farm manager Steve Kaffka (top left) and Pierre Ott (in red sweater) at the UCSC Farm, 1973.**

In 1975, the loosely organized apprenticeship that began under Chadwick's direction was formalized into a full-time, year-round program offered through UC Santa Cruz Extension. The Apprenticeship Program was the first university-based program to offer students intensive academic and experiential training in organic gardening and farming techniques.

With a dedicated work force, the original Garden Project expanded and the farm grew to include tractor-cultivated row crops, as well as hand-worked garden beds, generating enough produce to support a small direct marketing and wholesale effort, and establishing one of California's first organic "farmers' markets."

## ESTABLISHING A PROGRAM IN AGROECOLOGY

The late 1970s saw increasing concern over the environmental and social effects of conventional farming, from pesticide pollution and soil erosion to the impoverished status of farm workers. The Environmental Studies faculty recognized that the UCSC Farm & Garden projects held potential for wider academic and research applications that could address such issues.

To help develop that potential, Steve Gliessman was hired in 1980 to create the Agroecology Program—this was the first University of California program to focus specifically on what would come to be called "sustainable" agriculture.

Recognizing that sustainability required social as well as environmental changes, the Agroecology Program hired social scientist (and current CASFS director) Patricia Allen in 1984. Allen initiated the nation's first work on social issues in sustainable agriculture, addressing topics such as labor, gender, and access to food. Allen also organized and spearheaded the first University of California systemwide conference on agricultural sustainability in 1985.

In addition to its work with academic groups, the Agroecology Program also created ties with local, small-scale growers. In 1989 the program hired entomologist Sean Swezey and began a Farm Extension effort to serve growers interested in organic farming techniques. This was the first public organic extension service offered in the U.S.

Program researchers worked with local growers on their farms on studies examining the transition from conventional to organic management in crops such as strawberries, apples, artichokes, and cotton. This work took a unique "whole systems" approach that included research on soil fertility, pest control, and economic impacts.

In 1994 the Agroecology Program was renamed the Center for Agroecology & Sustainable Food Systems, to better reflect its blend of natural and social sciences work. In 1997, agroecologist Carol Shennan was hired as the center's director. Shennan brought an interest in agroecosystems and landscape ecology and developed a focus on intersections among agroecology, environment, and community. In 2007 Patricia Allen was appointed director, and continues her work to address various social issues in sustainable agriculture (see next page).

## MOVING INTO THE FUTURE

Over the past decade the growing interest in organic food and alternative food initiatives, such as farmers' markets, community supported agriculture (CSA), farm-to-college programs, and school gardens has heightened the need for research and education in these areas. Student demand has also triggered interest in farm-based college programs nationwide.

Building on its history of innovations, CASFS has expanded its work to respond to these needs. Center members provide training materials and expertise to college programs around the country; conduct research to analyze and improve organic farming practices and minimize farming's impact on natural resources; and analyze the latest trends in consumer interests, food equity issues, and alternative food systems. The growing Farm-to-College effort at UCSC is creating new ways for CASFS to work with students, staff, and faculty to develop a food system that is environmentally sound and socially just.

Some of the highlights of work now taking place at CASFS include:

• Trend-setting research and scholarship on social issues in the agrifood system, with current fields of study including perceptions of and priorities for social justice in the agrifood system, farm-to-institution programs, food-system localization efforts, gender issues in agrifood systems, priorities and pedagogies in sustainable agriculture education, and consumer interests and preferences.

• Basic and applied natural science research on ways to conserve nutrients on organic farms, minimize the impacts of farming on surrounding ecosystems, and manage pests and diseases with organically acceptable techniques, including an innovative approach to minimizing pest damage in strawberries (see page 17).

• The Apprenticeship in Ecological Horticulture, which has helped revitalize small-scale farming by providing hands-on training in organic production to more than 1,200 people, including students from Africa, Asia, and across the United States. In addition, UCSC offers the only formal training in community-supported agriculture programs (CSAs). In January, the apprenticeship received a coveted Steward of Sustainable Agriculture Award from the Ecological Farming Association (see page 19).

CASFS Photo Collection

**CASFS researchers (from left) Janet Bryer, Diego Nieto, and Sean Swezey at a field site where they test pest management alternatives.**

Doron Comerchero

**High school students in a new youth empowerment program based at the UCSC Farm, with flowers from their farm plot; these were donated to a Santa Cruz family shelter.**

• The Life Lab Science Program based at the UCSC Farm, which has developed a garden-based science curriculum and worked with more than 1,400 schools across the United States; and a new youth empowerment program located at the UCSC Farm that partners with teenage youth to grow, cook, eat, and distribute healthy, sustainably raised food.

• The UCSC Food Systems Working Group, a leader of the national farm-to-institution movement that is lobbying schools, colleges, hospitals, and other institutions to buy fresh food from local farmers (see page 9). UCSC Dining Services is at the forefront of environmentally friendly practices within the UC system and beyond, serving a high percentage of local and organic produce in campus dining halls, recycling used cooking oil, and switching from a national to a local food distribution company to support the local economy and reduce fossil-fuel consumption.

• Far-reaching impact on higher education: UC Davis, for example, has incorporated sustainability into its College of Agricultural and Environmental Sciences, while training manuals and advice from CASFS staff have helped establish campus-based farm education programs across the country, including at Washington State University, Colorado State University, the University of Georgia, the University of Montana, and Michigan State University. This year, CASFS members helped found the National Sustainable Agriculture Education Association to boost the number and quality of such college and university programs (see page 15).

"Today, the hillside where it all began beckons visitors to the Alan Chadwick Garden, and the spirit of innovation that first took root there has infused all that has come since," says Allen. Throughout this issue of *The Cultivar*, you'll find more on how CASFS is continuing its innovative work.

– Martha Brown, Jennifer McNulty, and Patricia Allen

from the
# editor

Welcome to this special double issue of *The Cultivar.* Our fortieth anniversary event held this summer sidetracked our spring/summer newsletter, so we've rolled two into one to bring you updates on activities taking place at the Center for Agroecology & Sustainable Food Systems (CASFS or the Center).

This issue of *The Cultivar* reflects the range of innovative work that has evolved at the Center over the past four decades. Our cover article traces the evolution of CASFS from its start as the Student Garden Project to its current leadership role in sustainable agriculture and food systems research, education, and public service.

One recent area of focus has been the emerging farm-to-institution movement. Besides working to expand the farm-to-college effort on a state and national scale (*page 9*), we are also part of a major social sciences research project evaluating how farm-to-institution programs can better serve the needs of consumers, small- and medium-scale growers, and institutional buyers (*page 7*).

Our efforts aimed at improving organic farming techniques continue to evolve, as we build on methods developed by Center researchers to control pests and diseases in organic strawberry and vegetable crops. Two USDA grants are supporting an expansion of this work in organic systems and an extension of the research to conventional settings, with the goal of cutting pesticide use and finding a viable alternative to methyl bromide (*Research Updates, page 17*).

Center members and UCSC students have been integral to a new effort to improve sustainable agriculture education nationwide. The recent founding of the Sustainable Agriculture Education Association and the second national meeting on this topic have recently expanded this work (*page 15*).

In collaboration with Cooperative Extension colleagues, the Center also continues to serve small- and medium-scale organic growers through its efforts to identify profitable crop options. This year our organic blueberry trial bore abundant fruit, giving researchers a preliminary look at which varieties might offer local growers a potentially profitable niche crop (page 5).

Finally, the article on French intensive gardening (*page 21*) brings us full circle to the program's roots—teaching a soil stewardship ethic that builds soil health, conserves resources, and produces an abundance of carefully managed crops.

May the coming season be one of abundance for all.

– Martha Brown, Senior Editor




the Cultivar

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The Center for Agroecology & Sustainable Food Systems is located at the University of California, Santa Cruz. Our mission is to increase environmental and social justic in the food and agricultural system. On the UCSC campus, CASFS manages the 3-acre Alan Chadwick Garden and 25-acre UCSC Farm. Both sites are open to the public daily from 8 am – 6 pm year round.

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# Blueberry Variety Trial at UCSC Farm Bears Promising Fruit

The experimental planting of 15 blueberry varieties at the UCSC Farm came back strong after last winter's freeze, bearing plenty of fruit in late spring and early summer for taste tests, the Farm and Garden's roadside stand, and Community Supported Agriculture (CSA) shareholders.

Blueberries are a potentially lucrative crop for small-scale organic growers—a successful organic crop can generate $30,000–$50,000 gross, per acre, in direct and retail sales. UCSC Farm manager Jim Leap, along with UC Cooperative Extension farm advisors Aziz Baameur and Mark Bolda, established the variety trial of 180 plants at the UCSC Farm in January 2004 to find out what varieties would perform best under Central Coast growing conditions. This was the second year that the blueberries had borne fruit; Farm staff stripped flowers the first two cropping seasons to encourage plant establishment.

After this year's harvest, Leap is unequivocal in his enthusiasm for Southmoon, one of 13 southern high-bush varieties being trialed along with 2 northern high-bush varieties. Says Leap, "If you want the grower's perspective I would have to say, hands down, that for our specific location Southmoon is absolutely number one at this early stage of the trial. Our 'on farm,' informal flavor tests conducted this year very clearly placed Southmoon significantly above the other varieties."

Although not the heaviest yielding of the plants in the study (see figure 1), Leap points out Southmoon's superiority in other important factors that are sometimes difficult to quantify: ease of harvest, ease of pruning/shaping, and adaptation to climate. "Some of the other varieties are very challenging to harvest due to things like dense foliage [Emerald], a tendency to 'cling' to the plant [Bluecrop, Jubilee] and uneven ripening [Oneal]," says Leap.

Field production manager Julie Stultz prunes a blueberry plant in the organic variety trial at the UCSC Farm.

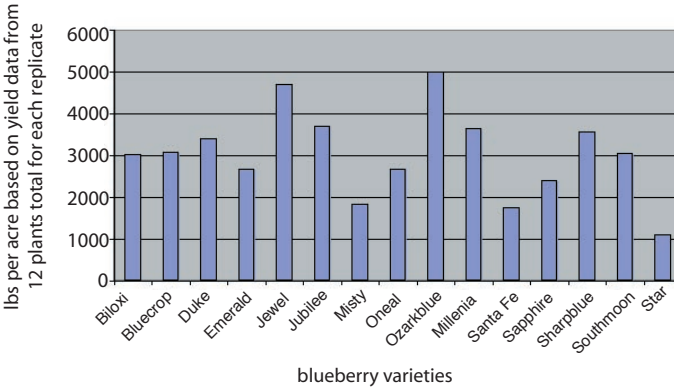



Figure 1. Total 2007 yield from all replicates in the organic blueberry variety trial, UCSC Farm. Data reflect all replicates (3 plants/replicate x 4 replicates/variety). Plants are on 3 x 9 foot spacing = 1613 plants/acre.

A more formal evaluation by a tasting panel ranked the variety Sharpblue at the top based on both physical (weight, size) and sensory (taste, appearance) attributes, followed by Jewel , Southmoon, Ozarkblue, and Santa Fe. Baameur notes that all of these data are preliminary and it will take at least another year or two before the research team is ready to make formal recommendations.

### CLIMATE, SOIL ACIDITY PRESENT CHALLENGES

Many of the varieties aren't adjusting to the UCSC Farm's marine-influenced climate. "Right now [October 18th] many varieties are extremely confused about what season they're in," says Leap, noting that there are lots of fruiting buds being initiated on some varieties (Bluecrop, Duke, Emerald, Misty, Ozarkblue), others have both fruiting buds and blooms (Santa Fe, Sharpblue, Star), and some varieties have fruiting buds, blooms and fruit (Biloxi, Jubilee, Oneal, Sapphire). "Only three varieties are actually heading gracefully into dormancy right now. Those are Jewel, Millennia

> *continues on next page*

and Southmoon," says Leap, though he notes that this trend could potentially vary from year to year based on different chill hours and other factors.

The research group has also found that the higher chill requirements (1,000 hours) for the northern high-bush varieties (Duke and Bluecrop) render them impractical for the Central Coast's climate. "Interestingly these two varieties are the only two that give the appearance of complete dormancy during the winter," says Leap. However, the researchers found that the northern varieties tend to set fruit prior to leaf set and the fruit is almost completely tasteless.

Thankfully, that wasn't the case with most of the varieties: the fresh berries were a hit with CSA members and shoppers at the Farm & Garden's twice-weekly roadside stand. "They were impressed with the amazing flavor of fresh blueberries," says Leap, who explains that commercially available berries in this area typically come from Chile and Argentina during the winter months and from Oregon and the Central Valley during the early summer months. "That means that the freshly harvested fruit has a distinct advantage in the market," says Leap.

