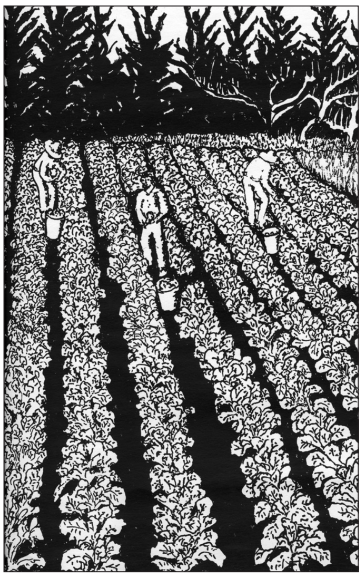

Forrest Cook

News & Notes of the UCSC Farm & Garden

Issue 112, Winter 2007

French Intensive Gardening: A Retrospective

– Orin Martin

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

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

History of the French Intensive System

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

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

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

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

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

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Alan Chadwick began the Student Garden at UCSC in 1967.

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

Building Soil with the French Intensive System

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

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

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

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

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

Primary Features of the French Intensive System

Permanent Beds

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

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

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

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late Winter/early Spring Calendar

Bread Baking Workshop

Saturday, March 17, 4 pm - 6 pm

Learn the basics of baking great bread from the Companion Bakers team in this hands-on workshop. $15 for Friends members; $20 for non-members. Please pre-register for this event and get location information by Monday, March 12, by calling 831.459-3240, or by email to jonitann@ucsc.edu.

Annual Meeting and Benefit Concert by City Folk, with special guest Alisa Fineman

Wednesday, March 28
Annual Meeting: 5:30 - 7:30 pm Concert: 8 pm
The Attic, 931 Pacific Ave., Santa Cruz

Join us for a special Friends' annual meeting as we mark the 40th anniversary of the Garden's founding and look ahead to the next four decades. Enjoy a slideshow, free hors d'oeuvres and dessert (dinner and drinks available for purchase). Stay to enjoy wonderful music by City Folk, with special guest Alisa Fineman. Concert tickets ($15) available from www.theatticsantacruz.com/events.php, or call 459-3248 for more information. Please rsvp for the free annual meeting by Thursday, March 22nd to jonitann@ucsc.edu, or call 459-3240.

Organic Rose Selection and Care

Saturday, March 31, 10 am - 12 noon
The Garden Company, 2218 Mission St., Santa Cruz

Chadwick Garden manager Orin Martin presents a free workshop on choosing and raising roses, and controlling pests and diseases using organic techniques. This is a great time of year to select and plant container-grown roses when you can see them in bud. Note the location: The Garden Center on Mission Street.

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
(corner of Bay & High Streets, Santa Cruz)

Friends of the Farm & Garden members will have pre-entry priority from 9 am – 10 am on Saturday.

Come choose from a wonderful selection of organically grown flower, herb and vegetable starts, perennials, grasses, and other landscape plants, specially chosen for Central Coast gardens. Proceeds support the Farm & Garden Apprenticeship training program. Friends' members receive a 10% discount on purchases. *Memberships and renewals are available the morning of the sale, beginning at 8:30 am on Saturday and 10 am on Sunday.*

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

Also coming up ...

The San Francisco Flower & Garden Show

Wednesday through Sunday, March 21 – 25
Cow Palace, South San Francisco

See six acres of fabulous gardens and attend a variety of gardening workshops and seminars. Check out the great lineup of workshops and purchase tickets at www.gardenshow.com or call 800.569-2832.

The Central Coast Home & Garden Show

Saturday and Sunday, March 21 – April 1, 10 am - 6 pm
Cocoanut Grove, Santa Cruz

Come see the latest home and garden ideas and demonstrations, as well as home improvement ideas at this springtime show. Come visit the Friends of the Farm & Garden booth while you're there. Call 831.423-2053 for more information.

