



News & Notes of the UCSC Farm & Garden

Issue 113, Spring 2007

SPRING PLANT SALE PREVIEW

BLUE TAKES CENTER STAGE AT THIS YEAR'S SPRING PLANT SALE

– SUE TARJAN

The heart of the spring planting season is upon us, so be sure to mark the UCSC Farm & Garden's Spring Plant Sale on your gardening calendar now. The range of varieties available this year pays homage to Alan Chadwick, who founded the original UCSC garden in 1967 and was a major force in building gardeners' appreciation of plant varieties..

The sale will be held on Saturday, May 5 from 10 am to 3 pm, and Sunday, May 6, from 10 am to 2 pm at the Barn Theater, which is near the main entrance to UCSC at the corner of Bay and High Streets. Friends members will be allowed in at 9 am on Saturday and receive a 10 percent discount on purchases with on-site membership signup and renewal available beginning at 8:30 am.

Here's a tantalizing sneak preview of the plants we'll be offering this year, courtesy of Christof Bernau, manager of the hand-worked garden beds at the UCSC Farm. Featured will be twenty or so blue to purple perennials and more than a dozen blue annuals, including herbs, cut flowers, and bedding plants, the foundation for an organic blue collection we'll be building upon over time (something to keep in mind for next year's presidential election season, perhaps). These species all prefer well-drained soil and full sun, although many tolerant partial shade. As an added plus, most are deer resistant!

A common lavender but beloved for its fragrance, 'Provence' is grown commercially in France by the perfume industry and will provide you with armloads of heady blooms. Flowers are a nice mid-shade lavender that dry beautifully for potpourri. One of the best culinary lavenders, it will reach three to four feet in diameter and three feet tall in bloom. Another lavender, 'Silver Frost', has grayish-white foliage and shorter flower stems with shorter, plumper, medium-blue blooms that can provide a striking contrast in the garden.

Parahebe perfoliata, an evergreen perennial from Australia, is a fine addition to our Mediterranean gardens. It's relatively low growing with lavender-blue flowers and blue-gray foliage reminiscent of the type of eucalyptus leaves commonly used in floral displays, and makes an excellent "filler" in flower arrangements.

We'll be offering several different salvias with true-blue to deep-purple flowers. For a dark true-blue flower, choose *S. chamaedryoides*, a low growing spreader. Then there's 'Indigo Spires', a long lived plant that produces excellent cut flowers of a soft indigo or dark lavender-blue. In the blue-purple to purple range, we'll have *S. discolor*, a sage from Peru with white, woolly stems and dark purple, almost black flowers; *S. urica*, with small purple flowers; and the shrubby *S. corrugata* with larger deep purple flowers and interesting foliage—olive green on top of the leaf and brown underneath. A very drought-tolerant bicolor of unknown species, 'Quintessa', has white and lavender flowers set against a woody architecture with a dense canopy of small leaves. And if you're looking for a culinary sage, try *S. officianales* 'Purpurea', with purple tinged foliage and pale lavender flowers. Fry the leaves in olive oil to use as a sprinkle on soups and salads!

Still in the mint family, we'll have *Nepeta faassennii* 'Walker's Low', which will grow to three feet in diameter and around six-eight inches tall. It blooms prodigiously in summer and is irresistible to pollinators. We'll also offer *Origanum hybridum*, an herbaceous perennial with woolly gray foliage and pinkish-lavender, hop-like flowers.

You'll have three different butterfly bushes to choose from. *Buddleia lindleyana* will grow 10-12 feet tall and six-eight feet wide, festooned with slender cascading spikes of lavender-magenta flowers. Then there are two different cultivars of *B. davidii*. Both 'Indigo' and 'Lochinch', with soft lavender-blue very fragrant spikes of blooms and silvery leaves, are adored by hummingbirds, butterflies, and other pollinators.

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And, of course, a Veronica cultivar we've offered for 25 years will be available: *Veronica spicata* 'Chadwick especial'. This plant is endowed with soft green, toothed, waxy foliage and produces tall spikes of lavender-purple flowers that are wonderful in flower arrangements.

We'll also be offering a lavender-blue iris from the Caucasus Mountains, near the Black and Caspian Seas, *I. unguicularis*. This unusual iris blooms during mid-winter in this area; its blossoms coyly nestle on six-inch stems down low amidst two-foot foliage.

Two very true-blue bloomers will also be for sale. *Plumbago auriculata* 'Purple Robe' belies its name with soft sky-blue flowers (just a little lighter than our native baby-blue eyes). This woody six-by-six-foot shrub blooms with abandon throughout the summer. In the same family is *Ceratostigma griffithii*, with green to rusty red foliage on a two-three foot wide to 18-inch tall plant. The mid-to-deep true-blue blossoms are held in rusty red to black calyxes for a stunning impact that lasts all summer and drives insect pollinators wild.

In addition to these blue to purple perennials, we'll offer such annual blues as *Centaurea cyanus* (bachelor's button or cornflower), Cerinthe (honeywort), Nigella (love-in-a-mist), *Salvia farinacea* (mealycup sage), Linum (blue flax), blue and white borage (also known as starflower), Ageratum (whiteweed), Myosotis (a non-invasive species of forget-me-not), and several different cultivars of Lobelia (cardinal flower or Indian pink).

But don't worry! We'll have assorted perennials and annuals that come in colors other than blue, too, including 12 varieties of sunflowers, among them Tithonia, a Mexican sunflower that Monarch butterflies find alluring. We'll also have cosmos, zinnias, statice, snapdragons, stock, Rudbeckia (coneflowers), and Agrostemma (corncockle).

And let's not forget to mention our nice selection of veggies and fruits! For example, we'll have three different strawberry cultivars for your tasting pleasure: 'Albion', 'Chandler', and 'Seascape' along with our petite native variety, which makes a sweet groundcover. We'll also have a substantial selection of raspberries in gallon pots: one floracane, 'Tulameen', and several primocanes, 'Summit', 'Golden Summit', 'Heritage', 'Nova', 'Caroline', and 'Autumn Bliss'. For more details on raspberries, see the 2006 spring issue of the *News & Notes of the UCSC Farm & Garden* at http://casfs.ucsc.edu/publications/news_notes.html.