Although the blueberries that perform well have proved both popular and profitable, the cost of establishing, maintaining, and protecting the plantings may be a deterrent. Getting the soil's acidity to a level high enough for blueberries to thrive—and keeping it there—is a challenge in a setting such as the UCSC Farm, with its relatively low-acid soil. In a recent *California Agriculture* article (Oct–Dec 2007), Leap noted that inexpensive sulfuric acid can be applied to conventionally managed blueberry fields, but he has had to buy vinegar approved by the Organic Materials Review Institute (OMRI) for use in certified organic systems (see table 1 for production costs).

"We've been injecting vinegar with each irrigation. Before we planted, we applied a lot of soil sulfur and acidic soil amendments, but we still need the vinegar, and buying it in 55-gallon containers and trucking them in here might turn out to be prohibitively expensive," he says. This year Leap also had to put up bird netting to protect the fruit.

Despite these drawbacks, Central Coast growers have shown considerable interest in adding blueberries to their cropping systems. Although they're unlikely to displace the Central Coast's profitable strawberry and raspberry crops, blueberries could find a profitable niche in smaller, more diversified Central Coast operations for marketing through CSA projects and farmers' markets. "This would be especially applicable if a site's soil was naturally acidic to begin with," says Leap, who notes that given the short (6-week) production window, blueberries would need to be a small part of a much more diverse cropping system. "I'd recommend blueberries to small-scale organic producers as long as they fully understand the risks, the costs and the challenges."

–Martha Brown

Table 1: Initial fixed and annual costs associated with blueberry variety trial at the UCSC Farm.

| **Initial fixed costs*** | **.16 acres** | **per acre** | **Notes** |
|---|---|---|---|
| Plants (200@4.25) | $850 | $5,312.50 | 1 gallon grow bag/current price |
| Stakes for bird netting (24@$7.40) | $177.60 | $1,110.00 | 10 foot "T" posts |
| Bird netting | $502 | $3,137.50 | |
| Wire for bird netting (1,500 feet | $240 | $1,500.00 | 1/16 coated wire |
| T post "toppers" (24) | $24 | $150.00 | |
| Sulfur (400 lbs@.30/lb) | $120 | | |
| Mulch (48 yards @ $10/yard) | $480 | $3,000.00 | |
| 1/2" poly drip lines (2,000 feet) | $239.00 | $1,493.75 | pressure compensating .4 gal/100 ft |
| Irrigation header | $100 | $625 | does not include fertilizer injector |
| **Total** | **$2,733** | **$17,078.75** | |

*fixed costs associated with larger plantings will decrease due to economies of scale

| **Annual costs**** | **.16 acres** | **per acre** | **notes** |
|---|---|---|---|
| Irrigation water (31,950 gallons 3rd year) | $83.07 | $519.19 | current rate = $0.0026 ($ per gal) |
| Vinegar (50.5 gallons 3rd year) | $275 | $1,718.75 | does not include transportation costs |
| Mulch ($10/yard) | $150 | $937.50 | |
| Phytamin (10 gallons 3rd year) | $71.80 | $448.75 | |
| **Total** | **$579.87** | **$3,624.19** | |

** annual costs such as water, vinegar and liquid fertilizers will go up as plant size increases until about year 5

# First Year of Farm-to-Institution Study Offers Insights into Potential, Challenges

Schools and universities, hospitals, prisons, and other institutions offer growers a nearly unlimited market for fresh produce and other products. But what's the best way to access those markets if you're a grower? If you're a buyer or chef, how do you develop a purchasing program for local, sustainably grown produce in a way that makes sense for your institution? And how much demand is there for organic food and other sustainable products amongst consumers, such as college students?

Those are the types of questions CASFS social issues researchers Patricia Allen and Jan Perez, and project coordinator Gwendolyn Keith are helping address in a two-year study funded by a $400,000 grant from the USDA's National Research Initiative of the Cooperative State Research, Education and Extension Service (CSREES). Initiated in fall 2006, this collaborative project includes researchers from the UC Sustainable Agriculture Research and Education Program (UC SAREP) and members of the Community Alliance with Family Farmers (CAFF); along with Allen, Extension Economist Shermain Hardesty of Agricultural and Resource Economics at UC Davis co-directs the study. (See Volume 24 #2 of *The Cultivar* for additional project details.)

### SURVEY REVEALS SUPPORT FOR SUSTAINABLE PRACTICES

Perez is particularly interested in the demand among college students for food from small and medium-sized farms with sustainability criteria (for example, organic, locally grown, and socially just). "Gathering this information helps us to know what kind of support is available for moving these initiatives along, and how to prioritize the criteria," she says.

In a nationwide written survey of college students conducted this year, Perez found a definite interest in organic produce: of the 224 returned surveys from students nationally, 47% said they wanted their college to provide organic food. A small majority of students (53%) wanted their college to provide food that is locally grown; fewer (40%) were interested in food produced by a small farm. But the highest interest among students was for food that is humanely produced (78%), provides a living wage to workers (71%), and is sustainably produced (62%).

In considering these results, Perez notes that, "Student priorities are interesting here, in that 'organic,' 'local' and 'small farm'—qualities often promoted by farm-to-institution advocates—are rated somewhat lower on the list of priorities. However, there is still support available for all of these concepts."

Survey results also made clear that there's a lot of education to be done when it comes to using terms such as "organic" and "sustainable" in outreach efforts to promote sustainable food systems. Says Perez, "Many people don't realize that these terms actually encompass the environmental and social qualities that they support. I think we need to get specific about those qualities—such as resource protection, support for local economies, and social equity—that are embodied in 'organic,' 'small farm,' and other criteria, and not just assume people know what these terms represent."

### BUYERS WILLING TO PAY PREMIUMS, OFTEN PREFER SOURCING FROM SINGLE VENDOR

While consumers may be interested in supporting sustainable food systems, it's the food service buyers who have to translate that interest into action. Hardesty, who is surveying food-service buyers at California colleges and hospitals, found that 28% of the 98 buyers she has interviewed already have a local buying program and 21% are developing one.

Hardesty also found that buyers were willing to pay the highest premium (26%) for organic produce, but only 18% more for produce grown on a small- or mid-scale farm. Premiums for food with the criteria of sustainably grown, local, and grown on a farm paying living wage for farmworkers all averaged 24%. However, between one-fourth and one-third of the respondents indicated that they would not pay any premium for produce with these criteria.

Aliza Wasserman

**Hmong growers from the Central Valley display their produce at a conference sponsored by the Community Alliance with Family Farmers as part of the farm-to-institution project.**

Based on Hardesty's findings, it will take a major shift in current purchasing practices for more individual growers and grower collaboratives to break into the institutional market. Her results indicate that by far the majority of buyers (94%) purchase from produce distributors; 10% also purchase from individual growers, 9% from grower collaboratives, 7% from farmers' markets, 7% from various retailers, and 6% from campus farms. Says Hardesty, "Of the buyers interviewed, 45% are currently purchasing from one vendor and many prefer to keep this single supplier structure to simplify their ordering and delivery logistics."

Gail Feenstra, Jeri Ohmart, and Tracy Perkins of the UC Sustainable Agriculture Research and Education Program (SAREP) are interviewing farmers and distributors in order to better understand the challenges and opportunities offered by selling to institutional buyers (such as the ones that Hardesty is interviewing). They developed a typology of five distribution models by which local produce gets to institutional buyers: Direct farmer to institution model; Grower/shipper/packer distribution; Non-profit allied distributor; Regional distributor; and Broadline distributor. They created three interview protocols for: institutional food service buyers, distributors, and farmers. The research team completed almost 95 interviews and a survey on transaction costs was given to interviewees. These data are now being analyzed.

**STUDY INCLUDES OUTREACH TO STAKEHOLDERS**

Building a data set is important, but equally critical is giving stakeholders the opportunity to share ideas with each other. As part of the study's outreach component, Anya Fernald, Aliza Wasserman, and other members of the Community Alliance with Family Farmers (CAFF) organized a Farm to Institution Connection event, held July 25th in Oakland, which brought ninety participants together to discuss barriers and solutions for institutions to source food from local small growers. Also taking part were a dozen small farmers from the Sacramento and San Joaquin Valleys, who displayed their produce and provided samples and cooking ideas.

A panel presentation by Michael Dimock, Executive Director of Roots of Change, Lisa McEuean, Regional V.P. of Bon Appetit Management Company, and Elizabeth Baily of Kaiser Permanente Food and Nutrition Services, addressed problems with conventional sourcing and solutions employed in leading local food programs, such as Bon Appetit's *Farm to Fork* vendor program and *Low Carbon Diet*, which stress seasonal produce purchased from within a 150-mile radius of each café.

Participants also took part in small group discussions about the challenges, solutions, and resources needed to help build market connections between family farmers and institutional buyers, covering topics such as packaging expectations, ripeness level when picking, administrative support, cost of processing, and local food distribution options.

Aliza Wasserman

**Participants in a round-table discussion at the Farm to Institution Connection event held this summer in Oakland.**

Institutional buyers at the event included representatives from Fresh & Natural Inc., UCSC Dining Services, Cal Dining at UC Berkeley, Sodexho at UC Davis, UCSF Medical Center, Oakland Unified School District and ARAMARK. As Wasserman noted in an article in CAFF's newsletter, *Agrarian Advocate* (Fall 2007), "Many institutional buyers were delighted to learn about existing distributors that deliver local food—such as ALBA Organics and CAFF's own Growers Collaborative."

Evaluations of the event revealed that networking is important to this group of people and that they want to hear examples of how farm-to-institution is working for others. According to the research team, this feedback will shape future activities, to ensure that research dissemination also includes opportunities for stories to be shared and provides chances for networking.

Such flexibility is a hallmark of this project, which integrates not only researchers from different disciplines and university campuses, but includes an advisory team representing key stakeholder groups to make sure the research is relevant to the actual situations that stakeholders encounter. The involvement of the Community Alliance with Family Farmers also ensures that the information generated by the researchers gets out to the relevant community, farmer, and business groups.

In reflecting on the farm-to-institution project's work to date, Allen is impressed with this degree of integration amongst its various components. "What's unique about the project is combining research, education and extension simultaneously."

The interest that the interviews, surveys, and networking events have generated in the community is positive and growing. There is clearly a demand for information on how to facilitate successful farm to institution relationships, and the research team is already looking at expanding the project to a broader group of stakeholders and addressing the specific issues that are being discovered in the process.

– Martha Brown, Gwendolyn Keith

# Center's Farm-to-College Program Influences Local, State, National Agendas

Efforts to bring sustainably produced food to college campuses are taking off around the nation, with California leading the way—thanks in large part to work taking place at UC Santa Cruz through the campus's Food Systems Working Group (FSWG: see more in *The Cultivar* 24 #1, Spring/Summer 2006).

Tim Galarneau and Nancy Vail, who coordinate farm-to-college efforts for the Center for Agroecology & Sustainable Food Systems (CASFS), are key players in a variety of activities designed to increase the sustainability of campus food systems while creating educational opportunities for students. This article offers a brief review of some recent farm-to-college projects at UCSC and beyond.

Nancy Vail

**Students in the Harvest for Health program pick crops during a visit to the campus's 25-acre organic farm.**

### BRINGING UCSC STUDENTS TO THE FARM

The goals seem modest enough: give freshmen a chance to spend time on a farm. Let them get their hands dirty as they dig carrots, turn compost, and plant seeds. Give them a chance to enjoy the organic produce they harvested at their dining hall that night. Ask them who grew the wheat for their morning cereal, and how far it traveled to get to their breakfast plate.

That's the point of the Harvest for Health Program—simple steps that can get freshmen to start thinking about their connections with the food system. And while basic, such actions can have a profound influence on students who may have given little thought to where their food comes from or the impact of their eating choices.

"You can see and feel in them the disconnect they've experienced when it comes to food," says Vail, who coordinates the CASFS effort to bring freshman students to the UCSC Farm. "It's a huge gap that we attempt to narrow by showing them where some of their food is grown."

