



# News & Notes of the UCSC Farm & Garden

Issue 141, Spring 2014

SPRING PLANT SALE PREVIEW

## Cultivating Resilience in Your Backyard

– by Dan Tebes

So far in this water year, which runs from October 1, 2013 – September 30, 2014, the UCSC Farm has received a total of 15.98 inches of rain, or about 40% of our total water year average. As a result we're taking a number of steps at the Farm and Alan Chadwick Garden to deal with this year's drought conditions, and we're all becoming more aware not only of local and statewide water challenges, but also the worldwide impact of changing weather patterns and the need to use water wisely.

That awareness extends to our selections at this year's Farm & Garden Spring Plant Sale, coming up on May 3 and 4. Cultivating wise water use and awareness can begin in the backyard, and we'll be featuring plants that offer local gardeners the chance to grow their own food and flowers while creating a more resilient garden designed to respond to the challenge of a limited water supply.

UCSC's Demeter Seed Library will also hold a free seed exchange at this year's plant sale and we'll have information on hand for those interested in learning how to save seeds from their own plantings. There will be information about water-conserving gardening techniques as well as staff and apprentices to answer any planting questions. See pages 3 and 4 of this issue for more information on the sale, which takes place at the corner of Bay & High Streets at the base of the UCSC campus.

### Low-Water-Use Annual Vegetables

Many of the annual vegetables offered this year are "water-wise"—

- Leafy greens, such as Swiss chard, kale, and collards can all grow well with minimal water.
- Many solanums, including peppers, tomatillos, ground cherries, and tomatoes, can go many days without irrigation as they enjoy large "swings" between wet and dry periods in the soil.
- Dry-farmed tomatoes are a great way to concentrate flavor while reducing total water use. Characteristics to look for in a dry-farmed tomato variety include a thick skin (to minimize fruit "cracking"), a deep root system (to find water and nutrients), and good overall productivity (which is typically cut in half by dry-farming). Garden manager Christof Bernau recommends 'Sungold', 'Cherokee Purple', 'Black Krim', and 'Valley Girl' (which is a good substitute for the hybridized 'Early Girl' tomato variety).
- Some cucurbitas, such as pumpkins, winter squash, and cucumbers, can do well with minimal water. Although not typically considered low-water crops, when planted into soil that has received adequate pre-irrigation before planting, the cucurbita varieties available at our plant sale are good "foragers" for water, using extensive root systems to tap into water reserves held in soil aggregates and organic matter particles.

### Drought-Tolerant Perennials

*Baccharis pilularis* 'Twin Peaks' – Fast-growing, tough, and extremely dense, this greenery landscape plant, also known as "dwarf coyote bush," is an ideal native evergreen ground cover and an incredible resource for beneficial insects. Drought tolerant, with only monthly watering needed, it will grow 3–5 feet tall and easily 8 feet wide.

*Ceratostigma griffithii*, Burmese Plumbago – This small, hardy Himalayan native shrub produces striking true-blue flowers with red accents summer through fall. Grows 2–3 feet tall and wide. Good for attracting beneficial insects.

*Cuphea* 'Big Red' and 'Kirsten's Delight' – Sporting beautiful red, purple, and blue blooms, cultivars of this semi-woody shrub can grow 6–7 feet tall and be dry farmed when established.

*Ribes sanguineum glutinosum* – Also known as flowering currant, this *Ribes* cultivar will grow to 8 feet tall. It produces stunning bright pink flower clusters.

*Vitex agnus-castus* – The "chaste tree," a Mediterranean native, can grow 8–10 feet tall and wide, producing deeply divided leaves and breath-taking purple-blue flowers.

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*Salvia argentea* 'Artemis' – With deep wooly-gray foliage, this drought-tolerant salvia is commonly known as "silver sage." It stands 6–12 inches tall, and produces a white and pink bloom mid-summer of the second year.

### Low-Water Annual Flowers

These flowers grow well with minimal water inputs, producing beautiful blooms that extend late into the season.

Amaranth, 'Love Lies Bleeding' – Ruby-red droplets hang from deep green foliage. This sturdy, 3–5 feet tall heirloom amaranth cultivar looks great in a bouquet.

California Poppies – A delicately beautiful flower with four silky-textured petals that range in color from pearl-white to an egg-yolk gold, the California Poppy is a pleasant addition to any garden. This California native will thrive with little to no water.