At least 18 tomato varieties will be available, including a broad assortment of heirlooms, modern slicers, paste and drying types, and cherries. We'll have a dozen or so sweet, mild, and hot peppers—you might want to try the Southwest trio six-pack for a little hit-or-miss spice in your life. In the eggplant realm, we'll be offering an Asian and Italian trio in six-packs grown from Renee's Garden seeds as well as the usual American types.

Other veggie offerings will include cucumbers, summer and winter eating squashes as well as carving pumpkins and gourds, leeks, scallions, Swiss chard, kale, broccoli, cauliflower, cabbage, lettuce, salad mix, and more. Herbs like cilantro, dill, and lots of basil varieties will also be for sale.

Here's a final suggestion before we wrap up. Just to be different and maybe a little daring this year, branch out by growing and then cooking with less familiar produce like tomatillos and Asian greens. Tomatillos grow just like tomatoes and provide a rich, almost meaty taste to salsas and other Southwestern dishes—just peel off the leathery outer skin before you use them. Asian greens like bok choy are easy to grow in our area, simple to prepare, and pack a super-nutritious wallop in slaws, stir-fries, salads, and more. See the summer 2006 issue of the *News & Notes* at http://casfs.ucsc.edu/publications/news_notes.html for more information on Asian greens.

Here's to a superlative spring in the garden!

When you're at the Spring Plant Sale, be sure to check out the Friends of the Farm & Garden booth to pick up a wide assortment of free organic gardening information handouts, along with such delightful merchandise as Orin Martin's Organic Rose Primer, the Friends' cookbook, T-shirts, tote bags, aprons, note cards, coffee cups, and more—all proceeds go to help support the apprenticeship program. Friends' members receive 10% off all merchandise and plant purchases.

Apprentice Wish List

The 40+ apprentices who call the Farm & Garden their temporary home are looking to augment some of their domestic supplies, and are hoping you can help. They are in need of the following –

- Large tupperware or other plasticware containers with tight-fitting lids, in good condition (for food storage and proofing bread).
- New or used potholders in good condition
- New or used towels in good condition

If you're willing to donate any of these items, please contact Amy or Adrea at 831.459-3336 and they'll make arrangements.

Thanks for your support!



Spring/early Summer Calendar of Events

Friends' Apprentice Reception

Friday, April 27, 5:30 pm - 7 pm

UCSC Farm

Join us in welcoming the class of 2007 apprentices to the UCSC Farm & Garden as they begin their six-month training course. Light refreshments will be served. Please RSVP to 459-3240 or jonitann@ucsc.edu.

Farm & Garden Spring Plant Sale

Saturday, May 5, 10 am - 3 pm, and

Sunday, May 6, 10 am - 2 pm

Barn Theatre Parking Lot, UC Santa Cruz

Note: Friends of the UCSC Farm & Garden have pre-entry priority, Saturday, May 5, 9 am - 10 am

Don't miss this chance to enhance your garden with organically grown flower, herb and vegetable starts as well as perennial landscape plants. Friends' members receive 10% off all plant and merchandise purchases. See page 4 for additional details. All proceeds benefit the Apprenticeship Training Program in organic farming and gardening. *Sale takes place rain or shine.*

Strawberry Shortcake Festival

Wednesday, May 23, 4 pm - 6 pm

UCSC Farm

Enjoy fresh organic strawberry shortcake and lemonade as you listen to bluegrass music at the UCSC Farm. Coffee from the Community Agroecology Network (CAN) will also be available. We'll also offer a tour of the Farm. Proceeds from this event help provide limited-income shares in our Community Supported Agriculture (CSA) program. \$5 donation requested. *Rain cancels.*



A Garden of Poetry and Music

Saturday, June 9, 12 noon - 2 pm

Alan Chadwick Garden, UCSC

Join us for one of our favorite springtime events. This year, in honor of the 40th anniversary of Alan Chadwick's arrival at UCSC, we're inviting some of our favorite poets and musicians from past years' gatherings for a special afternoon of words and music in the Chadwick Garden. Enjoy the Garden at its springtime best at this free event. Snacks provided.

Gopher Control Workshop

Saturday, July 14, 10 am - 1 pm

UCSC Farm

Brown mounds got you down? Don't despair. Gopher control expert Thomas Wittman of Gophers Ltd. will offer a number of ideas for dealing with gophers and other vertebrate pests in your yard or garden. \$15 for Friends' members, \$20 for non-members, payable at the workshop. No pre-registration necessary.

Also coming up –

Plant Endemism in the Andes. Thursday, May 3, 4 pm, UCSC Arboretum.

Lou Jost, plant researcher working in Ecuador, will give a free illustrated lecture on the plants in the South American mountain ecosystem that are challenged by development, and how they might be preserved.

Smart Gardening Faire. Saturday, June 23, 9 am-5 pm, Scotts Valley's Skypark, 361 Kings Village Rd.

A free day-long event featuring research-based, up-to-date best practices for sustainable gardening and landscaping. A wide variety of informational presentations and activities are planned. For more information see www.smartgardening.org, call 457-7272, or email info@smartgardening.org.

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

Please note that we cannot accept credit card payments for classes or at the plant sale (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.

FRIENDS' MEMBERS - ARRIVE EARLY AT THE SPRING PLANT SALE FOR BEST SELECTION



Take advantage of your Friends' membership by enjoying early entry to the UCSC Farm & Garden's Spring Plant Sale on Saturday, May 5. Friends' have shopping priority from 9 am to 10 am, with the sale opening to the public from 10 am to 3 pm. On Sunday, May 6, the sale will open to everyone at 10 am. Friends' members also receive a 10% discount on all plant and merchandise purchases. Please remember that we can only accept cash or checks for 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 June '07 or later, your membership will be current for the sale.

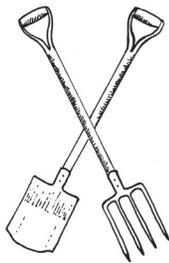
If your membership expires in May '07 or earlier, you can renew it at the sale on Saturday morning starting at 8:30 am, or contact us and we'll send you a membership envelope that you can bring with you or mail in prior to the sale. Call 831.459-3240 or send email to jonitann@ucsc.edu to request a membership envelope, or if you have any questions about the status of your membership. You can also access a membership form at <http://casfs.ucsc.edu/community/friendsform.html>.