This year nearly 200 students participated in Harvest for Health as part of the Sustainability Service program, a project of College Eight's "core course" for freshmen. Three times a week, CASFS staff members and senior Environmental Studies student David Evershed welcomed a new group of students to the UCSC Farm, where they discussed food system initiatives at UCSC as well as sustainable agriculture at the Farm and beyond. During their visit, students also harvested organic produce that was prepared that evening in their dining hall. The program is supported in part by grants from the Wallace Genetic Foundation and the True North Foundation,

The experience leaves an impression; says Vail, "The students understand more about the importance of buying organic, and how great it is to taste something they just picked. Every single one of the Harvest for Health students wants to come back and participate in some way at the Farm." In the spring, these freshmen and others can take a two-credit course, Introduction to Organic Farming, that brings students to the UCSC Farm each week for an in-depth look at agroecology and farming.

For the second year CASFS also offered students shares in its Community Supported Agriculture (CSA) program, entitling them to a weekly box of fresh organic produce grown at the Farm. Says Vail, "Thanks to the budding relationship between UCSC Dining Services and the UCSC Farm, students were able to pay for their CSA shares with their meal plan flexi-dollars."

Each meal plan holder receives $50 in flexi-dollars to spend per quarter, and can combine flexi-dollars with their apartment-mates to cover the cost of a share, or pay with a check. "The fall shares filled up quickly and we had a waiting list of 20–30 more students wanting to join in the future," says Vail.

### BRINGING LOCAL, ORGANIC FOOD TO UCSC DINING HALLS

Seven farms, including the UCSC Farm, make up the Monterey Bay Organic Farmers Consortium (MBOFC) and supply the UCSC campus with locally grown organic pro-

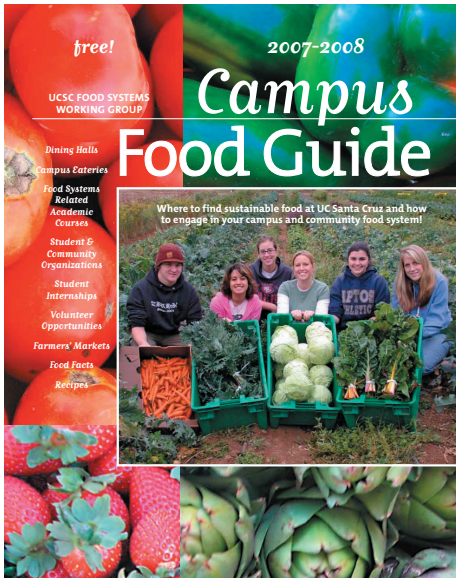
> *continues on next page*

duce. Last year, the consortium provided 24% of the produce used in campus dining halls. "This year, we hope to increase that to 30% through building greater relationships between meal plan holders, chefs, and the MBOFC growers," says Galarneau, who also coordinates farm-to-college education and policy efforts through CASFS and the campus's Food Systems Working Group (FSWG).

As one of the next steps toward increasing the variety of sustainable products offered on campus, FSWG is assessing the feasibility of establishing a regional dairy contract. The goal is to build a relationship with a dairy vendor that would provide hormone-free and organic dairy options. Building upon dairy as well as other humane and local sourcing opportunities, FSWG is also working with UCSC food service managers on ways to further incorporate education into the eating experience. Candy Berlin, Special Projects Coordinator for UCSC Dining Services, and her team have created in-house educational displays, posters, table tents, and other materials to engage diners in thinking about the hidden connections and relationships embedded in the food they eat.

In addition to sourcing local products, UCSC Dining Services is examining its use of products that contain genetically modified organisms (GMOs). Following the July conference of the National Association of College and University Food Services, where Jeffrey Smith, author of *Seeds of Deception* spoke, UCSC Dining Services began exploring steps to go "GMO free" in the campus dining halls. Says Galarneau, "Dining Services is taking the lead on this, looking at 'back of the house' products such as cooking oil and other items that could be replaced with GMO-free products. They are looking into how they can thoughtfully shift their purchasing and educate their staff." In January 2008, Smith will visit UCSC to discuss a GMO-free plan and help develop a model that can be used at other institutions.

This year, in an effort to reduce its overall "carbon footprint," UCSC's Physical Plant undertook a campus-wide Sustainability Assessment. As part of that effort, Dining Services and FSWG crafted a comprehensive food systems section of the survey. "UCSC's campus-wide sustainability assessment, due to be completed at the end of 2007, offers a model for other campuses that want to achieve green goals in the context of the broader campus sustainability movement. We've developed an excellent model for the food component of an assessment, which can be used by other campuses to evaluate their food system," says Galarneau.




**The *Campus Food Guide* offers a wealth of information on food-related topics, including sources of sustainable food on campus, updates on food systems issues at UCSC, and a list of courses, internships, and volunteer opportunities related to food systems.**

### EXPANDING STATEWIDE AND NATIONAL EFFORTS

In mid October, Galarneau met with student representatives from California's UC campuses, state colleges, and community colleges as part of the California Student Sustainability Coalition (CSSC) annual convergence, which took place at UC Berkeley. This statewide effort focuses on reducing climate impacts of campus operations through sustainable building, transportation, and food programs.

Says Galarneu, "This was an opportunity to share 'best practices' with students throughout the state's college systems, and helped us lay a foundation for our upcoming national partnership project, the Real Food Challenge."

This new national campaign is being planned to unite students and campus stakeholders in an effort to create sustainable food systems by drafting common goals and a common framework for bringing "real food" to college campuses. Galarneau is one of 15 design team members working to develop the campaign.

"We're defining 'real food' as food that is ethically produced, with fair treatment of workers, equitable relationships with farmers, and humanely treated animals. It's food that is environmentally sustainable—grown without intensive chemical pesticides, large-scale mono-cropping, or huge carbon footprints," says Galarneau. California will be one of three regional hubs for the Real Food effort, slated for "rollout" in fall of 2008.

In early November, Real Food Challenge members hosted a New England Summit to begin to build the Challenge's Northeast network. According to Galarneau, California and the CSSC will host a similar West Coast Summit in the spring of 2008 with the goal of uniting students from across the post-secondary education spectrum leading into the statewide Sustainability Conference slated for Cal Poly San Luis Obispo in June of 2008.

During his recent East coast swing, Galarneau also spoke at a national conference at the University of Maryland that brought together over 3,400 youth leaders working on climate change to link climate and food systems (http://powershift07.org/). Author and activist Anna Lappé facilitated the panel, entitled: "Take a Bite Out of Climate Change: Your Plate, the Planet, and the Climate Crisis."

By addressing this challenge at many levels—from freshmen harvesting their first carrots to national policy changes—CASFS will continue to play a key role in efforts to improve the sustainability of campus food systems.

–Martha Brown

# "Back 40" Gathering Draws Hundreds of Celebrants to UC Santa Cruz to Mark 40th Anniversary

This summer's "Back 40: Breaking New Ground" event brought hundreds of people to UCSC July 27–29 to celebrate the fortieth anniversary of the Garden Project's founding and the campus's pioneering role in organic farming and sustainable agriculture.

The celebration kicked off with a garden reception at University House on Friday afternoon, followed by a gathering in the Chadwick Garden Saturday morning, a symposium on CASFS and apprentice graduates' work, and a Farm dinner under a nearly full moon on Saturday. Sunday featured networking sessions and a tour of local farms started by Apprenticeship graduates.

More than 500 people attended the weekend's events, including many graduates of the Apprenticeship in Ecological Horticulture, the roots of which were planted 40 years ago on a slope below Merrill College. The creation in 1967 of what is now the Alan Chadwick Garden opened the door to today's array of sustainable agriculture-related research, educational, and public service activities offered by UCSC (see cover story).

In comments during Friday's reception, Chancellor George Blumenthal acknowledged how widely organic farming has been embraced since those early days. "When Safeway and Wal-Mart get involved, you know something's up," he said.

The anniversary showcased the accomplishments of some of the 1,200 graduates of the apprenticeship training program, as well as the work of the UCSC Center for Agroecology and Sustainable Food Systems (CASFS). During the Friday reception, Social Sciences Dean Sheldon Kamieniecki read from a proclamation authored by state Assemblyman John Laird and approved by the California Assembly that heralded the campus's leadership in sustainable agriculture. He also introduced Patricia Allen, the new director of CASFS, who acknowledged the role of environmental studies professor Carol Shennan in advancing the development of the Center during her 10 years as director.

Also at the reception, Chadwick Garden Manager Orin Martin shared a moving personal history of the garden, acknowledging the key roles played by many former UCSC faculty, staff, students, and members of the Friends of the Farm & Garden, including Dean McHenry, Page Smith, Donald Nichols, Hal Hyde, Phyllis Norris, Louise Cain, Paul Lee, Steve Kaffka, and Jim Nelson. The weekend also marked Martin's 30th year with the garden, and he received an enthusiastic ovation from the crowd, which included families with young children, former and current apprentices, staff and faculty affiliates of CASFS, campus officials, and members of the Friends of the UCSC Farm & Garden.

Tosh Tanaka

**Speaking at the Back 40 reception, Chadwick Garden manager Orin Martin acknowledges some of the key figures in the Farm & Garden projects' history.**

The reception also kicked off a major fundraising effort for apprenticeship housing. Spearheaded by apprenticeship graduate and Friends' member Olivia Boyce-Abel, the effort has already raised more than $80,000, thanks in large part to donations from Boyce-Abel and apprenticeship graduate Meg Cadoux Hirshberg. (See page 25 for more on the apprentice housing project.)

Saturday morning brought together more than 200 participants on the slopes of the Chadwick garden where it all began forty years ago. Kurt Christiansen and Michael Hannon opened the morning with poems, Forrest Cook recounted the chain of events that brought Chadwick to UCSC, and Beth Benjamin shared memories of her work with Chadwick during the early years of the Garden Project. Current apprentice Joy Moore shared insights into what it's like to be an apprentice today, and spoke of the work she and her classmates hope to accomplish. Christof Bernau offered a remembrance of longtime friend, artist, and mentor Graydon Livingston, and some of the many others who helped found and support the garden through the years. Orin closed the gathering with his thoughts on the Garden and its role today.

Following the stories in the Garden, Saturday's Breaking New Ground symposium convened across the street at the new Humanities Lecture Hall. CASFS members Patricia Allen, Martha Brown, Sean Swezey, Tim Galarneau, Jim Leap and Diane Nichols gave a dynamic, photo-filled presentation on the trend-setting history of the Farm & Garden, describ-

> *continues on next page*

ing how the projects had evolved into the Agroecology Program, and now the Center for Agroecology and Sustainable Food Systems, and the many ways that CASFS continues to stay on the cutting edge of sustainable agriculture and food systems research, education, and public service.

Graduates of the Apprenticeship then took center stage to discuss some of the myriad ways they've put their training to work. Ann Lindsey, CASFS grant writer, introduced the session, explaining, "We called the symposium 'Breaking New Ground' and decided we wanted to focus on innovative programs and farms; we wanted to hear from people who were combining organic growing with education, with job training, with new markets, with community food projects—bringing urban youth to rural farms, bringing fresh organic produce to inner-city low-income neighborhoods, teaching community gardeners to really grow their own food, training new organic farmers."

Speaking on the theme of *Farms as Agents of Social Change*, Cathrine Sneed, Shawn Harrison, Ursula Chanse, Edwin Marty, Jered Lawson, and Nancy Vail described the way that the farming and gardening programs they've created in California, New York, and Alabama have affected the lives of inner city at-risk youth, prisoners, urban gardeners, the elderly, and so many others. In introducing the speakers, Lindsey noted that "Over the decades, many apprentices have come to the Center with an intense desire to learn organic farming and gardening coupled with a desire to better communities, the environment, the food system, and the lives of those in need through their work." The presenters drew both tears and cheers as they related the powerful results of connecting people to plants, nutritious food, and the land.