Nominees for Friends' Board Officers

Please note that the following have been nominated for Friends of the Farm & Garden Board officer positions. The slate of officer nominees will be presented for approval of the general membership at the Friends' Annual Meeting on March 28 (see above). The nominees are –

President: Jeffrey Caspary
Vice-Presidents: Kurt Christiansen and Jasmine Roohani (co-VPs)
Treasurer: Don Burgett
Secretary: Michael Irving

Grants and Gifts Support New Greenhouse, CSA Training, Outreach Projects, and Scholarship Work

The Apprenticeship has received two grants totaling $120,000 from Newman's Own Organics through the Newman's Own Foundation, the largest grant award ever made to the Center's organic training program. One Newman's grant of $60,000 will help fund the new greenhouse facilities at the UCSC Farm and an earlier grant of $60,000 is already funding Apprenticeship staff salaries this year. Newman's Own Organics sells certified organic products and produce and donates its after-tax profits to charities.

Gaia Fund awarded a $30,000 grant for the greenhouse project, Gaia's largest grant to the Center to date. The Stanley Smith Horticultural Trust also awarded $10,000 for greenhouse construction. The new greenhouses will serve as organic production and teaching sites, and will also demonstrate appropriate technology use on the farm such as solar electricity and recycling of irrigation water.

A $30,000 grant from an anonymous foundation will also help support Apprenticeship staff and second-year apprentice salaries in 2006–2007, along with outreach to let other educators know about our instructional materials.

A True North Foundation grant of $30,000 will support two connected projects of the Apprenticeship, the Farm-to-College Sustainable Food Project and the Community Supported (CSA) Education and Training Project. The Farm-to-College project links the UCSC Farm with other local organic farms to bring organic produce to the campus dining halls, and bring UCSC students to the Farm & Garden to harvest campus crops and learn about sustainable agriculture.

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

We'd also like to acknowledge the generous contributions of apprenticeship alumni and Friends' members in response to our annual end-of-the-year fundraising appeals. Many thanks also to former apprentices Daniel Paduano for designing the apprenticeship newsletter that accompanied the alumni appeal, and Ross Newport of Santa Cruz Community Printers for arranging the printing donation.

Sign Up Now for the 2007 Community Supported Agriculture Season!

Sign up now to guarantee your CSA share

By becoming a shareholder in the Farm & Garden Community Supported Agriculture (CSA) project, you'll receive a box of fresh-picked, organically grown produce each week while supporting the Apprenticeship training program and establishing a partnership between the local community and apprenticing organic growers.

Shares cost $600 for a full share (feeds 4 people) or $380 for a half share (feeds 2–3 people). Payment can be in full or divided up into two or four installments. There are also shares available for low-income households at half the cost of a regular share. Pickups on the UCSC Farm start in early June (weather permitting) and run through October or into early November.

Members can also look forward to weekly newsletters with recipes, farm updates, and events; complimentary membership to the *Friends of the Farm & Garden* for one year; a 10% discount on plants and merchandise at our bi-annual plant sales; and quarterly issues of the *News & Notes*.

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.

Eco-Farm Conference Helps Mark 40th Anniversary

An overflow crowd gathered in the vast Merrill Hall on Friday morning of the Ecological Farm Conference in Asilomar, California, this January to hear the "Successful Farmers" plenary session, which this year included the Apprenticeship as one of its features. Apprenticeship staff members gave a brief background and history of the UCSC Farm & Garden, CASFS, and the training course (see next page), then profiled 10 graduates who've gone on to successful careers in farming and education.

The night before the plenary, many apprenticeship grads, CASFS staff members, and other Farm & Garden friends and supporters gathered for a "Back 40" kickoff mixer to mark the start of the 2007 year-long 40th anniversary celebration. Many thanks to The Rolling Cultivators for providing music for the event; to Gary Crandall for desiging the "Back 40" logo; and to Becky Lynch Janssen for the photo that was used on the save-the-date postcard that you recently received.

Chadwick's Favorite Roses

-by Sue Tarjan

One nippy afternoon during our January 2007 cold snap, I visited Camp Joy, a small organic farm established in 1971 in Boulder Creek, to interview one of its originators, Jim Nelson, about some of Chadwick Garden founder Alan Chadwick's favorite roses—and his own. Jim, who worked with Alan at the UCSC garden during the late 1960s, kindly gave me a tour of Camp Joy's roses and shared a few memories of Alan along with some rose gardening tips.