Seeking Housing for 40th Anniversary Gathering

The "Back 40" gathering to celebrate the fortieth anniversary of the founding of the Student Garden Project (now the Alan Chadwick Garden) will bring folks from throughout the country and abroad for a 3-day weekend of events, July 27-29, 2007 at UC Santa Cruz.

We're currently looking for housing for those attending the celebration. If you would be willing to provide a space in your home, or camping space in your yard or on your farm, please contact Erin Justus, 40th Anniversary event coordinator, at 831.459-3248, or farmandgarden@gmail.com.

More information about the Back 40 celebration will soon be available — look for a registration brochure and full description of the event in your mail by mid May, or check the CASFS web site at casfs.ucsc.edu, and click on the "Back 40" link under "Announcements" on the home page.



Shares in the 2007 Community Supported Agriculture (CSA) Program Still Available!

Sign up now to guarantee your CSA share

By becoming a member of the UCSC Farm's CSA (Community Supported Agriculture) program, you will receive a season's worth of fresh and local organic produce for a \$600 full share (feeds 4 people) or a \$380 half share (feeds 2-3 people) while establishing a partnership between the local community and apprenticing organic growers. Different payment plans and low-income shares are available.

The season lasts approximately 22 weeks beginning in early June and running through early November. Pick up is once a week, either Tuesday or Friday from 12 - 6 pm, on the UCSC Farm right next to a pick-your-own herb and flower garden that members can utilize on their pick-up day. Members can also look forward to weekly newsletters with recipes, farm updates and events, and complimentary membership to the *Friends of the Farm & Garden* for one year.

If you would like to receive our CSA Brochure and Pledge Form or have any questions regarding the CSA program, please contact Nancy Vail at 831.459-4661 or email navail@ucsc.edu.

Friends Enjoy Annual Meeting and Benefit Concert

A wonderful gathering of Friends' members, apprenticeship grads, and CASFS staff met at The Attic in downtown Santa Cruz to celebrate the year's accomplishments, enjoy great food and music, and do a little business.

On the business side, a new slate of Friends' officers and some by-law changes were approved by the general membership. Jeffrey Caspary will continue to serve as Board president, Jasmine Roohani and Kurt Chistiansen will act as co-VPs, Don Burgett takes over as treasurer, and Michael Irving will serve as secretary. Many thanks to outgoing VP Trish Hildinger, who will continue to serve as a director; and to outgoing treasurer Susan Ford and secretary Sue Tarjan for their enormous contributions.

The meeting closed with a short talk by CASFS acting director Patricia Allen, who expressed her appreciation for the Friends' support, and a presentation by Apprenticeship staff. Alisa Fineman and City Folk then took the stage to entertain a standing-room-only crowd in a benefit concert. Many thanks to the musicians for their generosity!

The Goals of Soil Cultivation

– by Orin Martin

Editor's note: In this follow up to his article on the French Intensive gardening techniques that Alan Chadwick introduced forty years ago (Winter 2007 News & Notes issue), Chadwick Garden manager Orin Martin discusses the goals of soil cultivation.

To cultivate (verb) — from the Latin *colo*,
cult = to till, worship

1. To improve or prepare the soil for raising of crops
2. To grow or tend a plant or crop (hoeing, weeding)
3. To form or refine as by education
4. To cherish, or seek the acquaintance or goodwill of
5. To nourish

All of the above definitions apply in regards to soil cultivation, appreciation and stewardship.

In a “Chadwickian sense” cultivation is a purposefully broader concept than simply digging or tilling the soil. Cultivation is a process toward optimum fertility. It encompasses a broad array of tools, materials and methods. In the French Intensive approach to gardening it usually involves single and/or double digging. Regardless of the scale or style of working the soil you choose, there are some fundamental concepts and goals of which to be cognizant –

Promoting Good Tilth and Structure

The main objective of cultivation is to promote and maintain good tilth. Tilth is a composite term for the overall physical characteristics of a soil (texture, structure, permeability, consistence, drainage, and water-holding capacity). In short, tilth equals the workability of a soil in relationship to its ability to grow plants, as in “this soil has good tilth!” Tilth is also a verb (a very active verb I might add—I tilth, you tilth, he, she, or it tilths). The fork used in breaking up soil clods is a tilthing fork. The act of shattering clods is tilthing.

Regardless of soil textural class (sand, silt, or clay; see discussion, page 7), one of the aims of cultivation is to develop good soil structure, with stable soil aggregates. Primary cultivation (rough digging or plowing) can aid in beginning the process of cementing soil separates together into aggregates. It can be said that limited and timely primary cultivation promotes aggregate formation. It is secondary cultivation, the breaking up of a soil to create a particulate seed bed, that has a destructive effect on soil aggregates.

Almost any action that shifts soil particles back and forth and forces contact will foster aggregation. Other natural forces that aid aggregation include but are not limited to –

- Plant roots, which compress soil particles into small aggregates and break apart large clods. Organic slimy exudates from the fine root hairs cement soil particles together.

- The alternating effects of both wetting and drying and freezing and thawing assist in aggregation.

- Natural cultivators such as gophers, earth worms, sow bugs, millipedes, and centipedes have a mixing and cementing effect on soil separates.

Preventing or Breaking Up Hard Pans

Deep cultivation, such as double digging, can physically fracture or break up impervious soil layers or “pans.” This allows better and deeper aeration, improved drainage and deeper root penetration. The penetrating, fracturing action of both wild and cultivated crops roots can also be a partial antidote to pans.

Pans, be they hard, cow, or plough induced, can occur for various reasons –

- Physical compaction created by animal, foot, or machine traffic (plough pan) can compact both surface and subsoil layers of soil. This is more pronounced on clay and if a soil is worked when wet (>50–75% of field capacity). The weight of a tractor, the number of passes and the speed and type of tines pulled behind play a hand in the compaction imparted to a soil.

