



News & Notes of the UCSC Farm & Garden

Issue 131, Fall 2011

Center for Agroecology
& Sustainable Food Systems

Your Soil—A Primer, with Some Strategies for Sustainable Management

— Orin Martin

“For in the end we will conserve only what we love.
We will love only what we understand.
And we will understand only what we are taught.”
— Baba Dioum, Senegalese conservationist

Although we tend to take it for granted, human society is principally possible only because the earth’s crust is “dusted” with a thin and often fragile layer of life-supporting material on which we can grow food: the soil.

Soil is often thought of as an inert substrate, useful in propping up plants and a mere vehicle for applied fertilizer and water. It is, in reality, a distinct *ecosystem*, defined as a system formed by the interactions of a community of organisms with their physical environment.

Two distinct parts of the soil—the biotic and abiotic components—function together to form a stable system. The biotic, or living (or that which was once alive) component is comprised largely of living plants, living organisms (macro and micro), and organic matter (plant and animal residues), which can be fresh, partially decomposed, or fully stabilized (humus). Soil’s abiotic component is made up of minerals, air, and water.

By understanding the soil’s ecosystem, gardeners can harness and promote the biotic components with judicious additions of compost and “green manures” (cover crops worked into the soil) to create a healthy environment for plant growth, and thus virtually eliminate the need to apply purchased fertilizer. This can lower costs—both out of pocket and environmental.

In this article I’ll introduce the soil’s four basic components and three major properties, talk about how these interact, and discuss ways that gardeners and farmers can improve their soils by learning how to become “biological growers.”

Soil’s Four Components

When you pick up a handful of soil, only half of that volume is solid material (minerals and organic matter). The other half should be pore space occupied by air (25%) and water (25%). Thus soil consists of four basic components:

1. **Mineral** (45%, + or -, by volume): The mineral component of soil consists of rocks ground down over geologic time as a result of physical, chemical and biological actions. Think of it as rock or stone “flour.”
2. **Organic matter** (5%, + or -): Organic matter is made up of a wide range of organic (carbon-containing) substances, including living organisms, plant biomass, and the carbonaceous remains of organisms and plants. Some soil microorganisms break down the remains of plants, animals, and other microorganisms; others synthesize new substances.
3. **Soil air** (25%): Soil air occupies the interstitial spaces between soil particles. Its primary role is to provide oxygen to fuel the aerobic (oxygen-requiring) activities of microorganisms and plant roots. Soil bacteria that associate with roots of legumes such as beans and peas use the nitrogen component of soil air to “fix” nitrogen in a form that plants’ roots can assimilate (free nitrogen fertilizer!).
4. **Water** (25%): Soil water or the soil solution carries dissolved nutrients that flow to and are actively intercepted by plant roots. Thus the soil solution is the vehicle for nutrients to “flow” into plants and, along with the products of photosynthesis, “grow” the plant. As plants are merely supported columns of water, the soil solution also gives plants their turgor and rigidity.

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Soil's Three Distinct Properties: Physical, Chemical, and Biological

Physical properties of soil are divided into *texture* and *structure*.

Soil texture is a physical measurement of the percentage of sand, silt, and clay particles in a soil (as determined by grain size, with sandy soils being the largest and clay the smallest). It is a given, and cannot be altered.

Sandy soils usually feature low nutrient- and water-holding capacity and an associated lower organic matter content. On the plus side, sandy soils drain well, warm quickly, and allow early cultivation and planting in the spring. Clay soils are the opposite: they carry high levels of nutrients and water, but are often difficult to work. You can determine soil texture by a simple field “feel” test called *ribboning*, or have it measured with a lab soil test.

If you have an extreme soil texture—a “sieve-y” sand or adobe clay—be of good cheer, for as legendary English gardener Alan Chadwick once said, “All soils are beautiful.” I’ve amended that statement to add, “However, some soils are more beautiful than others. And any soil can be radically improved by the addition of organic matter and skilled, timely digging or plowing.”