Most roses would like the winter chill they'd be sure to experience nestled in this valley in the Santa Cruz mountains. At Camp Joy, the big arbors graced with climbing roses are important design features that provide shady spaces for tea and talk, but other varieties are grown throughout the property to be enjoyed for their beauty and fragrance and to be utilized along with the climbers for special occasion bouquets: hybrid teas, for example, are planted as borders to provide repeat blooms for cut flowers.

In addition, Jim makes jam from the large, showy rose hips of *R. sweginzowii macrocarpa*, introduced to him by the late Louis Saso, whose Saratoga garden had one of the largest collections of herbs in California. This is a large, vigorous shrub "species" or wild rose with large, flattened thorns that flowers once in summer—fragrant, deep pink single blooms—followed by long, scarlet hips extremely rich in Vitamin C. Tolerant of shade and poorer soils, it does well in our mountains.

Jim told me that he and Alan shared a special fondness for the big old climbers and old fashioned shrubs, with their strong scents and "wild and unruly" growth habits. Singled out for praise were the climbers 'Buff Beauty' that "performs so well" at Camp Joy, one of Alan's particular favorites, 'Madame Alfred Carrière', and the *R. moschata* (musk rose) that bloomed so spectacularly at last year's May plant sale that it left visitors agog! By the way, this event is on Mother's Day weekend and offers veggie and annual and perennial cut flower starts for sale.

Jim told me that some say not to prune large climbers, but he finds that the plants gets overly bushy over time so that branches underneath get shaded out, so he prunes twice a year. In winter, he takes out dead wood and weak branches to "tidy up" but avoids drastic pruning that might inhibit the next season's blooming. In summer, he's a bit more ruthless. He gave me a quick tutorial in rose pruning, explaining that if shortened or headed, a rose will become more complex, so thin first to get rid of redundancy and free up space, and remember not to shorten climbing roses too much.

Jim recalled that Alan loved old roses like the Damask rose 'Bifera' popular in Virgil's time and the climbing and cabbage roses so sumptuously depicted in old paintings. Following are some of the roses Alan most esteemed.

Among the climbing roses, he was perhaps most fond of 'Madame Alfred Carrière', classified as a Noisette type, an old fashioned rose suitable for beginning gardeners. It likes full sun but tolerates some shade and isn't fussy about soil—very hardy and disease resistant and grows to 20 feet or more with nearly thornless canes, making it very easy to train. It has powerfully fragrant, creamy white with a pink blush, double flowers that Jim told me are wonderful for wedding bouquets.

If you yearn to nestle a garden seat under a trellis of overhanging roses, this would be your choice because the blossoms tend to bend down on thin, flexible stems. Not only did Britain's Royal Horticultural Society recognize its excellence with the Award of Garden Merit in 1993, but it was the only rose in Camp Joy that bore a bloom when I was there despite several freezing nights—and not just one but several blooms with a discernibly dreamy scent—with some lovely buds to boot!

Jim reminisced regretfully about a monster Mme. Alfred that had once towered near a clump of redwoods at the west end of the Chadwick garden—ill advisedly chain sawed to the ground some time after Chadwick left—not a productive pruning strategy, according to Jim, as it never really came back. Camp Joy's Mme. Alfred suffered a fortunately less terminal near catastrophe two years ago during a wind storm that left only one-third of the plant standing (I saw two sawed off four-inch diameter stumps remaining that hinted at its former glory). Fortunately, there was enough healthy growth left to support new roots, and it's thriving now. Jim noted proudly that it's always the first and last to bloom at Camp Joy—most profuse around April but a repeat bloomer throughout the growing season. Then it defoliates and "looks awful" around the beginning of June, the sign that it's time for its second pruning of the year.

Another favorite growing at Camp Joy is 'Buff Beauty', a gorgeous hybrid musk climbing rose that blooms repeatedly throughout the growing season and has clusters of up to 12 large flowers with very double petals and a knockout fragrance; it's a vigorous grower with large, medium-green, semi-glossy foliage. I admired Camp Joy's Beauty fes-

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tooned over a gazebo where Jim had broken out some of the lathes to provide himself with enough access to keep it thinned properly.