Probably the most destructive yet alluring, almost mesmerizing cultivation tool is the rototiller. On the plus side, it renders up a perfect, particulate seed bed. On the negative side, the high number of tines and the rapid speed of rotation, coupled with a constant scraping action at 6–8” deep are destructive of soil structure and rapidly create a hard pan. Rototillers also tend to slice and dice earthworms. The spade and fork, skillfully manipulated, offer minimum compaction but obviously limit the scale of cultivation possible.

- As a result of rainfall and irrigation, the fine particles of clay in a soil leach downward over time (and along with them nutrients, especially nitrogen and potassium). At some point they accumulate, forming an impervious natural clay pan. Soils with high clay content in areas with high annual precipitation are subject to clay pans.

- Clay pans also occur in areas where soil is formed and deposited in layers over time, such as alluvial flood plains and valley bottoms.

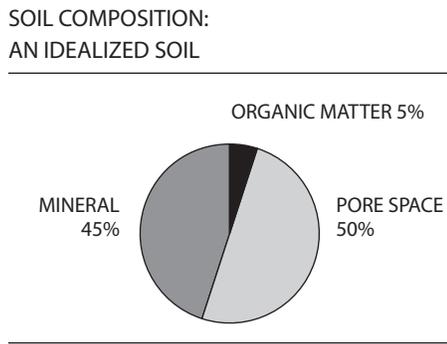
It is important to dig a soil profile (3–5 feet deep) and examine and evaluate a soil before embarking on a cultivation and fertility plan.

Promoting and Maintaining Good Aeration

Cultivation increases pore space, especially macropores. Macropores drain quickly after a rain or irrigation, allowing air to re-enter a soil. In fact the raising of a bed via

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digging is primarily accomplished by adding air to the soil volume (keep in mind that this “loft” is temporary). Aeration is necessary to allow diffusion (a passive process) of atmospheric air into the soil and to allow excess CO₂ to exit the soil. Because of the aerobic respiration of soil microbes and plant roots, soil oxygen is significantly lower and the CO₂ content is higher than that of atmospheric air: soil air can contain up to 100 times the .035% CO₂ and 5–10 times less than the 20% O₂ in the atmosphere. Adequate pore space and a continuous system of pores (from the surface to the subsoil) allow a soil to “breathe.” Constant and excess moisture also limits the re-entry of air into the soil. Keep in mind that all components of soil air are important for plant and microbial growth –



Nitrogen (N) — Soil and root bacteria in association with legumes (peas, beans, clovers, vetches, etc.) can use atmospheric nitrogen gas to produce a combined form of nitrogen (NO₃—Nitrate, or NH₄—Ammonium) that plant roots can assimilate (“free” nitrogen).

Carbon Dioxide (CO₂) — Water dissolves small amounts of CO₂ given off by roots and microbial respiration to form a weak carbonic acid (CO₂ and H₂O). This carbonic acid slowly dissolves minerals so they are more available to plants in solution over time (years).

Oxygen (O₂) — O₂ is often the most overlooked, yet most important constituent of soil air. Adequate oxygen is essential in a soil, as all parts of plants respire/breathe: fruit, seed, stem, leaf and roots. Soil microbes also require oxygen in order to flourish: 80–90% of the beneficial microbes exist in the top 6–8 inches of the soil, where aeration and warmth are optimal. If you can (and you can) extend downward (through cultivation practices) the conditions of the top 6–8 inches, you exponentially increase the area where microbes grow.

Respiration is a process by which carbohydrates made by photosynthesis are converted into energy for work. Just as humans need energy for bodily functions, so do plants and microbes. The better and deeper the soil aeration, the less energy is expended by plant roots to push through the soil to get air, water, and nutrients, which translates to quicker and more vigorous subsequent growth and maturation. Plants’ needs for air, water, and nutrients are best met when the soil has a continuous system of large- and intermediate-size pores from the surface to the subsoil through which water can enter, infiltrate,

percolate, and drain while soil air is constantly being replenished from the atmosphere. This set of circumstances is optimized when proper cultivation practices are coupled with the addition of organic matter to create a granular or crumb structure. Keep in mind, astonishing as it may seem, that roots don’t grow in soil (!) but in the interstitial spaces between soil solids—the pore spaces.

Warming and Drying Soil

A dry soil warms more quickly than a wet one, principally because the amount of energy required to raise the temperature of water 1 °C is much greater than that required to warm soil solids and soil air 1 °C. Additionally on poorly aerated soils, if water can’t drain freely, it takes a large amount of energy to evaporate the moisture via solar radiation. On average, temperate zone soils are 3–6° C warmer in the spring if well drained. Cultivation—along with building and maintaining good structure—warms a soil quickly.

Reactions (biological and chemical) happen faster at higher temperatures. Thus the decomposition of organic matter by microbes, as well as water and nutrient uptake by plants, happen more quickly as soil warms. 50–55° F is a threshold figure above which there is noticeable growth, and below which growth is negligible.

Incorporating Organic Matter

Cultivation is a practical means to incorporate organic matter and fertilizers into a soil at various depths.

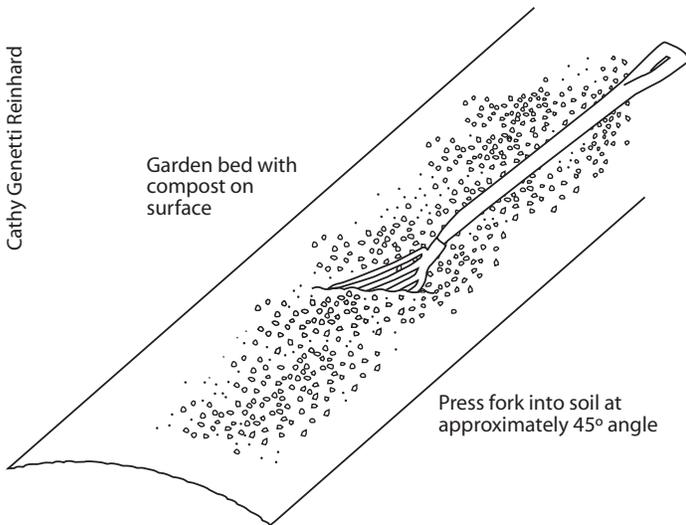
“Organic matter influences physical, biological and chemical properties of soil far out of proportion to the small quantities present (3–5%). It commonly accounts for at least half the cation exchange capacity of soils and is responsible perhaps more than any other single factor for the stability of soil aggregates. Furthermore it supplies energy and body-building constituents for the microorganisms.”