Marigolds – Known for their vibrant yellows, oranges, and reds, and having long held important spiritual significance in Aztec, Mexican, and Hindu cultures, marigolds are ideal for making elaborate wreaths, garlands, and bouquets. Flowers are made up of multiple overlapping layers of petals. Native to the Americas, marigolds are easy to grow.

Mignonette – A clustered, creamy-white flower known for its spicy fragrance. Mignonette is native to the Mediterranean region and southwest Asia, stands 12–14 inches tall, and can be used in fresh-cut or dried bouquets.

Cosmos – With lavenders, pinks, magentas, and whites, cosmos offer gardeners a water-friendly way to add soft and abundant pastel colors to any garden.

### Water-Conserving Practices

There are a number of practices you can use to conserve water in the garden. For example —

- Plant drought-tolerant or low-water-use varieties.
- Experiment with dry farming. It's best to start with recommended varieties and plant families. Also, check the water deficit to see if additional pre-irrigation is needed prior to planting. And finally, don't forget to "dust mulch" by tossing fluffy soil around your crops.
- Build soil organic matter (SOM) and soil aggregates. SOM helps hold water in the soil, increasing the soil's overall water "reserve." Soil aggregates are particles of soil held together, in part, by SOM that is decomposing or that has already been decomposed.

By building good soil aggregates, you increase the space between the soil particles (pore spaces) where water is primarily held and where most plant roots take up water. Incorporating a cereal/legume cover crop mix in the spring and using compost are great ways to increase organic matter and soil aggregation.

- Put down some mulch. You can cut down on water and weeds by applying woodchips, unfinished compost, leaf litter, paper, cardboard, or plastic mulch. On a small

scale, consider applying 3+ inches of loose mulch to maximize mulching benefits. It's best to moisten paper-based mulch directly after applying to keep it in place.

- Install a drip-irrigation system. Up to 95% efficient and extremely versatile, drip irrigation can be installed around trees, shrubs, flowers, and vegetables. It provides an effective, easy, and customizable watering method, from the backyard garden and orchard, to the field scale. Visit the UCSC Farm and Garden to get ideas on designs from our various drip systems, or stop by a local garden center for advice and supplies.

- Know when to water. At the UCSC Farm and Garden, we limit "overhead" sprinkler irrigation to the hours of 8–10am and after 5pm. These times provide ideal conditions (less wind and heat) for increasing the efficiency of any sprinkler system.

- Catch that rainwater. Consider installing a rain-water catchment system that could include an above- or below-ground plastic barrel, a gravity-fed swale, or a series of berms that directs water toward fruit trees or other plantings.

- Repurpose domestic water. This can include using a bucket in the shower and a dish tub in the sink to catch and recycle water, or putting in a graywater system to irrigate landscape plants.

### Responding to the Drought

At the UCSC Farm & Garden, we've adopted a multi-faceted approach to dealing with this year's drought that includes recording weekly water use, comparing and interpreting water use data, and modifying farming and gardening plans and practices, as well as many of the practices mentioned above. As field production manager Liz Milazzo explains, "We take seriously our challenge of continuing to try to grow the most nutritious food with the least water and the challenge of increasing healthy food access in our community."

To help improve water use efficiency at the UCSC Farm, the Center for Agroecology & Sustainable Food Systems (CASFS) recently received grant funding from the UCSC Carbon Fund and the UCSC Committee on

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# Spring/early Summer Calendar of Events

## UCSC Farm & Garden Spring Plant Sale

*Saturday, May 3, 10 am – 3 pm, and*

*Sunday, May 4, 10 am – 2 pm*

*Barn Theatre Parking Lot, UC Santa Cruz*

**Note: Friends of the UCSC Farm & Garden have pre-entry priority, Saturday, May 3, 9 am – 10 am**

Enhance your home and garden with organically grown flower, herb, and vegetable starts as well as perennial landscape plants. This year's selections include a variety of low water-use annuals and perennials.

Friends' members receive 10% off all plant and merchandise purchases. Use your Plant Sale receipt for a 10% discount at Companion Bakeshop during the week following the sale. Please remember that we can only accept cash or checks for purchases, no credit cards. See cover story and page 4 for additional details.