Courtesy of Soil Borne Farm

*". . . the Back 40 Celebration really cemented the reality in my mind that the U.C. Santa Cruz program has had a direct role in the training and empowering of today's and tomorrow's sustainable food systems leaders. Speaking from my own experience, the apprenticeship provided me with an experiential education in organic agriculture practices that has proven instrumental in helping us to positively impact our community through our urban farm and education center."*

Shawn Harrison, Co-Founder/Executive Director, Soil Borne Farm Urban Agriculture Project, Sacramento, California (pictured here teaching a gardening seminar)

Courtesy of friendsofbrookpark.org

*"Going back to the Farm, walking the paths with old friends and tasting the fresh peaches brought back many memories, reminding me of how special this program is, which has provided such a strong inspiration and foundation for so many past apprentices, including my own work with community gardens in the Bronx. It was wonderful to have the chance to celebrate the 40th Anniversary, visit with past apprentices and thank the dedicated instructors and staff. To many more years of the Farm and Garden Apprenticeship program!"*

Ursula Chanse, Director, Bronx Green-Up and Community Horticulture, The New York Botanical Garden, Bronx, New York (*pictured here teaching planting skills*)

After lunch, apprenticeship graduates presented their efforts to help bring organics and sustainable agriculture into uncharted or less-traveled territory in the *Breaking New Ground* panel. Brian McElroy spoke about his work to expand the organic division of Driscoll's Berries, the largest berry producer (shipper/packer) in California. Melanie Okamoto described the School Lunch Initiative she heads as part of her work managing the garden and cooking nutrition education program at over a dozen schools in the Berkeley Unified School District—a program that is out front as a national model for not just sourcing school lunch food from local organic farms, but also linking the nutrition and food systems education with hands-on gardening. Amanda Rieux's presentation of music and images conveyed her amazing work to bring an organic garden and cooking program to school children in Hawaii. Godfrey Kosozi spoke about the organic farmer training program he started in his home country of Uganda as part of his organization's larger mission to address the environmental and health problems in his country. Leroy Musgrave, who came to the apprenticeship with a background in nutrition training, closed the panel with a description of his work to grow healthy food and provide nutrition education to the people who live in the inner city neighborhood of west Oakland, where liquor stores outnumber grocery stores 70 to 1. Said Lindsey, "Leroy is what I call a food hero, bring-

ing his organic vegetables and fruits to people without the easy access a lot of us take for granted."

The day's final panel offered a *Focus on Women Farmers*—one of the strengths of the Apprenticeship, which has trained more than 600 women in organic gardening and farming skills through the years. Claire Strader discussed the unique 5-acre farm she manages in Madison, Wisconsin, part of a 31-acre urban resource park that incorporates community gardens, prairie restoration, co-housing, children's garden programs, and research. Vernay Pilar Reber described the Sunnyside Organic Seedlings business that she founded in Richmond, California—one of the few fully organic nursery and greenhouse operations in the country. And Rebecca Slattery shared images of Persephone Farm in Indianola, Washington: like the dream of many apprentices, her small farm features a CSA program, farmers' markets, youth education, and an internship program.

The final symposium speaker was 1972 apprentice Oran Hesterman, Program Director for the Kellogg Foundation's Food Systems and Rural Development Program and incoming President of the Fair Food Foundation. Oran's inspiring talk laid out a historical framework for the current agriculture and food system, weaving in his personal journey and presenting a context for the powerful work of apprenticeship graduates around the country. He spoke of the Apprenticeship's ripple effect in this way:

"In many ways, this is where I received my inoculation—my understanding of my own purpose and role in helping us collectively learn how to feed ourselves while nurturing the earth for future generations.

Everywhere I travel in this country—and with my work at Kellogg Foundation supporting sustainable agriculture and food systems projects over the past 15 years I have traveled a lot!—I find others who received a similar inoculation here at UCSC as apprentices."

Buoyed by Hesterman's words and the other inspiring talks, the crowd made its way down the hill to the Farm for the Midsummer Night's Culinary Celebration with some diverting for a tour of the Garden. With the tunes of the Harmony Grits ringing out across the Farm's fields, guests enjoyed a steady stream of delicious appetizers prepared by Britt Galler and Jozseph Shultz, and many toured the Farm to catch up on the latest work taking place.

Dinner brought a parade of wonderful courses from chefs Forrest Cook, David Jackman, Rebecca King, Rob Morris, Jamie Smith, Julie Mitravich, Justin Severino, Susan Peterson, Convergence Catering, the UCSC Bake Shop, and a

John Fisher

**The Midsummer Night's Culinary Celebration brought hundreds of people to the UCSC Farm for dinner in the apple orchard.**

small army of helping hands, featuring produce from more than a dozen local organic farms—many of them started by apprenticeship graduates. It was an incredible sight to see: a sit-down dinner for more than 500 guests in the Farm's apple orchard, with fresh flower bouquets from the Farm & Garden gracing each table. As the nearly full moon rose and marimba band Kuzanga added their music to the mix, it was truly amazing to look around at the hundreds of people gathered whose lives had been touched by their time spent on this land.

Sunday morning saw the apple orchard transformed into an informal, al fresco conference center. Following breakfast, the sun burned away the fog as participants split into networking groups to discuss a variety of topics: women farmers, children's and youth gardens; social justice issues in agriculture; ecological landscaping; farm-to-institution programs; community supported agriculture, and other shared interests.

The ideas continued to flow as everyone gathered in the Farm's garden for a closing circle. Hundreds of clasped hands formed a human chain around the garden beds as Garden Manager Christof Bernau led the group in a series of appreciations—for the people, the land, the passion, and the work that has blossomed for 40 years, sparked by the energy of those both present and remembered. As we threw our hands in the air to the ringing cheers of "grow!" it was easy to envision this same scene taking place 10, 20, or 30 years from now, with an ever-growing circle of people committed to nurturing the land and their communities.

After lunch, many took advantage of the opportunity to tour local farms started by graduates of the Apprenticeship program. Our thanks to the busy farmers who hosted tours, and to the countless others who helped make this event a success. As has been true over our 40-year history, the work involved many hands and many efforts and the result was truly remarkable and the inspiration lasting.

– Martha Brown, Ann Lindsey

Gary Crandall, logo design

**For more on the Back 40 celebration, see casfs.ucsc.edu/back40/index.html**

BACK FORTY 40 years UCSC FARM & GARDEN

# Center Honors Congressman Sam Farr for His Visionary Support of Sustainable Agriculture

As part of our 40th Anniversary celebration, the Center honored Congressman Sam Farr for his early and visionary support of UCSC's agroecology and sustainable food systems programs in a ceremony at the UCSC Farm in October.

Long before the concept of agroecology was recognized in Sacramento, then-Assemblyman Farr "consistently and forcefully supported agroecology, small-scale family farming and the need to protect California's environment with ecologically sound farming practices," said Chancellor George R. Blumenthal.

Despite "skepticism and even criticism" from the powerful voices representing traditional agriculture, Farr secured the "seed money" that helped establish permanent state funding for UCSC's Agroecology Program in the mid 1980s and has been a champion of sustainable agriculture research and education ever since, said Blumenthal. "Without Sam's support, we would not have this exemplary and renowned program."

Blumenthal presented Farr with a certificate recognizing his decades-long support of the campus.

Calling UCSC's programs "near and dear to my heart," Farr said there was no place he would rather have been than on campus among the pioneers and contemporary leaders of sustainable agriculture.

Farr hailed UCSC's spirit of innovation and ability to accomplish a lot with minimal resources, and he credited UCSC leaders with fighting for agroecology, even when it meant taking on vested interests within the University of California system who wanted to confine agriculture programs to the Davis and Riverside campuses.

Reading from remarks he entered into the Congressional Record on October 4 to honor the 40th anniversary of sustainable agriculture programs at UCSC, Farr called the Center for Agroecology and Sustainable Food Systems (CASFS) "one of the most prominent centers of agricultural research and education in the world." In Congress, Farr has helped secure more than $3 million to support CASFS research and extension projects.

Farr has been a proponent of organic farming since his service in the Peace Corps in Colombia in the 1960s, when he saw the importance of helping people improve their ability to grow food. In UCSC's programs, he recognized the relevance of developing small-scale, intensive, organic food production systems.

Over the years, Farr has made several landmark contributions to UCSC's programs, and CASFS director Patricia Allen thanked him for his commitment to sustainable food and agriculture research and education. As host of the program, Allen read from remarks prepared by environmental studies professor Stephen Gliessman, who was unable to attend the ceremony because he was teaching a class. "We owe the existence of agroecology and CASFS to Sam, and it is up to us to continue to carry his vision of sustainable food systems forward," Allen read on behalf of Gliessman, who was the first director of agroecology and who holds the Alfred E. Heller Chair in Agroecology.


Carolyn Lagattuta

**Congressman Sam Farr was honored this fall at the UCSC Farm for his contributions to sustainable agriculture.**

Farr also authored the 1990 state law that established standards for organic food production and sales in California, which became the basis for recent federal organic food standards. In Congress, he has insisted that U.S. Department of Agriculture research stations include a focus on organic agriculture.

Former CASFS director Carol Shennan, a professor of environmental studies, thanked Farr for his recent support of research efforts, including UCSC's Central Coast water monitoring project that has helped farmers reduce pesticide runoff into the Monterey Bay National Marine Sanctuary, and for research on regional food systems.

As part of the celebration, Farr and garden manager Christof Bernau planted an heirloom climbing rose—the first in a new rose garden established in Farr's honor. An adjacent plaque honors Farr for his "visionary support of sustainable food and agriculture research and education."

– Jennifer McNulty

*To read Farr's Congressional Record statement honoring CASFS, see casfs.ucsc.edu/back40/othernews.html.*

# Sustainable Agriculture Education Association Debuts at Cornell Conference

The second national conference on Facilitating Sustainable Agriculture Education, held July 11–14 at Cornell University in New York, brought together nearly 200 educators and students to share ideas for improving sustainable agriculture education at colleges, universities, apprenticeship programs, and other settings.

The conference also marked the debut of the Sustainable Agriculture Education Association (SAEA). Center for Agroecology and Sustainable Food Systems (CASFS) graduates, students, and staff have played key roles in developing this new organization, whose mission is to ". . . promote and support the development, application, research, and exchange of best teaching and learning practices in sustainable agriculture education and curricula through communication, training, development, and collaborative activities for teachers and learners."

The burgeoning interest in sustainable agriculture education prompted the founding of the SAEA. "We did a survey of stakeholders around the U.S. before moving forward with developing the association," says Albie Miles, former curriculum editor at CASFS who helped organize the first national conference, held at Asilomar in 2006. "It was clear from that survey that there was a lot of interest in creating an organization that would help promote educational opportunities and move sustainable agriculture forward as a mainstream academic discipline," he says.

Although the SAEA was originally envisioned as a group that would promote sustainable agriculture programs at post-secondary schools, this year's conference attendees broadened that scope to include education at a variety of levels.

"I was impressed by how enthusiastic everyone was about not defining ourselves too narrowly," says Katie Monsen, a UCSC graduate student in Environmental Studies who has helped develop the new organization. "We had people there from universities, but also growers and others with educational programs. For example, people are really interested in getting high school students involved in order to increase enrollment in college agronomy programs; other say we need to start sustainable agriculture education even earlier—this opens us up to work with a broad range of folks."

That range was reflected in this year's group of conference participants, who came from throughout the country to share resources, discuss teaching methods, and create new networks. Monsen notes that despite the geographic differences, attendees found common ground in their educational goals. "We didn't have a lot of conversations about 'what is sustainable agriculture,'" she says. "Although there are certainly differences in regional cropping systems, people from across the country had very similar interests when it comes to creating educational opportunities."

Kathi Colen Peck

**Participants at the sustainable agriculture education conference in one of the event's Study Team sessions.**

In contrast to the typical "top down" approach to education, students have had a major voice in SAEA's development. UC Davis graduate student Damian Parr, a graduate of UCSC and the CASFS apprenticeship program, is a leading advocate for giving students an equal voice in developing sustainable agriculture programs. That goal is reflected in SAEA's statement of values, which include, "A focus on learning and the development of communities of co-learners," and "The democratization of knowledge and learning."

Next steps for the new organization include developing an online resource directory. "We want to make the web a place where people will be able to put up curricula, ask questions, post ideas and resources," says Miles. That effort is already underway, with resources shared at this summer's conference now available online (http://sustaged.mannlib.cornell.edu/index.jsp?home=1&primary=1).SAEA subcommittees are also working on student outreach, fundraising, and developing plans for next summer's conference, which will take place in the Midwest.

To get involved in the Sustainable Agriculture Education Association, contact Kim Niewolny (kln23@cornell.edu). To read more about this summer's conference, see http://www.hort.cornell.edu/SustAgEd/index.html.

– Martha Brown

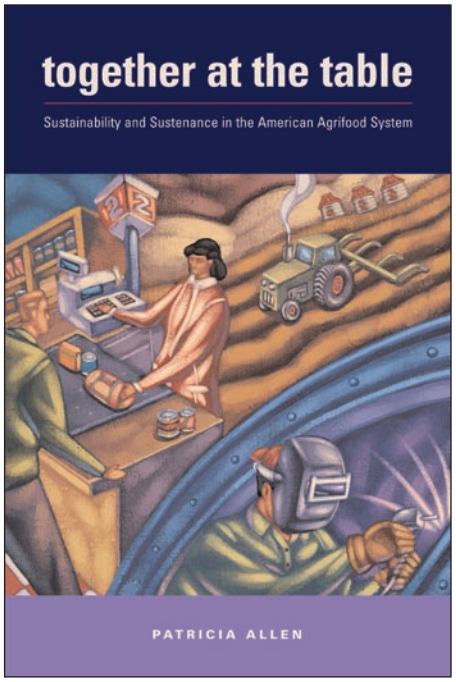
# Reflections on "Together at the Table: Sustainability and Sustenance in the American Agrifood System"

In *Together at the Table,* Patricia Allen provides a comprehensive and critical analysis of the potential for alternative agrifood movements to create substantial change in the entire food system.