Soil structure refers to the arrangement of individual soil particles (sand, silt, clay) into aggregates or “clumps”; ideally, it takes the form of a granular or crumb structure. An apt analogy would be a sliced profile of a loaf of whole wheat bread. Such a structure features an amalgamation of small, intermediate, and large, stable aggregates. Some major contributors to stable aggregates and good soil structure are:

- The addition of organic matter—fresh, as green manures, and stabilized, as finished compost. Organic matter is a feedstock for soil microorganisms that break down the organic materials and in the process exude mucilaginous glues and slimes that help bind soil particles into stable aggregates. Plant roots, both living and decomposed, also contribute “binding” substances to the system.
- Timely and skilled cultivation techniques—rough plowing or digging physically forces soil particle contacts, beginning the process of aggregation. Organic matter contributes to stabilizing the aggregates that form. Note: Too much cultivation (especially secondary cultivation, or pulverizing) damages soil structure, as does working a soil when it’s too wet.

Chemical properties of a soil measure its nutrient-carrying capacity and pH (acidity). These are best determined by a soil test.

Biological properties of the soil refer to the “community of creatures” that live in and form the soil, principally bacteria, fungi, and actinomycetes (microorganisms that are especially effective in breaking down hard-to-decompose compounds, such as chitin). As farmers and gardeners, we continually find ourselves in both perpetual service to and in reverence of that community.



Alan Chadwick Garden manager Orin Martin describes soil properties to students in the spring 2011 Garden Cruz class.

While the three properties of soil are discreet, they are also synergistically interactive—think in terms of a Venn diagram.

Some examples:

- By providing a “feedstock” for soil’s biological components with compost, green manures, and fertilizers, you stimulate microbial populations. These microbes break down organic matter with their “enzymatic jaws” so that it can be dissolved in soil water and taken up by plants for growth. The microbes, in turn, die and contribute their own organic materials to the organic matter content of the soil. Thus by “working smart instead of hard,” as Buckminster Fuller once said, you improve the chemical property of your soil by promoting the biological properties.

- Similarly, by adding organic matter at least once a year, and using timely, skilled cultivation techniques, you create good soil aggregation and improve soil structure (a physical property). This creates large, continuous “pore spaces” in the soil; with their balance of air and water, these pore spaces create a favorable habitat for the microbes and plant roots that live and grow there. Thus you harness the physical properties of a soil to create and maintain hospitable conditions for soil organisms and plants (the biological properties).

A Biological Approach to Managing Soils

In Europe they refer to organic growers as biological growers, which is probably a more appropriate and descriptive term. While all aspects of soil analysis and management are critical, the twin engines of soil biology and organic matter inputs coupled with the appropriate style and frequency of cultivation drive the system of a biological-ecological approach to soil management.

Although it makes up only 3–5% of the soil, organic matter has a pronounced influence on all soil properties. When added to the soil, it yields:

- A sufficient nutrient supply
- An open, permeable soil surface that allows air/gas

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2011–2012 late Fall/Winter Calendar

Friends of the Farm & Garden's Annual Meeting

Monday, December 5, 6 pm - 8 pm
Farm Center, UCSC Farm

Join us for the Friends of the Farm & Garden's annual meeting and holiday gathering as we review highlights of the past year's activities, look forward to 2012 events and projects, and vote on 2012 Board officers and by-law changes. See the Friends' website, <http://casfs.ucsc.edu/community-outreach/friends-of-the-farm-and-garden>, for nominations and proposed by-law changes.

Please RSVP to 831.459-3240 or casfs@ucsc.edu by Thursday, December 1. *Last name A–L: Please bring a main dish or drink to share; last name M–Z: please bring a salad, side dish, or dessert to share. Bring a flashlight for the walk back to your car.*

“Fruit Trees 101”: Basic Fruit Tree Care

Saturday, January 7, 10 am - 1 pm
Louise Cain Gatehouse, UCSC Farm

Taught by Chadwick Garden manager Orin Martin and Orchard Keepers founder Matthew Sutton, this class will cover the basics of fruit tree care: selection, planting, irrigation, pest management, and basic winter pruning. More detailed pruning classes will be offered on January 28 and February 18 (*see at right*). \$20 for Friends' members, \$30 general public, \$5 for UCSC students, payable at the workshop. Dress for the outdoors and bring a snack. Heavy rain cancels.



Fruit Tree Q&A Session

Saturday, January 14, 10 am - 12 noon
ProBuild Garden Center, 235 River St., Santa Cruz

Bring your questions to this free Q&A session with fruit tree experts from the UCSC Farm & Garden. Learn about varieties that perform well on the Central Coast, along with fruit tree care tips. Note the location: ProBuild Garden Center in Santa Cruz. *Friends' members receive a 10% discount on plant purchases.*

*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
Please note that we cannot accept credit card payments for classes or merchandise (cash or check only).*

Co-sponsored by the Center for Agroecology & Sustainable Food Systems at UC Santa Cruz, and the Friends of the UCSC Farm & Garden.