Then there's 'Cl. Cécile Brunner', a Polyantha with classically shaped small pink buds that give it its popular name, "sweetheart rose." It's long lived, healthy, and tolerant of poor soils and shade. According to Berkeley Horticultural Nursery, it's "been known to rip the front porches off houses with its large mass." Jim told me that it was the least pruned of all the roses on the property until its arbor broke during our recent fierce winds. I can attest to the truth of that statement, judging by the impressive pile of freshly pruned canes I saw heaped alongside it.

But the rose I found most striking in the dormant wintry scene was *R. moschata* , the musk rose with curved or climbing branches that support loose clusters of "teeny, white, fragrant, spicy, polleny flowers." The rose Jim was so lovingly describing just then appeared virtually aglow with zillions of tiny red rose hips. Supported by an arbor, this rose is 12 to 15 feet tall, covering an area of 20 by 30 feet. With some help from another climber, 'Shot Silk', the total combined expanse of glorious annual display is 30 by 30!

'Shot Silk' is a charming old rose with dark green foliage and bright pink blooms varying to apricot, orange, yellow, red, and peach tones (weather can dictate the coloring from one season to another) that can reach 10 to 15 feet in California with best bloom early in the season. Jim also mentioned fondly the hybrid musk climber 'Kathleen', which features large clusters of small, fragrant, single blush pink flowers that resemble large apple blossoms (with deep pink buds) borne on a long stem.

Another favored climber is 'Cl. Crimson Glory', the vigorous climbing sport of the famous hybrid tea rose. It produces large, double, velvety, cupped crimson red flowers with a strong Damask fragrance that bloom singly or in small clusters throughout the growing season. Supposedly its flowers are the standard against which all other dark red roses are measured. A second hybrid tea sport, 'Cl. Lady Forteviot', bears yellow blend, strongly scented flowers that bloom in flushes throughout the growing season. Other charming climbing teas are 'Sombreuil', arguably the hardiest and most vigorous of the white teas with very large, creamy blooms, a large repeat flowerer resistant to mildew, one blossom of which is said to scent an entire room; and the rose that Alan told Jim his father had a bud from in his lapel every day of his life, 'Maréchal Niel', a large flowered buttery yellow tea Noisette.

Alan was also fond of the following:

Bourbon roses, ranging in color from deep red through pink, blush, and white, had their heyday from 1830 to 1850. A typical Bourbon has arching growth and lush flowers and the fragrance of a Damask combined with the tendency to rebloom.

R. centifolia 'Muscosa', known as "Common Moss" or "Old Pink Moss," has a rich classic rose fragrance and soft, silvery pink, double cabbage rose bloom and mossy sepals; this easy-to-grow shrub rose originated in France before 1700. Related roses include 'Fantin LaTour' (named for the famous painter of flowers), classified as a cabbage rose with blush pink sweetly perfumed blossoms opening flat to display a layered complexity of petals; it blooms late in the spring on a hardy bush with nicely shaded green leaves and few prickles. Another is 'Petite de Hollande', one of the first and most fragrant miniatures, with small, globular buds opening into bright pink one-inch flowers. The once-blooming compact shrub with small, disease resistant foliage is in perfect proportion to its flowers.

R. damascena 'Bifera': grown since 1000 BC, this pink, loosely petalled, double flowered Damask rose is an informal, upright shrub of medium height and a repeat bloomer perfect for making pot-pouri that puts on just as good a show in autumn as in spring.

R. eglanteria: otherwise known as the sweet briar, it's one of England's favorite roses with clear pink single flowers and foliage that smells of pippin apples. Shrub or climber—if you want an impenetrable hedge, the sweet briar is for you. Bright orange rose hips very high in Vitamin C follow the flowers.

R. gallica: the "French rose" bears once blooming, fragrant roses but may bloom up to six weeks and can spread to form thickets. One of the oldest roses bred, this group has been called the "mad Gallicas" because of their often wild and intense variations on rose-red coloring, including some striped and spotted varieties!

In case you've been tempted by the descriptions of these beauties, Jim assured me that Orin Martin, Chadwick Garden manager, makes sure that Lumberman's Garden Center (formerly San Lorenzo Garden Center) at 235 River Street stocks his favorites. Jim also recommends checking out Roses of Yesterday and Today (formerly Tillotson's) at 803 Brown's Valley Road in Watsonville. Their phone number is (831) 728-1901. They feature old, rare, unusual, and selected modern roses, with gardens open daily 9 to 4.