She looks in particular at the sustainable agriculture and community food security movements as examples, weighing the strengths and weaknesses of each. The UC Sustainable Agriculture Research and Education Program (UC SAREP) was, happily, accurately showcased in the discussion of sustainable agriculture programs. Then, in the final chapter (which was my favorite), she suggests specific strategies for how we can all work together to improve and build the capacity of these movements for creating lasting changes that address all aspects of sustainability—ecological, economic viability, and social equity for all people in the food system.

In her conclusions, Allen points out two key areas we, in the sustainable food systems research/practitioner communities need to work on:

- Develop a broad-based vision for an alternative agrifood system that *goes beyond the traditional ideological framework*, and
- Continue to *broaden constituencies* and engage them in democratic processes that can provide *political power* to move us toward significant change in the agrifood system.




**Patricia Allen's groundbreaking work on the agrifood system offers a critical analysis of alternative food initiatives and recommneds actions needed to develop a sustainable food system.**

***Developing a broad-based vision.*** In Chapter 4, Allen articulately describes the dominant epistemological approach that guides research and education in sustainable agriculture programs. In a nutshell, this is a focus on natural sciences, production innovations, and farm-level projects, mostly at the expense of resources devoted to social equity issues (for example, connections with food security, marketing, food/ag policy, consumer and farmworker health). She points out that sustainable, agrifood systems research and education must be larger in scope and more truly interdisciplinary than the current involvement of mostly production-oriented natural science disciplines.

***Broadening constituencies.*** Allen also makes the case that we clearly need constituents that participate in local food system actions, *and* those that help us link local efforts in larger movements that involve national and international politics. Some of this is happening already through sustainable food and farm advocates that are working on the Farm Bill. We also need to be vigilant about enlarging our "circles" to include those left out of the discussion.

The new Agricultural Sustainability Institute (ASI) at UC Davis is one new promising organization for addressing the above concerns in California. Through its strategic planning process, the ASI is developing a broad-based vision that includes diverse stakeholders and encourages participation at all levels. Its vision, core values and operating principles attest to its commitment to be inclusive (see: http://asi.ucdavis.edu/strategicplanning.htm).

This may be one example of what Allen is saying in *Together at the Table*—that we need to work at many levels in the food system simultaneously from the local to the international. To do that well, we need many kinds of people with different expertise and local knowledge to be involved. Moreover, we need to acknowledge the importance of each of our contributions and communicate with each other effectively if we really want to make a lasting difference in changing our food system to one that is more sustainable and equitable.

– Gail Feenstra
Food Systems Analyst, UC SAREP

*Originally published in 2004,* **Together at the Table** *was released in paperback in 2007. 282 pages, $27.00. For ordering information, see the Penn State University Press website, www.psupress.org/books/titles/0-271-02473-9.html*

## Strawberry Pest Control Research Garners Federal Funding

Conventional strawberry growers rely on multiple applications of pesticides per year to control lygus bugs (*Lygus hesperus*), a pest capable of damaging berries badly enough to make them unacceptable for fresh market sale. According to CASFS entomologist and extension specialist Sean Swezey, typical control programs entail 6–8 biweekly calendar applications of insecticide per season, with costs capable of exceeding $500/acre. Yet even these efforts are beginning to fall short of controlling the pest, as lygus has started to display resistance to commonly applied insecticides in California.

Swezey and Charlie Pickett of the California Department of Food and Agriculture's Biological Control Program recently received a two-year grant from the USDA's Pest Management Alternatives Program (PMAP) to extend trap crop techniques developed in organic systems to conventional strawberry operations in an effort to reduce the need for insecticide applications. Trap crops of alfalfa offer lygus a preferred "host" plant: by establishing strips of alfalfa in strawberry plantings, growers can concentrate the pest in one place and control it with either a vacuum system or conventional sprays.

The PMAP grant will fund efforts by Swezey, Pickett, and CASFS research associates Janet Bryer and Diego Nieto to fine tune techniques they've developed over the past several years in organic operations using alfalfa trap crops combined with periodic trap crop vacuuming, supplemented by an introduced lygus parasitoid.

Colin Brown

**Lygus adults are drawn to alfalfa trap crops, which offer food and shelter.**

Colin Brown

**During feeding, lygus bugs such as this lygus nymph destroy developing embryos in the achenes (seeds) during early fruit development, causing the berries to become disfigured as they grow.**

In the organic research site, the team will determine the number of vacuum passes over an alfalfa trap crop that will optimize lygus removal. "We want to find out whether a significant or economically important number of lygus bugs are removed after each successive vacuuming pass," says Swezey. "We may find that the first pass or two removes the majority of the lygus present, and that further passes don't make enough difference in decreasing the remaining number of lygus to be justified." Establishing an optimal ratio of lygus bug reduction-to-tractor expense will help prevent unnecessary passes, thereby lowering labor costs and tractor operation expenses.

The research team will also determine the extent to which an introduced parasitoid of lygus, the braconid wasp *Peristenus relictus*, is helping control lygus populations in strawberry rows planted between strips of alfalfa. Introduced into a Central Coast organic strawberry operation in 2004, the wasp is now established at the site. Research efforts over the next two years will focus on the percent of lygus parastized by *P. relictus* in strawberry rows 1, 5, 10, 15, 20, and 25 (moving away from the trap crop planting).

In the 40-acre conventionally managed strawberry system, the researchers want to determine whether treating a trap crop with insecticides will control the pests effectively enough to decrease or eliminate the need to spray the crop itself. They also hope to determine the best way to manage a trap crop in a conventional system. "We want to optimize the way alfalfa plantings are managed to make them effective 'traps' for lygus throughout the season," says Swezey. This will entail mowing the crops to stimulate new growth and flowering during the summer as a way to enhance the alfalfa's attractiveness to lygus.

Alfalfa plantings have already been established for the upcoming field season at the organic and conventional research sites. Results of the study will appear in future issues of *The Cultivar*, and will be presented at grower field days planned for late 2009 and 2010.

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## New Research Brief Examines UCSC Community's Interest in Sustainable Food Systems

As interest in farm-to-college programs designed to bring local, sustainably produced food into college cafeterias grows, there is also a growing need to understand how to best address the interests and needs of the consumers served by such programs. The Center's latest research brief, *Farming the College Market: Results of a Consumer Study at UC Santa Cruz,* by CASFS social issues associate specialist Jan Perez and social issues specialist Patricia Allen, examines student, staff, and faculty's food-related concerns, interests, and level of support for specific food criteria, including whether they would be willing to pay more for food produced in an organic and "socially just" manner.

Write the authors, "Since the success of farm-to-college programs involves their ability to meet the needs of campus consumers, we undertook a study of our local campus . . . to learn about the perspectives and preferences of campus food consumers."

Perez worked with members of the campus's Food Systems Working Group, including UCSC Dining Services, Community Agroecology Network, and Students for Organic Solutions, to develop a web-based survey designed to find out what the UCSC community thinks about food system issues. Those responding to the survey included students (74% of the 415 total respondents), staff (18%), and faculty (7%).

Based on the online survey, the study found that food issues are important to the UCSC community, particularly regarding concerns for the environment and for people. Key points from this study include –

• There is significant interest in campus food that is nutritious, safe, supports workers, and is environmentally sound; interest in local food and GE-free food is lower.

• People are interested in sustainably produced food and a majority of people already purchase food with labels based on these criteria.

• Many people are willing to pay more (if necessary) for food that meets social justice criteria.

• A campus community is likely to be receptive to education and discussion about food-system issues.

• Since people had a great interest in nutrition and food safety, framing discussions of food-system issues in terms of health will meet people's needs as well as capture their attention for education on other food-system issues, such as working conditions and the environment.

The authors conclude that, "[Although] It would not be appropriate to extrapolate too much from a study of one campus . . . the results of the UC Santa Cruz study support the idea that colleges and universities are excellent choices for developing farm-to-institution programs and for popular education on food-system issues." A similar survey was recently distributed to a nationwide audience as part of CASFS research on farm-to-institution programs (see page 7).

## Study on Methyl Bromide Alternatives Expands with USDA Funding

Finding a non-fumigant alternative to the soil fumigant methyl bromide has been identified as a top priority by the California Strawberry Commission, and by growers who are facing the phase out of this ozone-depleting pesticide. However, most current state and federal research is focused on alternative fumigants rather than non-fumigant techniques to control soil diseases, weed seeds, and harmful nematodes.

Preliminary research conducted at the UCSC Farm has shown promising results with an alternative approach that starves pathogens and weeds of oxygen. Researchers introduce a carbon source such as chopped cover crops, wheat bran, or molasses to the strawberry bed, then irrigate and tarp the beds to create temporary anaerobic conditions. This technique, known as anaerobic soil disinfestation (ASD), has been tested for the past several seasons at the Farm and has been shown to control the soil pathogen *Verticillium dahliae*, a major diseases of strawberries.

A new study, funded by a grant from the US Department of Agriculture, will expand this initial work to examine the efficacy of various carbon sources, irrigation techniques, tarp types, and tarping periods to create sufficient anaerobic conditions to control weed seed germination and *V. dahliae*. The study, conducted by environmental studies professor Carol Shennan, UCSC researcher Joji Muramoto, and colleagues from California and Florida, will also look at using the technique to control diseases, pests, and weeds in Florida cropping systems, which also rely on methyl bromide.

The three-year study will take place on conventional farms so that results can be compared to those obtained with standard methyl bromide fumigation. Following an initial year of field trials in Watsonville and Oxnard, the research team will consult with local growers to determine which ASD options hold promise for larger-scale commercial application.

## Recent Publications by Center Staff

Work by members of the Center for Agroecology and Sustainable Food Systems has led to a number of publications in recent months.

From CASFS Director Patricia Allen and Community Studies professor Julie Guthman –

Allen, P., and C. Hinrichs. 2007. Buying into "buy local": Agendas and assumptions of U.S. local food initiatives. In *Constructing alternative food geographies?: Representation and practice*. Holloway, L., Maye, D. and Kneafsy, M., eds. Elsevier Press.

Allen, P. 2007. The disappearance of hunger in America. *Gastronomica* 7 (3): 19-23.

Allen, P., and C. Sachs. 2007. Women and food chains: The gendered politics of food. *International Journal of Sociology of Food and Agriculture* 15 (1): 1-23.

> *continues on page 27*

## Patricia Allen Appointed New Center Director

Patricia Allen has been named director of UCSC's Center for Agroecology and Sustainable Food Systems (CASFS) by Social Sciences Dean Sheldon Kamieniecki.

Allen, whose appointment took effect July 1, 2007, had been serving as acting director since January 2007. She joined the campus's Agroecology Program (renamed the Cetner for Agroecology & Sustaianble Food Systems) in 1984. She takes the helm from Carol Shennan, CASFS director for the past 10 years. Following her 2007 sabbatical, Shennan will continue at UCSC as a professor in the Environmental Studies Department.

Allen is one of the nation's leading scholars on the social aspects of sustainable food systems. Her work addresses issues such as labor, gender, and access to food. She is the author of *Together at the Table: Sustainability and Sustenance in the American Agrifood System* (University Park: Pennsylvania State University Press, 2004; recently released in paperback) and editor of *Food for the Future: Conditions and Contradictions of Sustainability* (Hoboken, N.J.: John Wiley & Sons, Inc., 1993).

Allen earned a B.S. in political economy of natural resources from UC Berkeley, an M.S. in international agricultural development from UC Davis, and a Ph.D. in sociology from UCSC in 1998.

## Apprenticeship Receives Top Honor in Sustainable Agriculture

In the world of sustainable agriculture, it doesn't get any better than the "Sustie" award, and the UCSC Apprenticeship in Ecological Horticulture took home the top honor at this year's Ecological Farming Conference.

Established in 1988, the "Sustie" award is presented each year by the Ecological Farming Association to "stewards of sustainable agriculture" who have made a significant contribution to the well-being of farming and the planet. Past recipients include chef Alice Waters, publisher Robert Rodale, and several graduates of the apprenticeship itself.

UCSC Farm manager Jim Leap and apprenticeship coordinator Diane Nichols accepted the Sustie on behalf of the apprenticeship during the conference's awards banquet on January 26 at the Asilomar Conference Grounds in Pacific Grove.