“Fruit Trees 101”: Basic Fruit Tree Care

*Saturday, January 21, 10 am - 1 pm
Sierra Azul Nursery and Gardens
2660 East Lake Ave. (Hwy 152), Watsonville
across from the Santa Cruz County Fairgrounds
763-0939, www.sierrazul.com

A repeat of the January 7 workshop, this time at the Sierra Azul nursery, located across from the Santa Cruz County Fairgrounds. \$20 for Friends' members, \$30 general public, \$5 for UCSC students, payable at the workshop. Heavy rain cancels. *Friends' members receive a 10% discount on plant purchases.*

Other Fruit Tree Winter Workshops –

In-Depth Winter Pruning, Pome Fruits (Apples, Pears)

Saturday, January 28, 10 am - 1 pm, UCSC Farm
\$20/\$30/\$5 (rainout date = February 4)

In-Depth Winter Pruning, Stone Fruits (Plums, Peaches, Nectarines, etc.)

Saturday, February 18, 10 am - 1 pm, UCSC Farm
\$20/\$30/\$5 (rainout date = February 25)

Fruit Tree Q&A Session

Saturday, February 25, 4 pm - 6 pm
The Garden Co., 2218 Mission St., Santa Cruz – Free

Fruit Tree Grafting, taught in collaboration with the California Rare Fruit Growers

Saturday, March 10, 1 pm - 4 pm, Live Oak Grange
1900 17th Ave., Santa Cruz, 95062
\$20/\$30/\$5; free for members of the CRFG

Also coming up ...

Follow the Fruit Trees through the Seasons:
A Workshop Series on Year-Round Fruit Tree Care
Classes start on February 11. See page 8 for details.

Life Lab On-Line Auction

Life Lab's Online Auction will open Monday, November 7 and close on Sunday November 20, with more than 40 unique items and activities to bid on. Make your holiday shopping a breeze and support great garden education programs. View the auction at www.lifelab.org/auction.

Harvest Festival Draws an Enthusiastic Crowd

If last year's Harvest Festival was the hottest on record, this year's set the mark for rain! Thankfully, the light, warm showers didn't dampen the spirits of the nearly 2,000 campus and community members who joined us for the 17th annual celebration on the UCSC Farm.

Those attending enjoyed lively music by four local bands, tasted more than 25 apple varieties grown at the Farm and the Alan Chadwick Garden, and watched our hard-working pie judges taste the 17 delicious entries in the 10th annual pie baking contest. Also featured: cooking and gardening workshops led by UCSC students from the Food Systems Working Group, a demonstration of coffee quality evaluation ("coffee cupping") by the Community Agroecology Network, herb walks, great food, and of course hay rides and lots of kids' activities. As one satisfied attendee said as they left for home, "That's the best 5 bucks I've ever spent."

Many generous businesses contributed to this year's Harvest Festival—our thanks go to New Leaf Community Markets, Stonyfield Farm, Veritable Vegetable, Jacobs Farm/Del Cabo, Charlie Hong Kong's, Companion Bakers, McEvoy Ranch, and Barry Swenson Builder for their financial support. Other businesses provided generous product and gift certificate donations, including EcoGoods, Farmhouse Culture, and Happy Girl Kitchen. Jim Rider of Rider and Sons once again provided a bin of organic apples for making apple juice. We're grateful to all of them for their support.

Thanks also go to UCSC's Office of Physical Education and Recreation (OPERS), UCSC Dining, College 8, and Media Services. People Power provided free valet bike parking for the event. Many thanks also to all the student and community volunteers who pitched in to help make this annual event a success.

The Harvest Festival is sponsored by the Center for Agroecology & Sustainable Food Systems, the Friends of the UCSC Farm & Garden, and UCSC's Food Systems Working Group, with support from UCSC's Measure 43, the Sustainable Food, Health and Wellness Initiative.*

**Passed in spring 2010 by UCSC undergraduates, Measure 43 generates funds from student fees to support activities and student grants related to food systems and food choices at UCSC. Thanks to Measure 43 funds, UCSC students get free entry to the Harvest Festival.*

Thank You to Our Supporters!