Nyle C. Brady, *The Nature and Properties of Soil*

While all organic matter is originally derived from plant tissues, animals (micro and macro-organisms in the soil) and animal manures (composted alone or with plant material) are a secondary and valuable source of organic matter. The decomposed remains of microorganisms can contribute up to 20% of the total organic matter content of biologically active soils. Green manures, crop residues (roots as well as tops) and weeds, as well as intentional grass/legume cover crops incorporated into soils on a regular basis serve as fundamental building blocks of organic matter and plant nutrition (fertilizer).

Organic matter is a major force in the formation and stabilization of granular or crumb structure of soil aggregates (think of a cross section of a loaf of freshly baked whole wheat bread as a visual analogy). When organic matter is added to a soil via cultivation, the plant residues cement or bind soil particles together as a result of gels,

Cathy Genetti Reinhard



Use a fork to incorporate compost into the top few inches of the soil.

gums, and glues that are byproducts of decomposition. Mycelial strands or webs of fungi also bind soil particles together.

Controlling Weeds

Cultivation (digging) is a practical means to knock down annual weeds and to weaken the crowns, rhizomes, etc. of pernicious perennial weed species. Note: This is a bit of a vicious cycle in that stirring the soil via cultivation also stimulates the germination of weed seeds in the soil bank. In a sense you could say, “Knock ‘em down, stir ‘em up and knock ‘em down again and again . . .”

Creating an Appropriately Well-tilthed Particulate Seed Bed

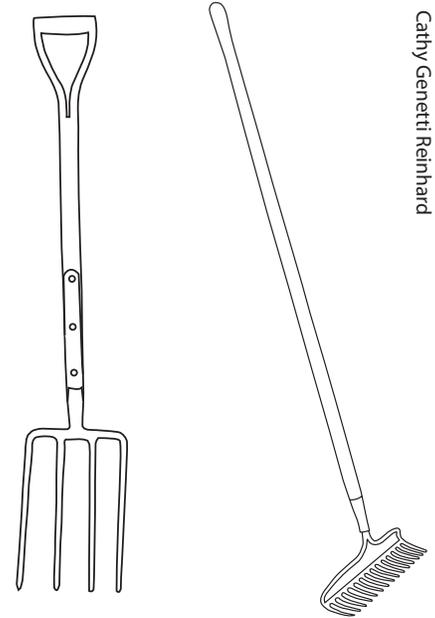
Surface tilth (particle size) should be appropriate to that which is being grown: fine seeds (carrots, poppies, etc.) need a fine seed bed. Bigger seeds (beans, peas, corn, etc.) require moderate tilth. Similarly there are smaller (lettuce, brassicas) and larger (tomatoes, squashes, peppers) transplants with their requisite surface tilth needs. Creating the appropriate surface tilth is achieved by secondary cultivation tools (fork and rake) and techniques (tilthing and raking). Use restraint when creating the seedbed; if done too often and to an extreme degree such actions destroys soil aggregates.

Nutrient Release (in Balance)

Cultivation adds air to the soil. The infusion of oxygen in soil air has a warming effect and promotes a microbial “bloom.” The increased microbial population breaks down or oxidizes organic matter. In this process nutrients are released for uptake and growth by plants. To a limited degree this is a good thing. In excess, it can degrade structure (excessive pulverization), destroy aggregates, reduce pore space, create surface crusting and erosion, and result

in poor water holding capacity and decreased biological life.

A fork and rake can be used to create the appropriate garden bed surface tilth for seeds and transplants.



Cathy Genetti Reinhard

A Word Regarding Texture and Structure, the Two Most Fundamental Physical Properties of Soil

Soil texture is a given. A clay is a clay, a sand a sand. Don’t try to alter it. Live with it—you have to anyhow. Only on a small scale, such as with propagation and potting mixes, can you create a soil with the textural qualities required by mixing proportions of sand, soil, compost, peat, etc.; otherwise it is almost volumetrically impossible to add enough clay to a sandy soil (or vice versa) to alter texture.

An undesirable result of adding clay to sand or sand to clay is that the particles of clay and sand tend to separate and the clay surrounds and seals off the sand. This arrangement of segregated soil particles wreaks havoc with air and water movement and will turn your plant roots bipolar—they penetrate easily through the sandy pockets and slow down considerably in the clay zones.

Unlike texture, soil structure can be managed, improved or degraded. Unfortunately the hard work and results of good practices that take years, even decades, to “come a cropper” can be lost in a few short seasons with poor practices. Things that improve structure (the opposite degrades) –

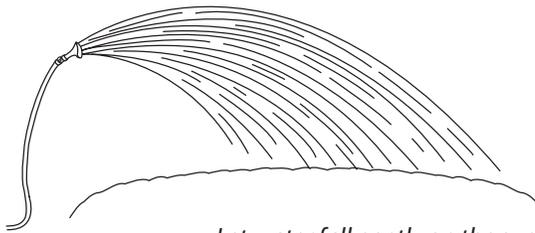
1. Digging at the proper time intervals and soil moisture (50–75% of field capacity).
2. Minimizing compaction (foot, animal and machine traffic). Sandy soils are more forgiving than clay as per 1 and 2.
3. Adding organic matter frequently. Immature green manures serve more as a fertilizer, while mature cover crops (with a higher percent of carbon) improve both the organic matter content and structure of a soil.

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4. Proper irrigation practices. Basically, smaller droplets and lower amounts applied per time are less destructive of structure. A heavy application of water (irrigation or rain) tends to break down aggregates. The individual particles of clay disperse and seal off the surface, resulting in crusting, puddling, runoff, erosion, and the creation of massive structure, i.e., clods.

5. The binding, cementing effects of plant roots and microbial exudates.

6. No bare soil—either a living or dead mulch to protect surface structure. For every time water doubles its velocity it squares its erosive potential. Mulching softens and slows the speed of water.