Jennifer McNulty

**Staff of the Apprenticeship program (standing, from left): Christof Bernau, Jim Leap, Nancy Vail, Orin Martin, Ann LIndsey; (kneeling, from left): Julie Stultz, Diane Nichols.**

"There are more than 25 extremely motivated and dedicated individuals who are instrumental in making the training what it is each year," said Leap. "All of us work collectively to teach and train and run the UCSC Farm, and it is all of us who will be sharing in the acknowledgment that this award represents."

The apprenticeship, which is celebrating its 40th anniversary this year, is the nation's premier hands-on training program in organic farming and gardening. Widely regarded as one of the most significant influences in the growth of sustainable agriculture, the six-month full-time program has prepared more than 1,200 graduates who have spread their expertise throughout the world.

"There's simply nothing that compares to the apprenticeship for the depth of its program or the breadth of its impact," said Sheldon Kamieniecki, dean of the Division of Social Sciences at UCSC, who attended the awards banquet.

Graduates of the apprenticeship go on to operate commercial farms and market gardens, run community and school gardens, and work at the forefront of international development, food policy, and social justice programs.

The impact of the apprenticeship is apparent in the number of graduates who have received Sustie awards, including Cathrine Sneed of The Garden Project in San Francisco; Wendy Johnson, garden manager at Green Gulch Farm in Marin County; Jim Nelson of Camp Joy Gardens in Boulder Creek; Gloria and Steven Decater of Live Power Community Farm in Covelo, CA; Orin Martin, manager of the Alan Chadwick Garden at UCSC; and Kay Thornley, who helped launch UCSC's Agroecology Program.

Its success is also evident in the number of similar college-based farm-training programs sprouting up at the University of Georgia, Michigan State University, Washington State University, the University of Montana, and other campuses.

> *continues on next page*

## Center Welcomes New Staff, Bids Farewell to Julie Stultz

The Center welcomed new staff members this year, and bade farewell to another.

Julie Stultz, our Farm Production Manager, moved to Seattle to pursue new opportunities. We'll very much miss her skills and knowledge as both a farmer and teacher. Liz Milazzo joins the staff as the new production manager, bringing extensive experience in organic farming systems.

Also on board is Tim Galarneau, our Food Systems Research and Education Program Coordinator. Tim has been instrumental in implementing sustainable food systems work at UC Santa Cruz's dining facilities through the Farm Systems Working Group (see update on page 9), and is playing a key role in expanding this work to the state and national levels.

Gwendolyn Keith joins us as the new Assistant to the Director for Research and Education, and is coordinating the Farm-to-Institution research project (see page 11). Her background includes organic farming in Minnesota for 10 years and work for a number of food, environment, and social justice organizations in the Midwest.

We were joined this fall by Bill Leland, in the new job of CASFS Development Director. Most recently the Executive Director of the Coastal Watershed Council, Bill also served as the Director of Community Development at the Santa Cruz Community Credit Union where he developed their successful non-profit arm, Santa Cruz Community Ventures. Welcome to all the new arrivals!

## Grants to Apprenticeship Support Salaries, Projects

The Apprenticeship Program has been awarded several grants that will help fund its core production, training, and education efforts in 2007–2008. We are grateful to the following foundations for their important support of practical training in organic farming and gardening and for helping to create a more sustainable food system.

• Newman's Own Foundation, with funding from Newman's Own Organics, has awarded a $50,000 grant for Apprenticeship staff salaries. This type of "general support" is truly essential to keeping the program running each year.

• A Wallace Genetic Foundation grant of $50,000 will help support the Apprenticeship's role in the Farm-to-College Sustainable Food Project at UCSC. This grant will support the Farm-to-College coordinator Nancy Vail and new Field Production Manager Liz Millazo as they grow organic produce for the campus dining halls, train apprentices and teach undergraduates about sustainable food systems, and create a model farm-to-college program.

• The True North Foundation's second year of a two-year grant will provide $30,000 for the Farm-to-College project as well as the Community Supported Agriculture (CSA) Education and Outreach project.

• $40,000 from the Marisla Foundation will fund Second-Year Apprentices' salaries and outreach to other sustainable agriculture educators through conference exhibit booths and presentations.

• Gaia Fund awarded a $30,000 grant to support the development of a new educational greenhouse on the UCSC Farm, Gaia's largest grant to the Center to date. The Stanley Smith Horticultural Trust also awarded $10,000 for greenhouse construction. These, along with a $60,000 grant from Newman's Own Organics for the greenhouse, came in late 2006.

• For the second year in a row an anonymous donor gave a $7,200 donation to the Apprenticeship that will support an international participant in the six-month training program. In 2007 the funds supported an apprentice from Zambia.

We also want to extend our gratitude to the Friends of the UCSC Farm & Garden for committing funds to support a Second-Year Apprentice this year as well as two scholarships for apprentices of color/low-income.

Former apprentices are also lending a hand to support the Apprenticeship program. Over $7,000 in gifts from almost fifty former apprentices has come in this year in support of the Apprenticeship and will be used this year for staff salaries.

Without grants and gifts like these, CASFS would not be able to run the annual training program and maintain the wonderful resources that are the UCSC Farm and the Alan Chadwick Garden. Please see our web site at http://casfs.ucsc.edu to find out more about the various programs and projects at CASFS and how to support them. To find out how you can contribute to our newest effort, the Apprentice Housing Project, please see the article on page 25.

## CASFS History Article Published in the Chronicle of the University of California

An article on the Center's history, "Growing a Program in Sustainable Agriculture at UC Santa Cruz," appeared in issue Number 8, Fall 2006 of the *Chronicle of the University of California*, a journal produced by UC Berkeley's Center for Studies in Higher Education. In the article, Center Director Patricia Allen and Senior Editor Martha Brown trace the history of CASFS from its 1967 roots as the Student Garden Project to the present.

To order a copy of the journal, contact the *Chronicle of the University of California* c/o The Center for Studies in Higher Education, University of California, Berkeley, Berkeley, CA 94720-4650. Phone: (510) 643-9210, http://cshe.berkeley.edu/publications/chronicleofuc.htm. You can also read the article on the CASFS web site, http://casfs.ucsc.edu

for the
# Gardener

# French Intensive Gardening: A Retrospective

*Editor's note: The year 2007 marks the 40th anniversary of Alan Chadwick's arrival at UC Santa Cruz and the founding of the garden that now bears his name. Here Chadwick Garden manager Orin Martin reviews the gardening methods that Chadwick introduced, their modifications, and their use at the UCSC Farm & Garden today.*

"The skin of the Earth must be approached with great sensibility. It is alive and it contains a spirit. It is easily bruised or damaged. In some respects, it is even more delicate than the bloom on the surface of a plum. Approach it without sensitivity, or at the wrong time, and you will damage it."

*- Alan Chadwick*

CASFS Photo Collection

**Alan Chadwick with students at the UCSC Student Garden Project, circa 1967.**

### HISTORY OF THE FRENCH INTENSIVE SYSTEM

The system of gardening we use here at the UCSC Farm & Garden has many names—biodynamic/French intensive; French intensive; raised bed gardening; the deep bed system; the wide bed system; Chinese intensive; bio-intensive—and many proponents. There are also many books about it, the best known of which is John Jeavons's *How to Grow More Vegetables than You Ever Thought Possible in Less Space than You Can Imagine,* and numerous period pieces (see references).

This system of raised bed, intensive gardening was essentially started here at UC Santa Cruz's upper garden (née the Garden Project) by Alan Chadwick in 1967. Keep in mind that at the time, raised bed gardening and even organics (let alone an organic food industry) were virtually unknown in the U.S. Now these techniques are commonplace, even to the point of the mechanized spader, which simulates single and double digging on a field scale.

The system was pioneered, not invented, by Chadwick. As he might have said, "There is nothing new under the sun" (only with a more dramatic, baroque flourish). It was Chadwick's synthesis based on his experiences and studies. He often talked of the literature and historical records of ancient cultures: Egypt, Mesopotamia (Iraq), China, and particularly the Greeks and Romans (the Roman poet Virgil's *Georgics* is a tome to agriculture and husbandry), and their various intensive cultivation techniques.

The most specific and oft-repeated analogy from Chadwick was from the early Greeks and their observations: that crops grew well in the river bottom valleys and floodplains, with their alluvial soil deposits. However, crops flourished and grew even more "lushly" at the edge of the valley, where there were "mini landslides" and slightly disturbed, better-aerated soil. This effect was even more pronounced on south-facing slopes. Whether this analogy was literal or apocryphal, it serves as a good image or metaphor for raised bed gardening, and the benefits of microclimate and site selection.

A mixture of diverse elements from Chadwick's personal experience, as well as his studies, also contributed to the amalgam he entitled biodynamic, French intensive horticulture. The principal determinants were: 1) The techniques of French market garden phenomenon in and around Paris starting in the 1500s and peaking in the late 1800s and early 1900s (French intensive); 2) traditional European garden-scale cultivation techniques, which had always been more intensive than their U.S. counterparts; 3) his own apprenticeships in English and French market garden operations; 4) tutelage under Rudolf Steiner, his spiritual philosophy as well as biodynamics—an attempt to look at a farm or garden as a living organism while studying cosmic rhythms and their effect on plant growth, soil quality, and nutritious food; and 5) a strong personal infatuation with art, attention to detail, and beauty. Chadwick was an aesthete, having sensitivity to all that was beautiful and a disdain for that which was ugly and dehumanizing. As he said, "The reason for all of it is simply that I love beauty . . . I adore beauty and I absolutely detest ugliness."

> *continues on next page*

In the 1970s, after Chadwick's departure from UCSC, the Farm & Garden staff quickly dropped the biodynamic portion of the system. The reasons being we had only a passing familiarity with the philosophy and, quite frankly, it seemed a little too abstruse and not empirical enough. So it became French intensive gardening. John Jeavons came along and put a reductive spin on the complex system Chadwick espoused, coined it biointensive gardening, and made it more palatable to a mainstream audience. Under the axiom "You can't teach an old dog new tricks," I've persisted in calling it French intensive.

### BUILDING SOIL WITH THE FRENCH INTENSIVE SYSTEM

Perhaps an overview statement might be helpful—let's define terms. The French intensive, raised bed style of gardening is a handworked system featuring deep cultivation (at least in the initial phases; see below). The primary techniques used are: single digging (12"–15" deep) and double digging (18"–24" deep).

This technique's primary effect is on the physical properties of a soil: the aim is to rapidly improve soil structure and fertility. Improved physical properties can positively influence the biological and chemical properties of a soil as well. The main idea is to create a well-drained, well-aerated, fertile soil structure by digging deeply and placing nutrients at specific levels. This gives rise to a profile that enables plant roots to probe/penetrate throughout the bed with ease, especially in a downward direction. Such an arrangement has a continuous system of large and intermediate pore spaces from the surface to the subsoil. Pore space is where soil air (to fuel aerobic growth) is located and where plant roots actually grow. Plants' needs for air, water and nutrients are best met with such a continuous system of pores.

The French intensive system (i.e., deep digging) is not appropriate in all soils and in all climatic situations. For instance, on deep, improved soils, it's superfluous, even deleterious. On sandy soils and in hot, windy situations it can "burn up" precious organic matter and cause water losses both through surface evaporation and excessive drainage. It is most effective on heavy clay soils and at rapidly deepening shallow soils.

CASFS Photo Collection

**Double digging a new bed at the UCSC Farm, circa 1971. Note that soil from the initial trench is piled into a wheelbarrow; it will fill the last trench in the bed.**

As is so often the case in life, there are no panaceas, but we tend to be creatures of habits, creatures of dosages; that is, we want to do the same thing in the same way, with the same amount, repeatedly. The judicious use of deep digging for a few years to develop a soil, followed by lighter, less disruptive surface cultivation and perhaps periodic renewal via deep digging again might be more prudent. Caveat emptor: Digging is a radical act, potentially destructive of soil structure and biological processes Do it skillfully and as infrequently as possible!

Conventional wisdom often states that it can take 1,000–2,000 years for 1 foot of topsoil to develop in place. With French intensive it is possible to simulate the creation of 1 foot of topsoil in 3–5 years (in conjunction with cover crops/green manures).