Recent gifts and grants have bolstered our core programs and scholarship funds while allowing us to develop plans for a stronger future financial picture. In July we welcomed an unsolicited gift of \$100,000 from an anonymous supporter interested in funding Apprenticeship staff salaries and second year apprentices. We also were grateful for a July gift of \$1,000 from past Friends' Board member Patricia Lindgren.

In August we received a \$10,000 anonymous donation and a \$1,500 gift from the DreamCatcher Foundation, both for the Apprenticeship. A \$2,000 gift from past apprentice Nancy Saldich joined other gifts in support of expanding fundraising efforts at CASFS and the Farm & Garden to offset cuts to our public funding and to build a strong foundation for future support. We also want to thank Ralph Alpert for his \$1,000 gift through the Spring Fund of the Community Foundation for Santa Cruz County.

In September the Farm-to-Fork Benefit Dinner effort (see page 5) raised more than \$12,000 for scholarships in the 2012 Apprenticeship. For many attendees, the dinner was their first visit to the Farm, bringing a new crop of friends to our fields as well.

October started off with the good news of a \$40,000 grant for the Apprenticeship from an anonymous foundation that has supported the program for over ten years.

We are so grateful for the support from all of our donors, from the major donors thanked here to everyone who has given \$25, \$50, \$100 over the past year. We welcome new gifts, grants, and other support at any time and any level. For information about giving, please see our website at casfs.ucsc.edu/support or call (831) 459-3240.

Apple Pie Contest's Winning Recipe

Of the 17 beautiful pies entered in this year's Tenth Annual Apple Pie Contest at the Fall Harvest Festival, Louise Drummond's entry emerged the winner. She's generously given us permission to share her recipe.

Pie Crust:

2 cups pastry flour plus extra to dust rolling surface
1 cup butter
Water to moisten, iced

Cut butter into flour, mix in enough very cold water for dough to pull together in a ball. Flatten dough on floured surface, fold floured dough together several times. Chill.

Filling:

7 large apples
1 cup sugar
1 teaspoon cinnamon
1/2 teaspoon ground nutmeg
1/4 cup flour
1 teaspoon vanilla
Juice of 1 lemon

Peel, core and slice apples. Mix together dry ingredients, then mix with apples. Add vanilla and lemon juice.

Assembly:

Roll out lower pie crust. Fill with apple mixture. Roll out upper crust and top pie. Trim, seal, and shape edge. Cut vent holes. Sprinkle with one tablespoon each of walnut pieces and sugar. Bake for about one hour at 350°, until nicely browned.

Farm-to-Fork to Future

Apprentices, Supporters Raise Scholarship Funds

What a night we had! On a balmy September Sunday, the 2011 Apprentices planted an important seed with the first annual Farm-to-Fork Dinner benefitting the Apprenticeship Scholarship Fund. If Sunday evening was any measure, this seed will grow, flower, and fruit for many seasons to come.

Early this spring, when the new apprentices learned that the Center for Agroecology & Sustainable Food Systems (CASFS) and the Apprenticeship Program faced unprecedented financial pressures, experienced chef Matthew Raiford suggested a field dinner to raise funds. With two other professional chefs and a caterer in the program, a core group quickly formed. Soon many more apprentices volunteered to help. In June, the Friends of the UCSC Farm & Garden agreed to provide administrative support and advance the costs for producing the event, and the apprentices started planning in earnest. Their goal: raise at least \$10,000 to help keep the Apprenticeship affordable and accessible for future participants who seek the type of high-quality training in organic farming and gardening offered by the program.

In a wonderful confluence of intent and inspiration, Chris Bolling, a member of the UCSC Farm's Community Supported Agriculture (CSA) project, told CASFS staff that he would like to help host a benefit dinner on the Farm as a way of helping bolster its programs amid the recent budget tightening. Chris reached out to many friends and community members to encourage them to learn more about the Center's work and support it by attending the event. Friends' members received an invitation, as the apprentices spread the word in local farmers' markets and businesses, and successfully solicited donations of food, wine, and wonderful silent auction items to add to the event. Then just before the big night, the *Santa Cruz Sentinel* ran a great article about Matthew, the Apprenticeship, and the benefit dinner. The invitation was out there, and the community responded.