If you're interested in learning more about rose varieties and how to cultivate them using organic techniques, Orin has written a wonderful short guide to the topic. *Rose Primer: An Organic Approach to Rose Selection and Care,* is available for $10 plus $2 postage and handling from the Friends of the UCSC Farm & Garden, 1156 High Street, Santa Cruz, CA 95064, attn: Rose Book (please make checks to UC Regents).

Apprenticeship Wins Top Honor in Sustainable Agriculture

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

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

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

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

As Leap invited the rest of the apprenticeship staff and long-term supporters to stand, they were greeted by a sustained round of enthusiastic applause.

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

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

The apprenticeship is the oldest program of the Center for Agroecology and Sustainable Food Systems, which is part of the Division of Social Sciences.

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

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

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

– Jennifer McNulty

Apprenticeship staff members (standing, l–r): Christof Bernau, Jim Leap, Nancy Vail, Orin Martin, Ann Lindsey; (kneeling, l–r): Julie Stultz, Diane Nichols

The Apprenticeship in Ecological Horticulture: A Brief History

Editor's note: For those of you new to the Friends of the Farm & Garden, or not familiar with the Apprenticeship, this brief history by garden manager Christof Bernau may prove helpful.

In 1967 the groundwork for what evolved into the Apprenticeship program was laid with the arrival of Alan Chadwick, an itinerant Shakespearean actor and master horticulturalist from England. With the help of a dedicated core of students from the new UCSC campus, Chadwick worked tirelessly to carve a four-acre garden from a steep, stony, chaparral-covered hillside. Chadwick's commanding personality and the beauty of the developing garden quickly became an irresistible draw for students and helped create "a sense of place" amidst the social and political turmoil surrounding events of the late sixties.

Chadwick brought to Santa Cruz the French intensive/Biodynamic method, which synthesized production techniques from the Greeks, Romans, the Chinese and from 19th century French market gardeners (see story, page 1). This system emphasized deep reverence for the

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Dealing with Frost-damaged Citrus

Recent freezing temperatures in many parts of California have injured some citrus trees and other frost-sensitive subtropical plants. But since the full extent of injury won't be known for several months, UC Cooperative Extension (UCCE) horticulture advisor Ed Perry suggests gardeners wait until spring before pruning and removing damaged trees and plants.

The frost injury to plants depends upon a number of factors, including species, age, health, soil moisture and location. Frost injures plants by causing ice crystals to form in plant cells, making water unavailable to plant tissues and disrupting the movement of fluids. Frost-damaged leaves appear water-soaked, wither, and turn dark brown or black. Unprotected, sensitive young trees may be killed, but frost rarely kills mature trees in California.

"While you may be tempted to prune out damaged branches right away, it's best to wait until spring when new growth will show you the extent of the injury," said Perry of Stanislaus County. "Always allow plenty of time for new growth to take place, so that the damage is clearly defined. Earlier pruning often results in leaving some limbs which might continue to die back, and the removal of limbs which might recover."

If a one- or two-year-old citrus tree has been killed almost to the ground, it's important to determine whether the dead wood extends below the bud union, something best done in April or later.

"If only the roots survive and grow back, you may be left with an unproductive rootstock instead of the true-to-type citrus tree you originally planted. In this case, the tree should be replaced," Perry said. "If there is enough live wood above the bud union to grow a strong shoot, a new trunk will develop."

The only treatment that should be applied rapidly after a freeze is whitewashing, according to UCCE citrus farm advisor Ben Faber of Ventura County.

"Often the most severe damage following a freeze results from sunburn of exposed twigs and branches after defoliation," Faber said. "If a tree has been defoliated, paint or spray on water-diluted white latex paint to protect the bark from the sun."

The citrus fruit itself is often damaged by frost. Within a few hours after critically low temperatures, ice crystals form inside the juice vesicles, causing the vesicles to rupture. This results in water loss, causing the fruit to dry out. Frost-damaged fruit must be used quickly, because they break down rapidly and are subject to decay. Deterioration of frost-damaged fruit usually occurs within a few days to a couple of weeks, depending on storage conditions.