## Demeter Library Quarterly Seed Exchange

*Saturday, May 3, 10 am – 2 pm, and*

*Sunday, May 4, 10 am – 2 pm*

*Barn Theatre Parking Lot, UC Santa Cruz*

This year's Spring Plant Sale includes a free heirloom, open-pollinated seed exchange hosted by UCSC's Demeter Seed Library. Get information on saving seeds from your own crops and pick up seeds to grow out for your garden and for the seed library.

## Tillage Workshop for Beginning Farmers

*Monday, May 19, 2 pm – 5:30 pm UCSC Farm*

In this lecture and demonstration workshop, farmer-educators Jim Leap and Darryl Wong of the Center for Agroecology and Sustainable Food Systems (CASFS)/UCSC Farm will focus on primary and secondary tillage tools and techniques as they fit in a farm system.

This workshop is free and open to all beginning and experienced farmers. Please contact Melissa Betrone at 831.459-3695 or mbetrone@ucsc.edu to sign up and get additional information and parking details.

*This event is supported by a grant from the USDA's Beginning Farmer and Rancher Development Program.*

*If you'd like more information about these events, need directions, or have questions about access, please call 831.459-3240, email casfs@ucsc.edu, or see our web site, casfs.ucsc.edu.*

*UCSC student participation in workshops is supported by UCSC Measure 43 funding.*

*Sponsored by the UCSC Center for Agroecology & Sustainable Food Systems (CASFS), and the Friends of the UCSC Farm & Garden.*

## A Garden of Poetry and Music

*Saturday, June 21, 12 noon – 2 pm*

*Alan Chadwick Garden, UCSC*

Join us in the historic Alan Chadwick Garden and enjoy the talents of our region's poets and musicians. This is a wonderful way to celebrate the Summer Solstice! Free admission, snacks provided.

## Making & Using Compost

*Saturday, July 12, 1 pm – 4 pm Alan Chadwick Garden*

Compost can do wonders in the garden, from improving soil fertility and structure to conserving the water you apply. Join Orin Martin and Sky DeMuro of the Alan Chadwick Garden to learn how to make and use compost to enhance the health and productivity of your garden and landscape. Get hands-on practice in building a successful compost pile.

Cost of the workshop is \$20 for Friends of the Farm & Garden members (pre-registered) or \$30 (at the door), \$30/\$40 general admission, \$15/\$20 for UCSC students and limited income. Register online at [compostclass.bpt.me](http://compostclass.bpt.me), or send a check made payable to UC Regents to: CASFS/UCSC Farm, 1156 High Street, Santa Cruz, CA 95064. Attn: Compost Workshop.

## Selecting, Growing & Arranging Cut Flowers

*Saturday, July 19, 1 pm – 4 pm*

*Alan Chadwick Garden, UCSC*

Join experienced flower growers and bouquet makers Sky DeMuro and Molly Dillingham of the Alan Chadwick Garden to learn how to select, raise and arrange cut flowers from your garden to create beautiful bouquets. The workshop will include both lecture and hands-on practice as you make a bouquet to take home.

Cost of the workshop is \$30 for Friends of the Farm & Garden members (pre-registered) or \$40 (at the door), \$40/\$50 general admission; \$25/\$35 UCSC students and limited income. Cost includes \$10 materials fee. Register online at [flowerclass.bpt.me](http://flowerclass.bpt.me), or send a check made payable to UC Regents to: CASFS/UCSC Farm, 1156 High Street, Santa Cruz, CA 95064. Attn: Cut Flower Workshop.

### Get Your Share in the 2014 CSA Program!

The UCSC Farm's Community Supported Agriculture (CSA) program runs for 22 weeks, early June-late October (weather permitting). Boxes include same-day harvest of a wide range of vegetables and fruits, including strawberries and blueberries, plums, apples and pears. A pick-your-own herb and flower garden is offered to members at the UCSC Farm pick-up site.

Shares for the 2014 season cost \$560, and include 8-12 items per week. Payment can be made in full, or divided up into two or four installments. Limited-income and "late season" shares at \$280 are also available. In 2014 we will once again accept SNAP/EBT Benefits.

If you'd like to receive our CSA Brochure and Pledge Form or have any questions regarding the CSA program, please contact Amy Bolton at 831.459-3240 or email [farmcsa@ucsc.edu](mailto:farmcsa@ucsc.edu). More information and the CSA Brochure and Pledge Form are also available at: <http://tinyurl.com/FarmCSA2014>

### Hay Barn Project Update

Drive through UCSC's main entrance and up the road onto campus and you might notice a change in the skyline. Over the course of about a month this spring, the historic Cowell Ranch Hay Barn was carefully dismantled. The salvaged lumber now sits stacked and tarped for future use in the reconstructed barn. Timberframe experts documented every step of the process involved in taking apart the 1860s-era structure.