Seventy people arrived at the Farm Sunday afternoon and were treated to elderberry spritzers and tomato-strawberry bruschetta as they signed in. Second-year apprentice Ian Wilson and first-year apprentice Israel Dawson then led groups on a tour of the garden and fields, ending at the top of the main field overlooking the bay. There, apprentices had set two long tables of sparkling china and wine glasses, and guests had to make the tough choice: bay view or field view? Chef Raiford then welcomed everyone and introduced each of five remarkable courses as a team of more than 25 apprentices attentively served and cleared. Early clouds bathed the farm in diffuse light, highlighting the colors of the crops and borders, then cleared to reveal blue sky for a lovely sunset as a full moon rose in the east. Throughout the event, several groups of apprentices provided mu-



Weston Monroe

Guests at the Farm-to-Fork dinner enjoy dinner and music in the fields at the UCSC Farm.

sic, from casual guitar, to vocals, to a chamber ensemble to make the experience even richer. With a relaxed pace over the course of the evening, people had time to connect and share in the warmth of the farm and good company.

While everyone was enjoying apple tartin and sweet corn ice cream to end their meal, Matthew announced that we had raised \$10,850 on the night, surpassing our goal! To top it off, an additional \$1,000 donation was pledged before the end of the night, bringing the total to almost \$12,000. It was a remarkable night all around, with many saying it was the best meal they had ever experienced. Perhaps the most beautiful of many elements, though, was one that Matthew pointed out to the assembled group in thanking them for their support: he noted that this year's apprentices and everyone there that night were raising money to help people they didn't know—future apprentices—based on their belief in the value of the program and the importance of it remaining available to all who seek its unique training.

Our thanks go to the many who joined us and the generous businesses that donated food and wine: Fogline Farm, Harley Farm, Companion Bakers, Bonny Doon Vineyard, Frog's Leap Vineyard, Long Meadow Ranch, and Mumm Napa, as well as to the many businesses and individuals that donated silent auction items.

With his culinary experience and deep appreciation for the program, Matthew committed to return for the next four years to help sustain and grow the event in partnership with each new group of apprentices. If you missed out this time, be sure to look for the announcement and respond early next season!

— Don Burgett

Treasurer, Friends of the Farm & Garden

If you'd like to support the Farm-to-Fork scholarship effort with a tax-deductible donation, send a check made payable to the UCSC Foundation to: Amy Bolton, UCSC Farm/CASFS, 1156 High St., Santa Cruz, CA 95064. Please include Farm-to-Fork in the memo line.

A Soil Primer – from page 2

exchange to replenish the soil's oxygen content, and makes it easy for water to enter, percolate through, and drain out of the root zone.

- A “feedstock” to nourish microbes
- A low population of soil-borne plant diseases and pathogens
- A high population of beneficial soil microorganisms
- Good soil consistency, that is, the ability to resist degradation (compaction, erosion, etc.)
- Good tilth, which refers to the “workability” of a soil

And although I'll stop short of calling it a panacea, whatever the problem with soils, the answer is almost always to add organic matter in the form of compost and/or green manures from cover crops:

- On a mono-grained, structureless sandy soil it creates aggregation and aids with moisture and nutrient retention, building the “body” of a soil.
- On a wicked sticky clay it adds more continuous macropores from the surface to the subsoil. This type of pore system reduces puddling, crusting, and erosion of surface soils and allows easy root growth
- It also increases the aerobic (oxygen) content of clay soils, thus facilitating better root growth and a flourishing biological community.

One of organic matter's key properties is that it provides nutrients both for immediate use by microbes and plant roots, and also holds and releases nutrients over time. This is especially true of nitrogen, the most volatile and motile (moveable) of all nutrients, and the one needed by plants in the largest quantity.

On a soil test, the estimated nitrogen release (ENR, given in #s/acre, where >80–100 pounds is good) is a reflection of the amount of organic matter in a soil (3–5% organic matter is considered good for California soils) and its ability, largely through biological activity, to release nitrogen each growing season. Along with a nitrate nitrogen reading (20–40 parts/million is adequate), knowing the percent of organic matter in your soil helps to determine whether you need to add nitrogen as a fertilizer.

Assessing and Amending Your Soil

One good way to assess the overall chemical properties (including nutrient content) of a soil is to get a professional lab soil test. A&L Western Agricultural Labs in Modesto, California (www.al-labs-west.com) is an excellent lab with good customer service, and their test results will give you an accurate baseline as per the macro and micronutrients plus the pH of your soil. A complete analysis plus a nitrate nitrogen test costs \$35—and it's the best \$35 you'll ever spend. Peaceful Valley Farm Supply sells an easy-to-use booklet, *Understanding Your Soil Analysis Report* (\$10), that will help you interpret the results and makes recommendations for addressing deficiencies.