Let water fall gently on the surface of the garden bed to protect soil structure.

Vocabulary Terms

Aggregates (Aggregation): Many soil particles bound together in a single mass or cluster.

Cation Exchange Capacity (CEC): The capacity of a soil for ion exchange of positively charged ions between the soil and the soil solution. A positively-charged ion, which has fewer electrons than protons, is known as a cation due to its attraction to cathodes. Cation exchange capacity is used as a measure of fertility, nutrient retention capacity, and the capacity to protect groundwater from cation contamination.

Consistency: Ability of a soil (stable aggregates) to resist the pressure of crushing and its ability to be molded or shaped. Descriptive terms for consistency include loose, friable, loamy, plastic, sticky, etc.

Infiltration (infiltrate): Downward movement of water into and through a soil; the rate at which water moves in a soil.

Particle size: Diameter of a single unit (separates) of soil.

Permeability: Ease with which liquids, gases or plant roots can penetrate or pass through a soil.

Soil Separates: Individual particles of soil composed of either sand, silt or clay.

Structure: Refers to the grouping or binding together of soil particles (sand, silt, clay) into aggregates. Preferred types of structure = granular – nonporous; crumb – more porous.

Texture: Term referring to the relative proportions (%) of the three sizes of soil particles—sand > .05 mm in diameter, silt = .05–.002 mm, clay < .002 mm—present in a soil, as in a sandy soil, a clay soil, etc.



Meet the 2007 Apprentices

Here's a brief introduction to the new group of apprentices who joined us on April 16 from across the U.S. as well as China, Mexico, and Zimbabwe to begin the 6-month training course in organic farming and gardening at the UCSC Farm & Garden. This year's class includes one of our youngest (18) and our oldest (69) participants, with particularly strong representation from the southern U.S.

Your membership in the *Friends of the UCSC Farm & Garden* helps support this internationally known training program by providing funds for scholarships, teaching staff, equipment, and facility improvements. See page 3 for information on the Friends' reception; we hope you'll join us to welcome the 2007 apprentice class.

Lanette Anderson: I was born and raised in Southern California. I attended UC Berkeley where I studied environmental science and where I had my first agricultural experience working in the school's student garden. After graduating, I traveled throughout Spain and France, working and living on organic farms through the WWOOF organization. In the future, I would like to teach horticulture, either at the colligate level or high school and also be involved in school gardens.

Linn Aosjia: Raised farming prairie soil in Canada. After a fun, far-flung fall from Apple Tree (film/video career), returned for degree at New College California in EcoDwelling: Sustainable Integrated Systems Design, 2001. Permaculture certification followed. Four years in Latin America: designing Gardenscapes; reforesting pastureland; teaching tropical organic gardening, and with husband, natural building; educating to improve local women's economic opportunities; appreciating volunteers on our farm "EcoLoco." Future: Tropical Organic Agriculture Extension Program!

Caleb Barron: I grew up in Minneapolis, MN among a family of gardeners and worked in a nursery a few summers ago. I have focused my life on the outdoors by choosing a major in geology and spending many summers camping and hiking. As a result, leading a life balanced and in harmony with the natural world became very important to me. I plan on traveling internationally to work with small villages in farming more sustainably

and continuing my education and experience with permaculture.

Guillermo Bayley: Born in Uruguay a long time ago. Lived most of my life in the countryside. I have been working with ornamentals for a number of years now, and would like to learn about the “edible” field. Thanks to the opportunity that I have today, am planning on spending the future between my two homes, Pescadero, CA and a little place down south on the Atlantic ocean, growing things the right way and teaching other people about it.

Rebecca Bozzelli: San Francisco has been my home for the past 6 years. For the last five years, I managed a community garden and taught garden education and science at an elementary school in San Francisco. I wish to return to the world of farm education, hopefully with middle and high school youth.

Noah Bresler: I was born in Massachusetts and raised in the San Francisco Bay Area. I went to UC Berkeley and studied capitalism and global inequality. Not until this past fall did I develop a serious interest in agriculture. My increasing interest is motivated by a belief that the problems of our agricultural system are representative of the problems our society faces, and by a feeling that this is one of the best places to start exploring social change.

Ashley Brister: I was raised in Cohasset, Massachusetts, a small coastal community south of Boston. My first farming experience was as an apprentice at Seeds of Solidarity Farm and Education Center in Orange, MA. More recently I have helping manage and do research for Coonamessett Farm on Cape Cod. My future plans include earning a masters degree in environmental education and expanding the educational opportunities offered at Coonamessett Farm.

Jetson Brown: Growing up, I had a large garden on my parent’s property in Florida and enjoyed the physical act of gardening. When I was eighteen I moved to San Francisco, where I became greatly interested in the political aspects of sustainable agriculture. My goal for the future is to create a working/teaching organic farm on the East Coast that will impact my community.

James C. Burtle: I was born in Detroit, MI and have lived in several regions of the United States. My desire to practice sustainable agriculture develops as an extension of my study in meditation and martial art. My perspective on food systems draws from more than a decade of diverse experience in the food service industry. My future plans include sharing sustainable farming practice with meditative communities in the United States.

Megan Capp: I was born in Ashland, Oregon and raised there and in Brookings, a small town on the Oregon coast. I graduated from the University of Oregon last summer with a general science degree. I am currently

serving 300 hours as an Americorps Volunteer at a community garden run by FOOD For Lane County, a non-profit organization. My future goals include learning how to successfully operate an organic farm while practicing sustainable agriculture.

Ben Carder: I was raised in Grand Junction, Colorado. I now reside in Point Reyes at the Permaculture Institute of Northern California. My first farming experience came in 2005. I’ve completed courses in earth activism, permaculture design and nature awareness. My plans for the future are to work hard, get dirty, have fun, eat well and live simply. I hope to finance this escapade through farming in Point Reyes, Petaluma (CA), Colorado or perhaps Nepal. Namaste!