According to a recent UCSC News release, the 4,800-square-foot barn was constructed of massive timbers connected by mortise and tenon joinery, a carpentry art common in New England in the 1800s but rare at the time in California. A new barn will rise on the same spot replicating the construction methods but with modern materials, including a concrete slab.

"This is the most exciting project that's happened here in a long time, because the craftsmanship is so tangible and so beautiful," said UCSC campus architect John Barnes in the release.

The disassembly of the Hay Barn is step one in a process that will eventually lead to a new headquarters for the Center for Agroecology and Sustainable Food Systems (CASFS) and other south campus environmental and sustainability programs, and a new "front door" for the CASFS/UCSC Farm.

The Hay Barn re-use plan is part of a multi-year project made possible by a \$5-million gift from the Helen and Will Webster Foundation, and we are grateful for the foundation's generous support. You can read more about the project at: <http://news.ucsc.edu/2013/03/hay-barn.html>

### Introducing the Friends' Business Affiliates Program

The Friends of the UCSC Farm & Garden have initiated a new partnership with local and regional businesses. The Business Affiliates program offers partners the chance to support one of the nation's most celebrated organic farmer training programs and its UCSC Farm & Alan Chadwick Garden facilities, while reaching an audience that values organic farming, gardening, local businesses, and a healthy lifestyle.

Jacob's Farm/Del Cabo, The Local Life, and Companion Bakeshop have joined the effort as charter members. When asked why their business joined the program, Brendan Meile of Jacob's Farm responded, "In our focus as a company, organic and sustainable agricultural practices are a priority and we value the Farm and Garden Apprenticeship training program as a really good tool to promote these principles and practices. We look at the Friends of the Farm & Garden as a way to extend that message."

We welcome your business's participation in this new program. Find out more about the Business Affiliates effort and what it can offer your business by going to: <http://tinyurl.com/FFGbiz>.

Questions? Call Anne Hayes at 831.502-7274 or [adhayes@ucsc.edu](mailto:adhayes@ucsc.edu), or Melissa Betrone at 831.459-3695 or [mbetrone@ucsc.edu](mailto:mbetrone@ucsc.edu).

### FRIENDS' MEMBERS - ENJOY EARLY ENTRY AND DISCOUNTS AT THE PLANT SALE

Put your Friends' membership to great use by enjoying early entry to the UCSC Farm & Garden's Spring Plant Sale on Saturday, May 3. Friends' members have shopping priority from 9 am to 10 am, with the sale opening to the general public from 10 am to 3 pm. On Sunday, May 4, the sale will open to everyone from 10 am to 2 pm. Friends' members also receive a 10% discount on all plant and merchandise purchases.

If you're not sure whether your membership will be current for this year's sale, take a look at the mailing label of this newsletter. If it says May 2014 or later, your membership will be current for the sale.

If your membership expires in April 2014 or earlier, you can renew it at the sale on Saturday morning starting at 8:30 am. You can also access a membership form and an online renewal link at: <http://tinyurl.com/FFG2014>.

Call 831.459-3240 or send email to [casfs@ucsc.edu](mailto:casfs@ucsc.edu) if you have any questions about the status of your membership.



# Apprenticeship Updates

## Meet the 2014 Apprentices

Here's a brief introduction to the new group of apprentices that joined us on April 14 from across the U.S. and overseas. For the next six months they'll be learning organic farming and gardening skills at the UCSC Farm & Garden.

Your membership in the Friends of the UCSC Farm & Garden helps fund this 47-year-old internationally known training program by providing funds for scholarships, teaching staff, equipment, and facility improvements. Many thanks for your ongoing support.

**Kana Azhari:** I'm an organizer, healer, educator, and cultural worker. My experience working in urban farms in East Oakland, California, sparked my interest and commitment to building sustainable food systems in the inner city. I look forward to gaining valuable hands-on training and experience in the field of urban and rural agriculture, food security and land-based sustainable economies.

**Nitza Bernard:** I currently live in Los Angeles, California. I am the gardening teacher and farm manager at Highland Hall Waldorf School, where I blend Biodynamics and Permaculture in my farming practice. My goals for the Apprenticeship are to expand and sharpen my farming skills in order to create a farm educational center of my own.