With soil science there is no alchemy, which is to say, if a nutrient is deficient you have to add it. Once added,

it can be managed for both availability and retention. For instance, phosphorus facilitates early root growth, flowering, fruiting, sugar development, and energy transfer within plants. Organic sources include bone meal, oyster shell flour rock, and colloidal rock phosphate.

Once added to the soil, phosphorus is relatively immobile—that is, it doesn't readily leach downward as does nitrogen. But it is quickly “locked up” by both aluminum and calcium in the soil, and thus unavailable for plant growth. As a biological soil manager you can grow phosphorus-concentrating crops such as brassicas, legumes, and cucurbits, then use them for compost or as green manure to work the phosphorus in their plant parts into the organic fraction of the soil, where it will be available to crops.

Another strategy is to add a dusting of colloidal rock phosphate powder to manure layers in a compost pile. Nitrifying bacteria proliferate in manure and they also consume and immobilize the phosphorus, then “give it up” as they die and decompose. Again, it becomes available in the organic matter fraction of the soil when the finished compost is applied.

Closing tips:

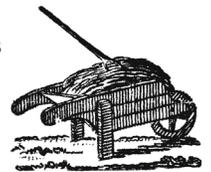
- Dig judiciously and skillfully (see “The Goals of Cultivation” in Resources, below)
- Add organic matter at least once a year as compost or green manures from cover crops
- Don't water excessively, as water leaches nutrients and when applied heavily via overhead or furrow irrigation can damage soil structure and reduce the aerobic (air-holding) capacity of a soil
- Protect the soil surface either with a living mulch, or straw, chips, etc.
- Minimize soil compaction
- Get a lab soil test done and use the results to develop a fertility management plan. Then monitor the soil via periodic tests every 1–3 years to see if your plan is working.
- Above all, develop “an insane reverence for soil” — a soil ethic.

Resources

The Goals of Cultivation, by Orin Martin. News & Notes of the UCSC Farm & Garden, Spring 2007. Available online at: <http://casfs.ucsc.edu/publications> (see the News & Notes link)

The Soul of Soil: A Soil-Building Guide for Master Gardeners and Farmers, by Grace Gershuny. Chelsea Green Publishing, 1999.

Start with the Soil: The Organic Gardener's Guide to Improving Soil for Higher Yields, More Beautiful Flowers, and a Healthy, Easy-Care Garden, by Grace Gershuny. Rodale Press, 1997.





Graduates of the Center for Agroecology & Sustainable Food System's six-month Apprenticeship in Ecological Horticulture program put their training to work in myriad ways. Enjoy these updates on some of the more than 1,300 Apprenticeship alumni who have learned organic farming and gardening skills at the UCSC Farm and Alan Chadwick Garden.

In the News

Apprenticeship grad **Matthew Sutton** (class of 2003) was profiled in the October issue of *Sunset* magazine, which dubs him "The Apple Whisperer." Founder and owner of the Santa Cruz-area backyard food installation and care company Orchard Keepers, Matthew says in the article, "The whole backyard food movement has caused a huge resurgence of heritage apple varieties ... People are moving away from Granny Smith and Fuji, and are looking to grow apples that might not look perfect, but taste absolutely amazing." Learn more about Matthew's work at www.orchardkeepers.com.

Jane Hodge (2010) is the director of the new Farm School New York City program. Profiled in *Edible Manhattan*, Jane runs a program that offers New Yorkers a two-year certificate course and individual classes in professional urban agriculture with an emphasis on practical sustainable farming practices for urbanites, including full farms, rooftop rows and community gardens.

Says Jane, "What's exciting about having students graduate through Farm School is that they are motivated to do more than just grow food; they also want to go and teach other people how to grow food. Our students are very much focused on making sure that the word is getting out there." Read more about Farm School NYC at www.justfood.org/farmschoolnyc. The *Edible Manhattan* article is at www.ediblemanhattan.com/departments/interview/meet-just-foods-jane-hodge-director-of-nycs-first-farm-school/

A recent *Santa Cruz Sentinel* article discusses the rich and varied Community Supported Agriculture (CSA) scene in the Santa Cruz region, created in large part by Apprenticeship alumni's farms and projects. Among the CSAs mentioned: Live Earth Farm (**Tom Broz**, 1995); Freewheelin' Farm (**Amy Courtney**, 1997; **Darryl Wong**, 2004, and **Kirstin Yogg**, 2005); the Homeless Garden

Keep Up with Farm & Garden News!