"Pick all the frost-damaged fruit as soon as possible," Perry said. "That will remove some of the stress from a weakened tree, and allow you to use the fruit before they break down entirely."

Also, decrease or withhold nitrogen fertilizer applications to severely damaged citrus trees and irrigate carefully.

"Frozen trees have been thrown out of balance. They have the same amount of roots as before, which are now supplying a much-reduced top," Perry said. "The result is a tremendous amount of new growth breaking out all over the trunk and uninjured branches. It's best that the new shoots grow at a moderate rate."

The UC advisors say a quick-acting nitrogen fertilizer may stimulate excessive water sprout and sucker growth, which makes reshaping the tree more difficult. Over-irrigation may induce root damage and encourage growth of root rotting organisms. Irrigation should be less frequent and in smaller amounts until trees have regained their normal foliage.

From a UC Cooperative Extension press release, January 22, 2007

Apprenticeship History *(from page 7)*

soil and the biological community, the conservation of resources and working with nature's cycles. At a time when supermarket produce aisles offered consumers little more than iceberg lettuce and red and golden delicious apples, Chadwick cultivated a dizzying array of heirloom vegetables, fruits, and flowers.

In 1971, using their newfound knowledge, an inspired group of individuals established a second site on the campus to put Chadwick's techniques to work on what would ultimately become the present 25-acre UCSC Farm.

Also in 1971, the "Friends of the Farm and Garden" was founded to support the education and outreach efforts of the Farm. With campus and UC Extension support, the Apprenticeship in Ecological Horticulture was established in 1975 as a year long program to formalize the trainings available to participants. By 1981, the Apprenticeship transitioned to a streamlined, intensive six month program.

Over our forty year history we have continued to evolve and adapt the curriculum and production practices to meet the changing needs of our audience and to blend the best features of the apprenticeship style and academic models of learning. At the core is what we refer to as the "I do, we do, you do" approach to imparting practical skills and the constant refrain of "It depends," all with an eye towards facilitating the development of independent critical thinking and observation skills. Simultaneously, it has always been our goal to maintain a vibrant and productive learning environment that fuels apprentices in their passions to positively impact the world.

Much like in Chadwick's era, these days everyone involved with the UCSC Farm & Garden is immersed in a world of incredible crop diversity, but really our most important annual crop, because of the promise for the future they hold, is each season's group of apprentices.

With the upcoming "Back 40" celebration approaching, marking 40 years of apprentice training at UCSC, we've been in touch with a number of apprenticeshi graduates to find out what they're up to these days. Here are some we've heard from:

Shayna Bailey returned to Athens, Georgia, from the Virgin Islands Sustainable Farm Institute in St. Croix in 2006 to join the University of Georgia as Project Coordinator of the Certificate Program in Organic Agriculture. As Project Coordinator, Shayna manages 2 acres of mixed vegetable and fruit production, coordinates program marketing and recruiting, and assists faculty members with field instruction.

Colby Eierman (1999) is director of gardens for COPIA: The American Center for Wine, Food and the Arts in Napa, California. For information on COPIA and its programs, see www.copia.org/gardens.

Ken Foster (1985) owns Terra Nova Ecological Landscaping, an award-winning eco-landscaping business based in Santa Cruz, California. For more information, see www.terranovalandscaping.com.

Marco Franciosa and **Shawn Harrison** (1997) started the Soil Born Farm Urban Agriculture Project in Sacramento, California. They write, "Soil Born Farm Urban Agriculture Project allows youth and adults to rediscover and participate in a system of food production and distribution that promotes healthy living, nurtures the environment, and brings people together to share the simple pleasures of living life in harmony with nature. We are committed to developing programming focused on organic food production, healthy food education and food access for all residents." For more on their project, see www.soilborn.org.

Kat Goodwin (2002) is the Garden Manager for a 1.5-acre organic veggie/flower garden at Corona Creek Vineyards, which sells to the Petaluma Farmer's Market and restaurants in Sonoma County. See www.coronacreekvineyards.com for more information.

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.