### PRIMARY FEATURES OF THE FRENCH INTENSIVE SYSTEM

*Permanent Beds*

Often when people hear French intensive, they automatically think of raised beds. In fact, the beds may be raised slightly (1"–2") or in an exaggerated sense (6"–8"), flat, or even sunken. The degree of "loft" is a function of climate, soil type, and seasonal weather. On a transect from Seattle to Santa Cruz to Santa Fe, the response might be: 1) Seattle, with its high annual rainfall and cool temperatures, can have dark soils with high organic matter and high clay content, and a tendency to remain cold and wet. Thus a raised bed would yield better growth, allowing the soil to warm more quickly. Santa Cruz, with its mild Mediterranean climate, dry summers and wet winters would feature a slightly raised bed during the rainy season and an almost flat bed in summer. Santa Fe might yield a flat or even sunken bed for water catchment, to minimize water loss and afford protection from wind.

Permanent beds, be they raised or flat, substantially reduce soil compaction. The bed equals the zone of maximum fertility—you could say "Don't tread on me," or only minimally and lightly. The path equals the zone of degradation, with much foot traffic and resultant compaction. Permanent beds foster maintenance of ideal soil structure. While compaction is a primary problem in mechanized agriculture, it can be virtually eliminated in handworked permanent bed systems. In agriculture, it can be said that the back of the tractor (disc, rototiller, etc.) is simply undoing the work (compaction due to weight) of the front of the tractor.

Some common causes of soil compaction are: ploughing—a "plow pan" develops just below the depth of tillage; 2) machine and foot traffic (human and grazing animals)—the bigger the machine, the greater the number of passes, the greater the compaction; 3) the pounding action of rain drops on open soil, which can destroy surface soil aggregates and lead to crusting and erosion. Natural forces

CASFS Photo Collection

**A double dug bed ready for planting at the UCSC Farm, circa 1971.**

also cause compaction—over time, the fine particles of clay leach downward, accumulate in layers, and create subsurface compaction or a hard pan.

Compaction can be measured by an increase in bulk density. Bulk density is a measurement of the weight of a volume of soil. It includes pore space as well as solids. It is distinct from particle density, which simply measures the weight of a soil as if there were no pore spaces.

Permanent beds also focus efficient placement of fertilizers/nutrients only where plants will be growing.

*Styles/Tools/Techniques of Cultivation*

Deep digging (if prudent): single and double digging with the vertical placement of nutrients at appropriate depths. A mantra for nutrient incorporation could be: "Apply nutrients at and slightly above the eventual effective feeding root zone of the crop being grown."

The hand tools of choice feature the D-handle spade for primary cultivation, i.e., digging; the tilthing fork for secondary cultivation, i.e., creating a particulate seed bed; and a metal bow rake for shaping the bed.

*Intensive Spacing of Plants and High Yield/Area*

French intensive can feature as great as 4–5x the plant density of traditional agriculture (alliums at 4–5x density, leaf crops at 2–3x density). An associated increase in yield/area can be expected. With greater plant density, it is essential to create an environment for root growth that allows a vertical (not horizontal) zone of exploration. Associated with this is a high rate of compost application (up to 1–2 lbs/sq. ft.) initially. Trying to put more plants in a given area without adequate soil preparation will only lead to stunted plants and poor yields.

*Intercropping*

Intercropping is an emblematic symbol of French intensive gardening. Intercropping is the growing together, simultaneously, of 2–3 crops so that the growth of one does not interfere with the growth of the others. This can also contribute to higher yields/area. Intercropping can also be a strategy for creating favorable microclimates, e.g.–

A bean fence (6'–8' tall) edged with one or two rows of lettuce (or any quick-maturing leaf crops). The shade of the beans moderates the heat of summer for the lettuces. Similarly, a bed planted with sunflowers at low density (2'–3' apart), underplanted with the lettuce.

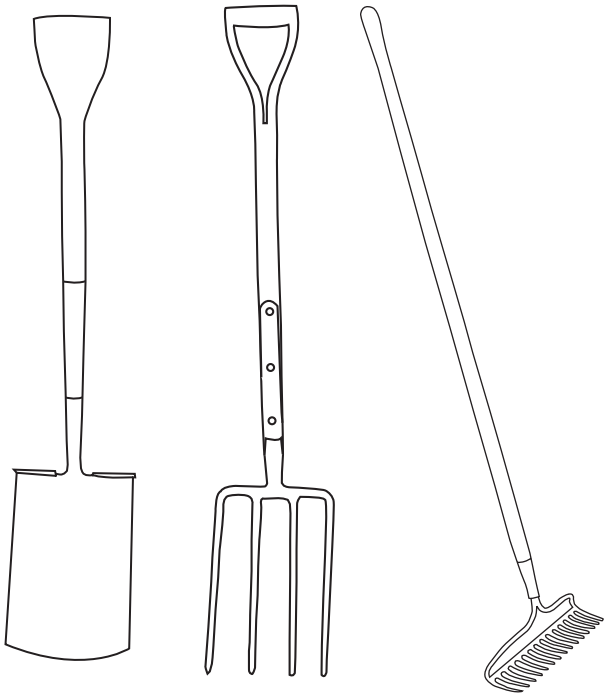
Relay cropping is a variation on intercropping, e.g., a row of basil side-planted on the outside of a pepper bed. The basil can be cropped for 1–2 months until the peppers take over above- and below-ground space. Another possibility is rows of radishes seeded between rows of carrots. The radishes emerge in 3–5 days and are cropped at 20–30 days. The carrots come up in 10–14 days, grow slowly past emergence and crop in 60–70 days. The possibilities are endless.

Although this sounds counterintuitive, intercrops work best when combining opposites:

- The fast with the slow (radishes/leeks)
- The tall with the short (beans/lettuce)
- The deep rooted with the shallow rooted (climbing peas/arugula)
- The heavy feeders with light feeders (leeks/radishes)
- The fibrous rooted with tap rooted (salad mix/carrots)

*The Use of Fully Mature Compost*

The more mature and particulate (fine) the compost, the greater and quicker the nutrient availability. This system is predicated on the ability to skim—remove a crop, prepare the bed and seed or transplant on the same day, leading to efficient, intensive use of available land. This is only possible with fully mature, particulate compost.



Cathy Genetti Reinhard

**The primary tools for double digging and bed shaping: D-handle spade, tilthing fork, and metal bow rake (illustrations not to scale).**

*A Soil Ethic, or an Insane Reverence for Soil* (see initial Chadwick quote)

As is so often the case in gardening, we are trying to emulate and amplify natural systems in such areas as plant diversity, intercropping, watering, soil structure, fertilizing, and creation of micro-climates.

Bare soil is not a natural phenomenon; mulches can conserve and enhance both surface soil structure and organic matter content. In the case of French intensive, the close spacing of the plants creates a living mulch canopy. Additionally, the concept of permanent beds and minimal stepping on the beds radically reduces compaction. But beyond a fundamental understanding of the science behind the physical and chemical properties of soil lies the notion of becoming a soil sleuth—a Sherlock Holmes of soil. Everywhere you go, you look, feel, touch, dare I say taste and think about soil. What type is it, sand, silt or clay, how deep is it, what color is it, how was it formed, how did it come to be here (movement, deposition, etc.)? Make some judgments as per its "value" or best use. Make it come alive and accessible to you—become a soil steward.

*Extensive Use of Transplants*

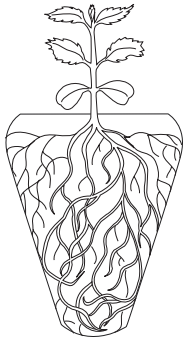
One hallmark of French intensive is that transplants make up a lion's share of plants grown, with direct seeding relegated to the root crops (e.g., beets, carrots). On average, the transplants are slightly bigger than the norm (this necessitates skill and care in transplanting). Transplanting has several advantages for the intensive gardener:

- More intensive use of land available by more precise placement of transplants and elimination of skips and gaps that often result from direct seeding.
- Transplants tie up the ground for a shorter period of time than direct seeding.

Example: A crop of lettuce is harvested from a bed. On the same day the bed is prepped, fertilized, and planted with broccoli transplants that are 6–8 weeks old.

- Transplants give plants a head start over weed pressure.
- It takes less labor and water to tend the transplants than seeds and small seedlings in the ground.
- Transplants allow a head start on the growing season.

Example: It takes 12 weeks to produce a transplantable allium (onion, leeks, scallions, etc.). Your first safe planting date for alliums is April 1. By starting the allium of your choice in containers in a greenhouse or cold frame January 1, you can transplant a sizeable seedling on April 1, thus hastening the time to maturation by 3 months over an April 1 direct-seeded allium.



Cathy Genetti Reinhard

**Successful French intensive gardening relies in part on carefully raised transplants with well-developed roots.**

*Evenness Principle*

The concept of evenness begets an environment that is uniform throughout the bed; all plants from the center to the edge receive a similar growing environment. The old adage is "Mind the corners and edges and the middle takes care of itself." The goal is to do everything evenly:

- Watering–spread and depth
- Cultivation (digging, loft, edging, tilling, raking and shaping)
- Compost application and depth of incorporation
- Seed sowing (distribution)
- Seed coverage
- Transplanting
- Weeding, hoeing
- Anon, anon, anon.

This applies to a flat, a bed, a field, a garden, a farm . . .

*Labor as Well as Plant Intensive*

Whatever name you choose to call it, this approach to gardening demands a finely attuned, highly skilled practitioner (that's us). Labor inputs are high, especially in developing poor soils. Hopefully this is a labor of love. We are all rank amateurs (one who practices a thing only out of love, from the Latin—lover of). Alan Chadwick's view was that gardens were an extension of the home and that gardening was an artistic, physical, spiritual discipline, a touchstone for a healthy culture.

In this 40th year since the founding of the garden, may we all perpetuate and renew that thought.

– Orin Martin

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# Funding Campaign for Apprenticeship Housing Receives Major Boost – Help Still Needed

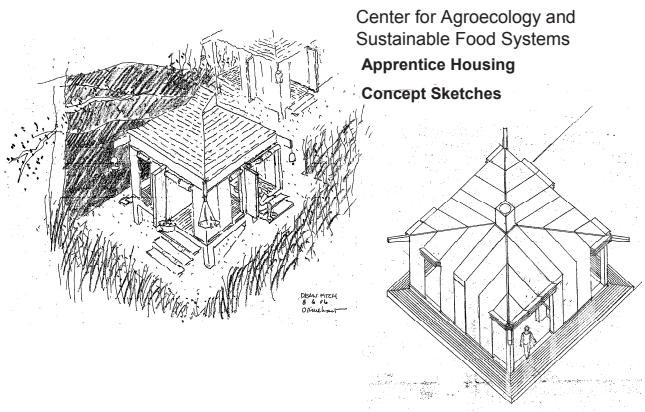
The Apprenticeship in Ecological Horticulture is one step closer to finally building permanent apprentice housing on the UCSC Farm, thanks to long-time Friends' member Olivia Boyce-Abel. When the campus approved the plans for eight 4-room cabins, the price tag that came with it was $487,000. Boyce-Abel not only pledged $40,000 from her *obaboa* Foundation for the project but also offered to help inspire other former apprentices and program supporters to give. She has put out a challenge that so far has more than matched her $40,000, with a total of $85,000 raised to date.

For those less familiar with the Apprenticeship, it is a six-month, full-time organic training for up to 38 apprentices from around the world. The roots of the program extend to the arrival of Alan Chadwick at UCSC 40 years ago, when he and a group of student "apprentices" created the Student Garden Project (now the Chadwick Garden; see more on page 1). Apprentices have traditionally been allowed to live on the farm in their own tents for the six months, sharing cooking and other chores in the Farm Center kitchen and dining room.

As a past apprentice and staff member, Boyce-Abel said that for her the planned apprentice housing demonstrated a new level of support from UCSC and a new, more permanent status for the Apprenticeship. When the campus approved the apprentice housing project, Garden Manager Orin Martin said, "This represents staying power." The apprentice tent cabins, planned as "light-on-the-land," appropriate technology structures tucked in behind the plum orchard, will give the program a solid foundation.

Donna Murphy

**Olivia Boyce-Abel talks about the important role of the Apprenticeship and the need to support the Apprenticeship housing project at the Back 40 celebration this summer.**




**Artist's rendering of the Apprenticeship housing project planned for the UCSC Farm. Each unit will house four students during the six-month Apprenticeship training program in organic farming and gardening.**

Olivia's challenge inspired a $20,000 gift from 1978-79 apprentice Meg Cadoux Hirshberg and her husband Gary Hirshberg (co-founders of Stonyfield Farm Yogurt Company), whose gift amount allows them to name one of the cabins. Phyllis Anderson, a 1967-70 apprentice and a Friends member, pledged $5,000 which entitles her to name one room of a cabin, as will Jeannine Bonstelle Bassett's $5,000 gift through the Silent Gong Fund. Many other apprenticeship graduates and Friends of the Farm & Garden members have also supported the project with gifts and pledges. With these gifts, added to the Center facilities funds set aside for this purpose and funds brought in through this summer's Back 40 event, more than half the needed $487,000 has been raised.