Sallie Constant: I grew up in the Puget Sound area of Washington State. I have worked with plants for many years in nurseries, yards, gardens and farms. Currently I live and work at Aprovecho, a community and education / research center for organic gardening, appropriate technology and forestry in Cottage Grove, Oregon. My goals are to use gardening and farming as a tool to connect communities, create autonomy, good health and beauty.

David Cooper: I have lived in eight states and in Mexico; I currently reside in Knoxville, Tennessee, where I’m an environmental scientist. Every year for the past six years I have planted and maintained my own organic vegetable garden, and I was actively involved with my neighborhood community garden this past summer. Upon completion of the Apprenticeship program, I want to work for an organization or educational institution, teaching youth to grow their own food.

Katherine Davis: I was raised in Birmingham, Alabama. During college, visiting and working on a friend’s garden inspired me to learn more about raising food. Since then, I have spent several months living and working on small-scale family-run organic farms as I traveled in Turkey; and dedicated time to bio-remediation projects in New Orleans. Eventually, I hope to learn enough to feed myself and teach other people.

Nancy Dockter: I grew up in Jacksonville, Florida. For 20+ years, I have lived in Arkansas. My gardening experience includes backyard and community gardening and as an intern and volunteer at a school garden project in Little Rock. For the last four years, I have been a student and employee at Arkansas’ College of Public Health. I plan to apply what I learn to help others produce food and live more sustainably.

Marie Douglas: Of African and American Indian ancestry, I was raised in rural Louisiana and Pennsylvania. I grew up climbing trees, catching crayfish, camping, and loving the natural world. During 30 years of adulthood, I’ve worked on an organic food crop farm, studied

continued on next page

permaculture basics and medicinal herbology, taught kids English for two years, and traveled in Mexico, Canada, and Guatemala. Plan to create a garden-curriculum school and work with land-based communities. Love horses!

Rebekah Guss: I developed a passion for organic food and farming while working in a community garden at Brown University. I've since worked as an environmental educator, lived off the grid, volunteered on organic farms, and tended various gardens. Wherever I have been and whatever I've been doing, however, the urge to have an organic farm/CSA has remained constant. I am excited to finally pursue this dream.

Joshua Hardin: I was born in Grady, Arkansas, and raised in the rich tradition of family and farming. I have also worked with many other small local farmers in creating a network of natural and local farms. Much of my experience has been in marketing but I have always been a part of planting and harvesting as well. I hope one day to bring our commercial farm to a new frontier of beneficial farming.

Willow Hein: I was raised in Nevada City, California. My first farm experience was two summers ago when I worked as an intern on a small organic farm in the Nevada City area. Last summer I worked at a unique restaurant in Boulder, Utah that attempts to grow all its own produce and use local food. My future plans are to live as much as possible in a self-sustaining farming environment.

Eleanor Hilmer: Raised in California, I have lived in Santa Cruz for the past 5 years. I completed my undergraduate degree in the Agroecology program at UCSC in June 2006. My agricultural experiences include farm internships and volunteer work, teaching children in the Life-Lab garden classroom, and spending time in my lovely back-yard garden. I'm currently working at a local nursery. Following the apprenticeship I plan to start a CSA with my partner in Sonoma County, CA.

Lu Jing (Cody): I'm from Beijing, China. I graduated from China Agricultural University. People in China pay more and more attention to nutrition and safety of food. Organic food will have a good future in China. But now, most people don't know what exactly is organic food and how to plant it. My future plan is to apply the practical skills and experience studied from this program in my home country.

Kelsey Keener: I have lived almost my entire life in East Tennessee. My family bought a run down farm about ten years ago and we began a small, sustainable operation. We have worked extensively to help awaken the over used soil as well as awaken our local community's awareness of healthy living. I plan on bringing back what I have learned in the apprenticeship program and helping the cultural revolution in my area.

Jeannine Laverty: I grew up on a farm in Iowa before agribusiness struck. I fled for college and made my living as a teacher, copy editor, and storyteller. Last summer, I worked full time on the New York organic vegetable farm where I have been a CSA member for more than 20 years. I hope to find some way with my combined life experience to improve the dismal food production system the US promotes.

Herb Machleder: Until recently I've been a University Professor, and then I discovered the soil. In early 2006, after completing the training program, I became certified as a Master Gardener of the University of California Cooperative Extension. Since then I've worked with children and teachers to establish school gardens in Los Angeles County. My hope is to continue this direction and help spread the urban garden program with a foundation based on the CASFS approach.

Robert Marosi Bustamante: I was raised in the (San Francisco) South Bay in a Hungarian Jewish (father) Nicaraguan Catholic (mother) household speaking Spanish. This past decade, I've been a bilingual schoolteacher, a head gardener, political organizer and most recently an artist on sabbatical. I've been able to link science, nutrition and art in developing garden based programs for urban youth, with an ultimate aim of starting my own progressive school.

Deena Miller: I am originally from the Sierras (CA) and was inspired by the concept of sustainable living through a field quarter my freshman year of college. Hence becoming a community studies major with a focus in sustainable agriculture and social change. I did my field study with the Homeless Garden Project where I managed a kitchen garden and co-managed the CSA. My future plans include a permaculture/educational site and working with prison gardens.

Joy Moore: Originally from Harlem NY, I transplanted to Berkeley, CA in 1969. I will improve the health of my community by promoting the virtues of organic produce. My farming experience was as a young girl on my family's farm in North Carolina. I learned to pick and tie tobacco at 13. I've always loved growing. I will bring my skills back to Berkeley, be a teacher and spread love and good health through my community.

Chad Morse: I've spent all but a few of my 28 years in the San Francisco Bay Area. I have been working in education for five years, the last three running service-learning programs for university students. While I am by no means a seasoned farmer (yet!), in the future I would like to focus on experiential education through agriculture.

Steven Munno: Raised in Great Neck, NY, and have been living in California's Sierras for the last 3 years. Having been the beneficiary of CSA programs for many years, I wanted to help and learn as much as I could. I began

volunteering for a farmer/CSA coordinator. Eventually, I put together my own garden. I'm interested in the connections between food, public health and resource management, and hope to work in that capacity.