**Mike Bolio:** I live and work in Needham, Massachusetts, for The Charles River Center, a nonprofit social service agency that provides advocacy and services to children and adults with developmental disabilities. My goal is to develop a gardening/farming training program for individuals with developmental disabilities involving individualized home garden installation, a hydroponic greenhouse providing a year-round CSA program, and a farmstead community where people with and without disabilities will live, work, and socialize.

**Isabel Borman:** I call Ketchum, Idaho, home but live in Durango, Colorado. I am eager to challenge myself to grow beyond experiences gained through non-profit work, biodynamic farming, cooking, and outdoor pursuits. I seek opportunities to get my hands in the soil, collaborate with like-minded people and learn to think critically in new ways. I aspire to incorporate all I learn into a self-sustaining healthy life that combines community service, cultural knowledge, business and mindfulness.

**Sarah Bush:** A passion for sharing great food led me to design vegetable gardens and edible landscapes in my home state of Tennessee, and then to Alaska where I managed the greenhouse and gardens for a backcountry lodge for three summers. Goals for my Apprenticeship experience include filling the gaps in my farming knowledge and connecting with other inspired growers.

**Katina Castillo:** Living in Oakland, California, I recently left my position at the Community Justice Network for Youth to pursue my passion for reclaiming traditional healing practices that are part of my heritage and prioritize the cultivation of organic food and medicinal plants. My vision is to promote healing for youth in juvenile justice populations by emphasizing the intersectionality of racial, economic, environmental, and gender injustice.

**Hetty Chin:** I grew up in Oakland, California. Concerned about the staple of youth in my community, I pursued Nutrition Science for undergraduate studies. My desire to learn about the causes and effects of our food system in context to our bodies and the world has led me to work with youth and environmental nonprofits, and now here with the Apprenticeship program, where I hope to contribute to a balance between conservation, health, and economics.

**Scott Codey:** I am a former Brooklynite and "recovering" community organizer turned farmer and bread baker. I spent two years working on a permaculture farm in New Hampshire and then worked last summer as the farm manager at a farm in Vermont, all the time acutely aware that the last time I took a class in botany or horticulture was before the internet was invented. I'm hoping to learn a bit more about the science of... well, just about everything.

**Barrie Cohen:** My interest in farming began when studying abroad in New Zealand and participating with WWOOF (Willing Workers on Organic Farms). Since then I have apprenticed on farms in Long Island, New York, and Blachly, Oregon. Originally from New York City, I am excited to continue working and living on the west coast.

**Joan Coleman:** I grew up in Seattle, Washington, and moved to Santa Cruz two and a half years ago. I've been a trainee at The Homeless Garden Project since September 2011. I intend to pursue a career involving food justice, and I hope to use the knowledge I acquire at the Apprenticeship program to aid in that pursuit. I am very interested in food and nutrition with an emphasis on fermentations.

**Mitch Coppin:** I live in Loomis, California, where I raise California Red Sheep and have a small vineyard. My reason for attending the Apprenticeship is to learn how to grow crops in an environmentally responsible way. My dream is to establish an organic vegetable and flower farm cooperative where urban farmers can participate in planting, growing, harvesting and retailing the produce they grow.

**Cleo Moraia Corley:** California born, I grew up in Paso Robles and now live in Oakland. After completing an internship at Redwood Roots Farm in Humboldt County, California, I just can't keep my hands out of the dirt. I hope to apply the skills I learn in the Apprenticeship toward building autonomy in my community and challenging injustices in the food system.

**Roosevelt Edwards Jr.:** I served during and post Vietnam era, and am an Army Disabled War Veteran of Merced, California. The VA has added more educational benefits, which gives me an opportunity to increase my knowledge in Ecological Horticulture through the Apprenticeship program. My intentions are to take that knowledge and put it to use on our "Family Farm" in Humphrey, Arkansas, and to teach family members, relatives and other people within the community who are willing to learn the horticulture trade.

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**Steven Eisenhut:** Home for me is the diverse “Be Love Farm” in Vacaville, California. I am apprenticing to learn about animals, produce, orchards and Biodynamics. I intend to start producing and raising food for myself and consumers after my Apprenticeship experience.