Terry Hooker (1996) helped found and manages the Cal Poly Organic Farm at Cal Poly San Luis Obispo, which includes a 250-member CSA program. Says Terry, "I am really excited about what we have started here at Cal Poly because there are so many graduates from here that go on to work in the agriculture sector and we at Cal Poly Organic Farm have a chance to demonstrate that certified organic and sustainable agriculture practices are viable options to conventional practices. Our graduates will carry this experience with them and they will help to shape a sustainable future."

Abby Jaramillo (Rosenheck) (2000) is executive director of the school garden organization Urban Sprouts in San Francisco, which serves low-income youth from San Francisco's under-served neighborhoods. "We teach youth to grow, harvest, prepare and eat vegetables from the school garden, in order to help youth become more engaged in school, eat better and exercise more, and connect with the environment and each other." For more on Abby's program, see www.urbansprouts.org.

Anni Jensen (1981) is a seed propagator at Annie's Annuals in Richmond, California, producing "Rare, unusual annuals and perennial plants, including cottage garden heirlooms and hard to find California native wildflowers." For more, see www.anniesannuals.com.

Godfrey Dembe Kasozi (1999) directs the Organic Centre for Environment Technology and Rural Development (CETRUD), in Kasese, Uganda. This organic farming and training center offers business advice, grower training, demonstrations, and production of organic products. For more on the program, see www.cetrud.org

Edwin Marty and **Page Allison (Roper)** (1998) founded Jones Valley Urban Farm in Birmingham, Alabama, where Edwin is director. According to the project's web site, "Jones Valley Urban Farm is a non-profit organization dedicated to reclaiming vacant urban lots and converting them to productive use. In addition to growing fruits, vegetables and cut flowers, the urban farm is an important community resource providing educational and economic opportunities in an urban setting."

Starting with a 1-acre urban farm on the south side of Birmingham, the project has grown to include four sites and a variety of educational and production programs, including an "exchange" program in which city youth work on rural area organic farms, and youth from outside the city work at the program's urban farms. For more information on this unique program, see www.jvuf.org.

Jude Moran (2005) checked in from Boulder, Utah, where she's the gardener for Hell's Backbone Grill. According to the restaurant's web site, "The food served at Hell's Backbone Grill emphasizes regional cuisine using locally produced ingredients, including organic vegetables, herbs and flowers from the restaurant's own on-site gardens. We compost all of our vegetable waste in bins

continued on page 12

The French Intensive Method *(from page 2)*

particles of clay leach downward, accumulate in layers, and create subsurface compaction or a hard pan.

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

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

Styles/Tools/Techniques of Cultivation

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

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

Left to right: D-handle spade, tilthing fork, metal bow rake

Intensive Spacing of Plants and High Yield/Area

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

Intercropping

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

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

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

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

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

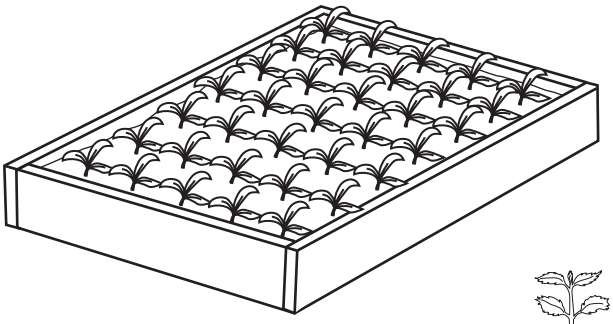
The Use of Fully Mature Compost

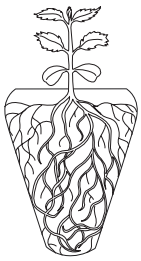
The more mature and particulate (fine) the compost, the greater and quicker the nutrient availability. This system is predicated on the ability to skim—remove a crop, prepare the bed and seed or transplant on the same day, leading to efficient, intensive use of available land. This is only possible with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

A Soil Ethic, or an Insane Reverence for Soil
(see Chadwick quote, page 1)

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

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





Above: Wooden tray used for starting seeds; right: transplant from cell tray/6 pack showing well-developed root system.

Extensive Use of Transplants

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

• More intensive use of land available by more precise placement of transplants and elimination of skips and gaps that often result from direct seeding

• Transplants tie up the ground for a shorter period of time than direct seeding.

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

• Transplants also give plants a head start over weed pressure.