Keep up with the latest news from CASFS/UCSC Farm & Garden by becoming a Facebook friend. Type Center for Agroecology and Sustainable Food Systems into your Facebook search engine and "Like" our page. And check out the CASFS website for updates, information and resources: <http://casfs.ucsc.edu>.

Another great way to stay current with what's happening at the Farm & Garden is through the *Field Notes* newsletter. *Field Notes* goes out to our Community Supported Agriculture (CSA) members each week from June through October, featuring Farm news and recipes. You can access current and past issues of *Field Notes* on the CASFS website:

<http://casfs.ucsc.edu/community-outreach/produce-sales/community-supported-agriculture>

Also online are back issue of the News & Notes newsletter. Along with other CASFS publications, you can find them at:

<http://casfs.ucsc.edu/publications>

Project (**Forrest Cook**, 1991); and Fogline Farm (**Johnny Wilson**, 2005; **Jeffrey Caspary**, 1999, and **Caleb Barron**, 2007). See the article at www.santacruzsentinel.com/ci_18793361.

Celia Barss (2002) is one of the young Georgia farmers featured in the new film *Grow!*, described as "A documentary film that captures the energy, passion and independence of a fresh crop of young farmers." Learn more about *Grow* at the film's website, www.growmovie.net.

Matt McCue (2006), **Corie Pierce** (2005) and **Adam Wilson** (2004) talked about the challenges and creativity involved in starting and maintaining a farming operation with *Wall Street Journal* reporter Sue Shellenbarger for an article on what it takes to be a new farmer. You can find the article at: online.wsj.com/article/work_and_family.html (use the search function). Corie and Adam own and run Bread and Butter Farm in Shelburne, Vermont, where they grow vegetables, raise cattle, and run a farm bakery (www.breadandbutterfarm.com). Matt founded Shooting Star CSA in Fairfield, California (www.shootingstarcsa.com), and was recently interviewed by fellow Apprenticeship grad Alix Blair for a piece airing on American Public Media (http://thestory.org/archive/The_Story_71311.mp3/view)

If you're in Santa Cruz, check out **Fran Grayson's** (1994) newest venture, The Truck Stop, at 1500 Mission Street. Fran is serving up locally sourced organic meals from a 1976 Chevy catering truck. You can read a profile of the new business and the adjacent Filling Station at www.santacruzsentinel.com/ci_18793689.

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Follow the Fruit Trees: A Workshop Series on Year-Round Fruit Tree Care

February 11-12, May 12, July 14, August 18, September 16, 2012
Alan Chadwick Garden, UC Santa Cruz

Learn how to establish and care for fruit trees in this six-part series designed to “follow the fruit trees” through the seasons. Six hands-on workshops spaced throughout the year will take you from site selection to harvesting and processing as you learn how to optimize your fruit trees’ health and production with proper seasonal care.

Led by Orin Martin, manager of UCSC’s Alan Chadwick Garden, Matthew Sutton, founder and owner of Orchard Keepers, and Zoe Hitchner and Sky DeMuro, graduates of the Farm & Garden Apprenticeship program, course participants will learn how to:

- Select a suitable planting site
- Assess and analyze soil
- Create a plan for planting and care
- Select suitable varieties/rootstocks
- Plant trees
- Prune and train trees (winter and summer)
- Set up irrigation
- Control pests and diseases
- Thin fruit
- Harvest and handle fruit crops
- Process and preserve fruit (canning, juicing, etc.)
- Fertilize and cover crop for fall and winter

Dates: February 11-12, May 12, July 14, August 18, September 16. Classes take place from 10 am – 4 pm at the Alan Chadwick Garden on the UC Santa Cruz campus.

Cost: \$450 for Friends of the UCSC Farm & Garden; \$500 general public. Class size limited to 16.

To enroll in the “Follow the Fruit Trees” workshop series, please send a check made payable to UC Regents to: Amy Bolton, CASFS/UCSC Farm, 1156 High Street, Santa Cruz, CA 95064.

Please include your contact information (email, phone). A \$100 deposit is required to hold your place in the class, with the balance due by January 9, 2012. For more information please contact Amy Bolton at 831.459-3240 or casfs@ucsc.edu.