**Julie Farrell:** I am originally from Tacoma, Washington, and went to school in New York City. I have worked in horticulture since age fifteen, and while my academic life was spent studying Mandarin, the two interests eventually melded. I currently work with organic farmers in Chengdu, China, researching agrarian lifestyles and introducing aspects of ancient, sustainable traditions to urbanites. I hope to meld this and knowledge gained during the Apprenticeship on my own farm someday!

**Luke Garrison:** I live in Mill Valley, California, and have worked at Studio Velo, a local bike shop, for the last 7 years. During this time I have worked in different parts of the world as a WWOOFer, including nearby Slide Ranch Farm, Seedsavers Network in Byron Bay, Australia, and Haleakula Garden Farm in Maui. Last summer I started a compost system, garden and greenhouse both at my house and for the owner of the bike shop.

**Zach Glenn:** I have been working for the National Park Service for the last three years as an Interpretive Park Ranger, but am now looking forward to switching towards a career in organic farming. I am interested in establishing an organic farm operation where people can also come and rediscover their connection with nature.

**Christine Hadekel:** I’m from Montreal, Canada, but live in Dublin, Ireland, where I work as a nutrition and food security advisor for Concern Worldwide, an international nonprofit. I’ve worked with food security projects in sub-Saharan Africa, India, and the U.S. As an apprentice I hope to develop my organic farming skills so that I can become a more effective educator and support the revitalization of community food systems.

**Mae Joseph:** I am originally from Boston, Massachusetts and began farming in Vermont two years ago. Most recently, I was a full-time apprentice at Green Meadows Farm in Hamilton, Massachusetts. I am very excited to be moving to California for this opportunity to learn more about organic farming. One day I hope to operate an interactive farm-to-table getaway.

**Alyssa Kahn:** I’m a Los Angeles, California, native and earned my Master Gardener certification last spring. Previous experience includes working with the Gowanus Canal Conservancy in New York and the Garden School Foundation and MEND Poverty Center in Los Angeles. I’m passionate about improving public health through increasing community access to fresh and healthy produce and I would like to apply the knowledge obtained in the Apprenticeship in order to teach others to establish independent food networks.

**Lauren Kaplan:** I live in Brooklyn, New York, where I do Brooklyn-y things like make yogurt and grow peppers on my roof. I also work for a nonprofit learning farm in Battery Park, where I manage aspects of program development and all Youth Education programs and write the monthly newsletter. I plan to advocate for sustainable agriculture through educating, growing, and eating—and by having such a blast that I inspire others to do the same.

**Samuel Karlin:** I live in Oakland, California. Most recently I was working at Mosaic, an online renewable energy crowd-funding/investment platform. However, food is my passion and I am excited to return to agriculture and deepen my understanding of sustainable food systems and policy. I want to work toward a world in which healthy and sustainable food traditions are valued and affordable for everyone.

**Rachel Klepner:** Currently I am living in Ipswich, on the North Shore of Massachusetts, working at Appleton Farms, a CSA and Dairy. I grew up in New York City and knew very little about farming until I attended Earlham College in Indiana. There I fell in love with growing vegetables for myself and others. This season I hope to experience many different farming methods and techniques to better equip me for running my own organic farm and/or managing a farm operation.

**Jane Kuhn:** Spending much of my time the past few years as a transient farmer on the East Coast, I am looking forward to a full season of learning with CASFS to better equip me in fulfilling my future goal of facilitating a farm that creates direct avenues of access to wholesome food for all. I’ve most recently worked at an outdoor education center in southern California, and the American Horticultural Society in Washington, D.C.

**Xamuel Lara:** I live in South Central Los Angeles, California, where I work for the non-profit South Central Farmers Cooperative. We are a cooperative of organic farmers that offer affordable organic produce in low-income communities. My goals for attending the Apprenticeship program are learning how to maintain soil fertility, create a more dignified food system, network with like-minded folks and bring the knowledge back to my community. Each one teach one.

**Matthew Lockey:** I live in Gunnison, Colorado. I am a Veteran of a Foreign War, and have lived in six states and on three continents. I currently have been working on several business concepts, including Permaculture and Vertical Farming. My goal while attending the Apprenticeship is to gain a deeper understanding of farming and horticulture so that I can immediately implement this knowledge into my family-owned company, Manus Entelechy & Biodiversity, LLC.

**Armi Macaballug:** I have always been fascinated by innovative solutions in health and economic empowerment for underserved communities. For the past two years, I have been studying sustainable design and nutrition to explore the patterns of nature and biology that inspire a holistic approach to creating solutions. My goal as an apprentice is to develop practical and technical skills in agroecological systems to help support communities in designing resilient and sustainable food systems.