For more information about supporting the Apprentice Housing Project, including different donation options and naming opportunities, please contact: Bill Leland, CASFS Development Officer, Social Sciences Division, UC Santa Cruz, 1156 High Street, Santa Cruz, CA 95064; wleland@ucsc.edu; (831) 502-7274. Should you be inspired to donate now, please send a check to the above address made out to the UCSC Foundation with "Apprentice Housing Project" in the memo line. Online credit card gifts may be made at http://giveto.ucsc.edu.

– Ann Lindsey

Literature

# Sighted

**Agroecology: The Ecology of Sustainable Food Systems, *Second Edition*,** and

**Field and Laboratory Investigations in Agroecology, Second Edition,** by Stephen R. Gliessman

The new edition of this groundbreaking textbook is intended to reach a broad national and international audience and teach the ecological foundations for sustainable agriculture.

The textbook is designed for use in undergraduate-level courses in agroecology or sustainable food systems. The text's grounding in ecological science is solid enough, however, for it to be adapted for use in a basic ecology course. It is written for students with some knowledge of the life sciences, yet can be understood by a diligent non-science major.

For ordering information, see www.crcpress.com/us/. When the book and manual are used together for course adoption, there is a special "bundled" price available. Please contact CRC/Taylor Francis Group textbook sales agents for special price information, 1.800.272-7737 or 1-561-994-0555 (outside the Continental USA), or email orders@taylorandfrancis.com.

**Confronting the Coffee Crisis: Fair Trade, Sustainable Livelihoods and Ecosystems in Mexico and Central America,** edited by Christopher M. Bacon, V. Ernesto Méndez, Stephen R. Gliessman, David Goodman, and Jonathan A. Fox

From the MIT Press web site: "Our morning cups of coffee connect us to a global industry and an export crisis in the tropics that is destroying livelihoods, undermining the cohesion of families and communities, and threatening ecosystems. *Confronting the Coffee Crisis* explores small-scale farming, the political economy of the global coffee industry, and initiatives that claim to promote more sustainable rural development in coffee-producing communities. Contributors review the historical, political, economic, and agroecological processes within today's coffee industry and analyze the severely depressed export market that faces small-scale growers in Mexico and Central America."

The book presents a series of interdisciplinary, empirically rich case studies showing how small-scale farmers manage ecosystems and organize collectively as they seek useful collaborations with international NGOs and coffee companies to create opportunities for themselves in the coffee market. The findings demonstrate the interconnections among farmer livelihoods, biodiversity, conservation, and changing coffee markets. Additional chapters examine alternative trade practices, certification, and eco-labeling, discussing the politics and market growth of organic, shade-grown, and Fair Trade coffees. Combining interdisciplinary research with case-study analysis at scales ranging from the local to the global, *Confronting the Coffee Crisis* reveals the promise and the perils of efforts to create a more sustainable coffee industry.

Contributors: Christopher M. Bacon, David B. Bray, Sasha Courville, Jonathan A. Fox, Stephen R. Gliessman, David Goodman, Carlos Guadarrama-Zugasti, Shayna Harris, Roberta Jaffe, María Elena Martinez-Torres, V. Ernesto Méndez, Ellen Contreras Murphy, Tad Mutersbaugh, Seth Petchers, José Luis Plaza-Sanchez, Laura Trujillo, Silke Mason Westphal.

Editors: Christopher M. Bacon is a Researcher and Lecturer associated with the Agroecology Group as well as both the Latin American and Latino Studies and Sociology Departments, University of California at Santa Cruz; V. Ernesto Méndez is Assistant Professor in the Environmental Program and Department of Plant and Soil Science at the University of Vermont; Stephen R. Gliessman is Alfred Heller Professor of Agroecology at the University of California, Santa Cruz; David Goodman is Professor of Environmental Studies at the University of California, Santa Cruz; Jonathan A. Fox is Professor in the Latin American and Latino Studies Department at the University of California, Santa Cruz.

*Confronting the Coffee Crisis* will be available in February of 2008 from MIT Press (http://mitpress.mit.edu). 400 pp., $27.00.

**Agroecology in Action: Extending Alternative Agriculture through Social Networks,** by Keith Douglass Warner, with a foreword by Fred Kirschenmann

From the MIT Press web site: "American agriculture has doubled its use of pesticides since the publication of Rachel Carson's Silent Spring in 1962. Agriculture is the nation's leading cause of non-point-source water pollution—runoffs of pesticides, nutrients, and sediments into streams, rivers, lakes, and oceans. In *Agroecology in Action*, Keith Douglass Warner describes agroecology, an emerging scientific response to agriculture's environmental crises, and offers detailed case studies of ways in which growers, scientists, agricultural organizations, and public agencies have developed innovative, ecologically based techniques to reduce reliance on agrochemicals."

*Agroecology in Action* shows that agroecology can be put into action effectively only when networks of farmers,

scientists, and other stakeholders learn together. Farmers and scientists and their organizations must work collaboratively to share knowledge—whether it is derived from farm, laboratory, or marketplace. This sort of partnership, writes Warner, has emerged as the primary strategy for finding alternatives to conventional agrochemical use. Warner describes successful agroecological initiatives in California, Iowa, Washington, and Wisconsin. California's vast and diverse specialty-crop agriculture has already produced 32 agricultural partnerships, and Warner pays particular attention to agroecological efforts in that state, including those under way in the pear, winegrape, and almond farming systems.

The book shows how popular concern about the health and environmental impacts of pesticides has helped shape agricultural environmental policy, and how policy has in turn stimulated creative solutions from scientists, extension agents, and growers.

*Agroecology in Action* is available from MIT Press (http://mitpress.mit.edu). 291 pp., $25.00.

**Building the Green Economy: Success Stories from the Grassroots,** by Kevin Danaher, Jason Mark, and Shannon Biggs

*Building the Green Economy* shows how community groups, families, and individual citizens have taken action to protect their food and water, clean up their neighborhoods, and strengthen their local economies. Their unlikely victories — over polluters, unresponsive bureaucracies, and unexamined routines — dramatize the opportunities and challenges facing the local green economy movement.

Co-author Jason Marks is a graduate of the CASFS Apprenticeship program and now co-manages the Alemany Farm in San Francisco (www.alemanyfarm.org), as well as serving as editor for the environmental quarterly *Earth Island Journal*. Says Mark, "Our book tells the inspiring stories of individual citizens, families and community groups that achieved unlikely victories in the fight to bring environmental sustainability and economic fairness to such vital areas as water management, food, toxics, urban renewal, clean energy, and local politics. As we write: 'The green economy is no longer some quaint sideline. It is the most rapidly growing sector of the economy.'"

Look for *Building the Green Economy* at your local independent bookstore; for ordering information and an essay by Mark, see the Powell's Book website, www.powells.com/essays/mark.html. 242 pp., $16.00.

## Research Updates

*continued from page 16*

Allen, P., and J. Guthman. 2006. From "old school" to "farm-to-school": Neoliberalization from the ground up. *Agriculture and Human Values* 23 (3): 401-415. (Article published with accompanying commentaries).

Guthman, J., A. Morris, and P. Allen. 2006. Squaring farm security and food security in two types of alternative food institutions. *Rural Sociology* 71(4).

From Environmental Studies professor Steve Gliessman and CASFS researcher Joji Muramoto –

Gliessman, S. R. 2007. Agroecology: the ecology of sustainable food systems, 2nd edition. CRC/Taylor Francis Group.

Gliessman, S. R. 2007. Field and laboratory investigations in agroecology, 2nd edition. CRC/Taylor Francis Group.

Muramoto, J., and S. R. Gliessman. 2006. Bioindicators: use for assessing sustainability of farming practices. *In* Encyclopedia of pest management, David Pimentel, ed. Marcel Dekker, Taylor & Francis Group, LLC. pp. 1-5.

From CASFS social issues associate specialist Jan Perez and researcher Phil Howard (now on the faculty at Michigan State University) –

Perez, J., and P. Howard. 2007. Consumer interest in food system topics: implications for educators. *Journal of Extension*, Vol. 45 No. 4.

From CASFS extension specialist Sean Swezey, and research associates Janet Bryer, Diego Nieto, and Polly Goldman (now with the USDA's research station in Salinas, California) –

Swezey, S., P. Goldman, J. Bryer, and D. Nieto. 2007. Six-year comparison between organic, IPM and conventional cotton production systems in the Northern San Joaquin Valley, California. *Renewable Agriculture and Food Systems* 22(1): 30–40.

From Environmental Studies professor Carol Shennan and CASFS researcher Marc Los Huertos –

Ruehl, C. R., A. T. Fisher, M. Los Huertos, S. D. Wankel, C. G. Wheat, C. Kendall, C. E. Hatch, and C. Shennan. 2007. Nitrate dynamics within the Pajaro River, a nutrient-rich, losing stream. *Journal of the North American Benthological Society*, 26(2):191–206.

Santa Cruz area
# events

**▶ Fruit Tree Pruning Workshop,** Saturday, January 19, 2008, 10 am–1 pm, UCSC Farm

Fruit tree experts Jeffrey Caspary and Matthew Sutton will show you how keep your fruit trees healthy and productive at this lecture and demonstration workshop. Wear warm clothes and bring a snack; heavy rain cancels. $15 for Friends of the Farm & Garden members; $20 for non-members, payable the day of the workshop. *Note: Makeup date is January 26 if the January 19 event is rained out.*

**▶ Fruit Tree Q & A,** Saturday, February 2, 10 am–12 noon, Lumberman's (formerly San Lorenzo Garden Center), 235 River St., Santa Cruz

Bring your fruit tree questions to this free Q&A session with fruit tree expert Matthew Sutton, founder of OrchardKeepers. Matthew will discuss varieties, pruning, fertility, and general fruit tree care techniques.

*For information on the Santa Cruz area events, call 831.459-3240, email jonitann@ucsc.edu, or see casf.ucsc.edu*

**▶ Medicinal Herb Workshop,** Saturday, March 22, 10 am–1 pm, Louise Cain Gatehouse, UCSC Farm

Learn about the abundance of herbs growing in local gardens. Darren Huckle, a Western/Chinese herbalist and licensed acupuncturist, will teach you about sources of medicinal plants, how to use garden herbs for health and wellness, and how to plant and harvest herbs. $15 for Friends' members; $20 for non-members, payable the day of the workshop.

**▶ Bread Baking Workshop,** Sunday, April 6 17, 11 am–2 pm

Erin Justus, founder of Companion Bakers, will teach you the basics of baking great bread. This hands-on workshop will cover ingredients, sourdough starters, shaping loaves, baking times, and other tips. $20 for Friends' members; $25 for non-members.

Please pre-register for this event by Tuesday, April 1 by calling 831.459-3240 or send email to jonitann@ucsc.edu. Location details will be sent upon registration.

## California

**▶ 28th Ecological Farming Conference,** January 23–26, 2008, Asilomar Conference Grounds, Pacific Grove, CA

This annual conference brings together organic farmers, marketers, activists, and sustainable consumers for one of the largest events of its kind.

The 2008 Eco-Farm theme is "Root Values: Connecting Ecology, Community and the Land." The conference features more than 50 workshops on innovative farming techniques, organic farming issues, and sustainable food systems topics. A special workshop for businesses, "Lighten Your Distribution Footprint," is also planned.

This year's conference will include two "mixers" sponsored by CASFS members on Post-Secondary Agriculture Education, and K-12 Education.

For more information on the Eco-Farm Conference, including a detailed schedule and registration information, see www.eco-farm.org, or call 831.763-2111.

**▶ 21st California Farm Conference,** February 26–28, 2008, Visalia, CA

The theme of the 2008 California Small Farm Conference is "Growing Opportunities." Write conference organizers, "While small farmers continue to face many challenges, they are also finding unprecedented opportunities. The growing interest in locally-grown food and supporting sustainable food systems offers great promise for the small farmer who is able to produce a high quality product and market it effectively to consumers hungry for California-grown foods."

Conference topics will include cultivation, water conservation, pest management, business development, USDA opportunities, and marketing. In addition, workshops will be offered that address the particular issues facing new farmers, experienced farmers and farmers' market managers.

For conference details and registration information, see www.californiafarmconference.com, or call 1.888.712-4188.

266

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