Masauso Mwale: I am a Zambian Citizen. I completed a two-year course in general agriculture before doing a diploma training in Human Resource Management followed by agriculture related short courses. I once worked for a Diocese Farm for the Catholics as a Farm Manager, then as a Project Organizer for the Lutheran World Federation. Currently, I am an Extension Officer for the Government of Zambia. Looking forward to establishing Farmer Field Schools in vegetable production

Dan Phelps: I was raised in Novato, CA (North Bay). I became exposed to agriculture through my Aunt's farm (Petaluma, CA). In March, I'm graduating from UCSC with a degree in Community Studies, focusing on social justice in agriculture. I recently spent six months in Bayview Hunter's Point (San Francisco), assisting in starting up and running a farmers' market, bringing fresh produce to an inner-city neighborhood devoid of such. I also worked at a community garden there.

Ryan Power: A recent UCSC graduate in environmental studies, I am excited to learn with my hands in unison with my brain. My interests include extreme gardening, tree climbing, music playing, bird watching, and the ocean. I am very excited to sleep under the cypresses and stars.

Marai Rodoreda Rossell: I'm from Mexico. I'm 30 years old. I took the Summer Course in Sustainable Agriculture at UC Davis in 2002. The following year, I started a crops garden at a primary school and tended it along with the kids for a year. My main interest is to develop urban community gardens both for children and for adults in Mexico.

Stephanie Rosenbaum: Born in New Jersey, I spent 12 years as a food writer in San Francisco, writing extensively about local farmers, ranchers, and artisanal food producers. I've been an active community gardener in both San Francisco and New York City, as well a volunteer at Added Value, an urban farm in my Brooklyn neighborhood. I've also given cooking demonstrations promoting the use of local and seasonal products at farmers' markets across the country.

Anne Sheridan: I was raised in Wisconsin and am currently living in Flagstaff, AZ working for a native plant nursery and environmental education center. My interest in sustainable agriculture has led me to work on farms in Alaska and Hawaii and also to become a "Master Gardener" in the High Country. Happiest when growing plants and contributing to the building of healthy communities, my future plans involve starting a small farm and education center.

Trevor Tyler: I was born and raised in Los Altos, CA. My first interaction with dirt and plants was in my elementary school days, where I helped grow vegetables with my dad on a small plot, outside of our house. I truly didn't get into farming until two Falls ago, at the Cal Poly Organic Farm. My future plans are to further my understanding of agriculture practices and to give it back to the world.

Leon Vehaba: I was born and raised in Brewster, NY, but spent ten years in Massachusetts attending undergraduate and graduate school. My first farming experience was two years ago when I apprenticed with a Fijian elder. In addition to learning traditional farming practices he taught me herbal medicine and traditional living skills. My future plans are to develop a farm and education center that educates children and adults about sustainable food systems and living skills.

Jeff Wylie: I grew up farming in Texas with Colorado as my second home. Working with plants has been part of my life for as long as I can remember. Upon studying horticulture and irrigation at Texas State, the necessity for sustainable agriculture became palpable. The despair of standard farming and the accompanying subsidies have inspired me to look for alternate agricultural practices. I desire to propagate the organic agricultural trend throughout Texas.

Alumni Updates

Apprentices have put their training to work in myriad ways worldwide—as farmers, gardeners, educators, policy makers, chefs, and leaders in the organic food industry. As part of our 40th Anniversary celebration we've been compiling short profiles of apprentices and their current work, along with photos. You can see the pictures that accompany these brief profiles on our web site, <http://casf.ucsc.edu/back40/profiles.html>. Here we focus on some of the earliest apprentices, many of whom worked with Alan Chadwick and his immediate successors –

1960s – 1970s graduates

Beth Benjamin (1967-68) helped found Camp Joy in Boulder Creek, California, and is currently the Camp Joy board president. She was also co-founder of Renee's Garden Seeds in Felton, California.

Mark Cain (1978) owns Dripping Springs Gardens in the Ozark Mountains of northwest Arkansas, where he farms vegetables and flowers for farmers' markets and other outlets.

Steve Decater (1966-67), his wife Gloria and their family and apprentices run Live Power Community Farm in Covelo, California, using animal power to produce vegetables and fruits for a 180-member CSA, the oldest

continuously operating Community Supported Agriculture program in California. In a unique arrangement, their CSA members helped raise the funds to acquire a permanent agricultural easement on the land. For more information, see www.equitytrust.org/GainingGrnd06.htm.

David Griffiths (1976) started Seven Stars Farm in Phoenixville, Pennsylvania, a 350-acre certified organic and Biodynamic dairy farm located in northern Chester County. According to their web site, "We use the milk from our Jersey and Jersey crossed herd to produce Seven Stars Organic Yogurt. Our yogurt is sold via natural foods distributors throughout the eastern United States." For details, see www.sevenstarsfarm.com.

Dr. Oran Hesterman (1971) is the inaugural president and chief executive officer of the Fair Food Foundation. He will begin this role full-time starting January 2008. Until then, he will continue to provide primary leadership to the W.K. Kellogg Foundation's Food and Society Initiative as program director, in addition to focusing on food systems and rural development policy. For more on the Fair Food Foundation, see www.fairfoodfoundation.org.

Orin Martin (1974-1975) will celebrate his 30th year as manager of UCSC's Alan Chadwick Garden in 2007.

During those years he's been instrumental in teaching thousands of apprentices, UCSC students, and members of the public the skills of organic horticulture through the apprenticeship training course, as an internship coordinator for UCSC undergraduates, as a popular lecturer in community outreach programs, and through his writing for this and other publications.

Ayn Perry (1971) is a soil conservationist with the Natural Resources Conservation Service in Yreka, California.

Dennis Tamura (1968, staff) runs Blue Heron Farms in Corralitos, California, one of the longest-running and most successful organic farms on the Central Coast. http://www.diamondorganics.com/blue_heron

Jim Nelson (1967-68) co-founded Camp Joy Gardens in Boulder Creek, California, a small, organic family farm that is run as an educational non-profit organization. "Since 1971 we have been teaching ourselves and others how to live more sustainable lives through gardening, animal husbandry, food preservation, and other skills of simple living. The fruits of our labor are sold to people in the Santa Cruz Mountains through our CSA." For more information, see www.campjoygardens.org.

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