**Kellee Matsushita:** I’m a garden educator, community organizer, and artist from Los Angeles. I work at the Network for Healthy California demonstration garden in Van Nuys, California, and teach gardening and nutrition classes to residents in Sylmar, California. My goal in attending the Apprenticeship program is to acquire skills to create a viable farm education program for urban teens that provides mentorship, career training, and the skills to build healthy, resilient communities.

**Bridget Ann Matz:** Recently, I have spent much of my time volunteering in local community gardens. My volunteer experience has led to a deep desire to attend the UCSC Ap-

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## **Building Resilience/Plant Sale Preview**

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Sustainability and Stewardship (CSS) Working Group to install soil monitoring equipment (which includes soil moisture sensors, data loggers, and lysimeters) at the Farm's research and production fields. The new equipment will help apprenticeship staff, students, and researchers identify how water moves through the soil at any given hour during the season, as well as more accurately determine how much water is being absorbed by plants and how much water is being lost to the atmosphere. Darryl Wong, the CASFS Farm site and research lands manager, is excited about this new technology, which he believes will complement current experience-based metrics for gauging soil moisture content, and help staff further fine-tune their irrigation practices to meet plant needs while minimizing water use.

"We use treated water from the City of Santa Cruz," says Liz Milazzo, "so our big concern is assisting the City's efforts to reduce consumption this season to protect storage in the reservoir. We're anticipating meeting a 15–20% reduction in use during the peak months of May through September."

Milazzo explains ways that she and her field team will meet these reductions, which include reducing the overall planted acreage and increasing water efficiency. "We've switched some orchard crops from overhead irrigation to drip irrigation, we're dropping some thirsty crops [this season], and we're reducing the acreage planted to less productive crops. We plant successions every two weeks over the summer, and have the flexibility to cut back on planting goals as necessary to meet water restrictions."

She also notes the importance of supporting local growers who are facing tough times due to the water shortage. "This is a time to support local CSA and organic farms," Milazzo believes, "and to strengthen our community base. Some farmers on the coast are in difficult conditions ... this is the time to pull together."

In the hand-worked gardens at the UCSC Farm, garden manager Bernau is faced with the challenge of improving an already water-efficient growing system. He and his team of second-year apprentices have worked to identify and repair leaks and system inefficiencies, and have been experimenting with plastic and paper mulch, which has the "added benefit of cutting down on weed pressure while also increasing water retention in the soil," says Bernau.

In addition, Bernau plans to convert 99% of the garden's irrigation needs to drip irrigation using drip tape and to adjust the time at which water is applied to later in the day. He and his team have also re-examined the crops they plan to plant this summer, reducing the amount of water-intensive crops.

Bernau also stresses the importance of knowing which crops benefit from large "swings" from wet to dry periods, including tomatoes and peppers, and which crops need more consistent irrigation, such as cucumbers and melons.

## **Water Access, Agriculture, and Social Justice**

Earlier this month, the Intergovernmental Panel on Climate Change (IPCC) released a fifth assessment report on the state of climate change and international efforts to curtail emissions and mitigate climatic effects. "We already have evidence of climate change around the globe," Milazzo points out, citing this IPCC report. "We have to do a lot to adapt to droughts and other climate change impacts." The report outlines a sobering reality—that climate change is advancing faster than the most extreme predictions put forward by the panel previously, and that the associated outcomes of these advances are being seen as increased instances of extreme weather patterns, such as the current drought.

As the frequency of severe drought increases, fewer people have access to a consistent supply of fresh water. As a result, fresh water access is becoming an issue of social justice. Internationally, the IPCC/United Nations expects millions of people will lose access to fresh water as a direct result of changing weather patterns due to climate change (U.N. 2012). As Milazzo points out, "There are unequal impacts of climate change on the poorest populations in the world."

"We have taps that we can turn on," Bernau says, "and this is not the case for many people, particularly women who are burdened with carrying water many miles daily. We should treat [water] and the infrastructure we have as a gift."

In addition, the FAO estimates that several hundred million smallholder farmers could be negatively impacted by climate change, the majority of whom will experience extreme weather conditions. Approximately 60 percent of agriculture in the world relies on rain as the only source of irrigation, which means millions of people are at risk as the frequency of droughts increase (FAO 2011).

This year's Spring Plant Sale, with its emphasis on water-saving plants, techniques, and awareness, is one local response to a global issue. We hope to see you there.

*Dan Tebes is a Second-Year Apprentice focusing on row crop production at the UCSC Farm this season*

*The City of Santa Cruz Water Department's website lists information on water conservation, inexpensive rain barrels, rebates on hose shutoffs, appliances, and lawn replacements and more. See [www.cityofsantacruz.com/index.aspx?page=395](http://www.cityofsantacruz.com/index.aspx?page=395)*

*Water-Smart Gardening in Santa Cruz County: This website offers a list of drought-tolerant plants, water-saving irrigation systems, watering tips, and more: [www.santacruz.watersavingplants.com/](http://www.santacruz.watersavingplants.com/)*

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### **2014 Apprentices** (from page 6)

prenticeship Program. I would like to use my Apprenticeship education to work in the nonprofit sector as an educator in community outreach programs to benefit low-income families and at-risk youth in our area.

**Eliza Milio:** I have lived in and loved this little town of Santa Cruz since 2008, when I originally arrived from Los Angeles, California to pursue a UCSC degree in Environmental Studies and Agroecology. When it comes to farming I find it essential to revel in the sunrise, be barefoot whenever possible, taste everything, grow flowers (!!!), and finally, crack a beer when the work is done.

**Devin Murphy:** I was born in Santa Cruz, California. As a teenager, I interned at the UC Santa Cruz Farm and Garden for three years. I graduated from UC Berkeley, where I studied agroecology, social theory, and South Pacific history, and was most recently working on farms in Hawaii. In the future, I hope to attend graduate school, while also keeping my hands in the dirt!

**Bruno Nell:** I live in Felton, California and work as an independent and community do-all, from carpentry to gardening. The outdoors are a part of my daily life as is my commitment to the process of mental refinement through self observation. The goals by attending the Apprenticeship program include expanding my knowledge, practical and mechanical, and bringing the experience to my local community and back to my small community in North Coastal Peru.

**Jessica E. Price:** A social scientist by training, I've spent many years managing health and research programs in Africa. I now want to shift my focus from public health (narrowly defined) to environmental wellbeing (inclusive of human health). A lengthy values-clarification process led me to sustainable food systems and the Apprenticeship. Combining social science with eco-horticulture skills, I hope to contribute through action-oriented research that identifies and addresses behavioral, operational, and policy barriers to sustainable and equitable practice.

**Patrick Rhodes:** I live in San Francisco, California, and currently work as a fine arts shipping coordinator. I also volunteer

as a project leader for Quesada Gardens Initiative, a community organization bringing people together through gardening and neighborhood improvement projects. My main goal for attending the Apprenticeship is to explore the possibilities for a career in agriculture.

**Zoe Sanchez:** I live in San Jose, California and am an eager young farmer, excited and ready to "learn by doing." My goal is to leave this program with a thorough, in-depth understanding of organic farming and all of the beautiful details that go into the creation of food. I want to develop a critical, strategic perspective that, alongside my expanded skills and knowledge, will enable me to turn my dream of farming into an instant reality.

**Judith Scott:** I'm a GMO educator and food activist, and just recently completed certification in Permaculture in Los Angeles. I'm deeply interested in soil remediation, herbalism, Chinese plant medicine and women's health.

**Blake Smith:** For the past six years I have worked in Uganda as the Executive Director for Akola Project. My work there was to provide skills training and economic opportunities for more than two hundred rural women. I chose to enroll in the Apprenticeship to increase my hands-on skills with agricultural systems and extend my knowledge to farmers in the developing world (hopefully somewhere in Latin America).

**Alexander D. Vaughn:** I am originally from Albany, New York, but have been farming at Red Fire Farm in Granby, Massachusetts, for the last three seasons. My hope is that the Apprenticeship will fill in the gaps of my agricultural education thus far and deepen my farming experience. My aim is to take all of what I've learned and apply it to a farm attached to a food bank.

**Mary Liz Watson:** I'm a native of South Carolina and recently finished my Peace Corps service in northern Ghana, where I worked with farmers to generate alternative income through activities including beekeeping and intensive moringa cultivation. As an apprentice, I hope to gain more technical farming skills to put me on the path to one day operate my own teaching farm where I can help children learn healthy living practices and become environmental and community stewards.