• It takes less labor and water to tend the trans plants than seeds and small seedlings in the ground.

• Transplants allow a head start on the growing season.

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

Evenness Principle

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

• Watering–spread and depth

• Cultivation (digging, loft, edging, tilling, raking and shaping)

• Compost application and depth of incorporation

• Seed sowing (distribution)

• Seed coverage

• Transplanting

• Weeding, hoeing

• Anon, anon, anon.

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

Labor as Well as Plant Intensive

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

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

References

Alan Chadwick's Enchanted Garden, by Tom Cuthbertson. New York: Dutton, 1978.

Better Vegetable Gardens the Chinese Way, by Peter Chan (out of print, but available used).

French Market Gardening, by John Weathers. W. London: Ablemare St., 1909

French Intensive Gardening, by A. M. Macself. London: W.H. & L. Collingridge Ltd., (date unknown).

How to Grow More Vegetables . . . Than You Ever Thought Possible on Less Land Than You Can Imagine, by John Jeavons. Berkeley: Ten Speed Press, 2006.

Intensive Culture of Vegetables [French system], by P. Aquatias. London: L. Upcott Gioll, London, 1913. Reprinted by Solar Survival Press, Harrisville, VT, 1978.

The Self Sufficient Gardener: A Complete Guide to Growing and Preserving All Your Own Food, by John Seymour. Doubleday, 1979.

What Makes the Crops Rejoice: An Introduction to Gardening, by Robert Howard with Eric Skjei. Boston: Little, Brown, 1986.

Apprentice Updates *(from page 9)*

that are located on the lodge grounds." Jude also helps manage an historic orchard that provides apricots, pears, plums, apples, and other fruit for the restaurant.

Greg Peck (1996) is at Cornell University, where he's currently working on a PhD project investigating the sustainability of organic and integrated fruit production systems for New York state. Writes Greg, "Organic apple production in the Northeast is the final frontier of organics—really one of the few crops that has not successfully been commercially produced in the Northeast. I expect results from my project to foster a more local food system allowing consumers to purchase produce grown within a few hours drive of their home, as opposed to fruit that must be shipped from distant states or countries." **Kathi Colen Peck** (1995) is the Farm Leader for *Compos Mentis* (Latin for "of sound mind"), a non-profit that offers a seasonal haven (on a 40-acre farm) for young adults who have been diagnosed with depression, bipolar disorder or schizophrenia.

Kathi is also the conference organizer for the second National Conference on Facilitating Sustainable Agriculture Education, planned for July 11-14, 2007, in Ithaca. For more on the conference, see www.hort.cornell.edu/SustAgEd.

Corie Pierce (2005) is the farm manager and instructor at the Student Organic Farm at Michigan State University in East Lansing, Michigan. Corie writes, "I developed and now run (along with 2 other people) the Organic Farming Certificate Program (1 year long, year round CSA and seasonal farmstand) at MSU. We are just kicking off our inaugural class of 9 apprentices! See www.msuorganicfarm.org for more information.

Ted Purdy (2001) is the Youth Farm Coordinator for the FOOD for Lane County Farm in Springfield, Oregon, where his job involves overseeing and managing all aspects of production, planning, marketing, volunteer coordination,and community garden management at the 3-acre urban educational farm.

Writes Ted: "Since 1998, low-income teenagers, aged 14-18, have worked at the farm, gaining job skills while learning about organic farming and gardening, nutrition, teamwork, leadership, and small business management. During the summer months a crew of 15-18 teenagers are hired to participate in all aspects of running a successful small organic farm. They help cultivate over 40 types of vegetables and fruits on the farm from seed to harvest, learning and growing while they work. Project emphasis is placed on the youth developing personal goals, exploring career options, and building the interpersonal and work skills they will need to succeed as young adults."

Stuart Schroeder (1982) runs Stone Horse in Sonoma County, California, where he provides a variety of farming and land management services using draft horses. Writes Stuart, "We . . . plow gardens and mow large yards or fields for fire prevention. In the woods we can maneuver logs to access roads with no damage to standing trees and minimal soil disturbance. Draft horse power has many versatile applications, but the effect is the same . . . graceful, powerful, unique." For more on Stone Horse, see www.stonehorse.biz.

Julie Stultz, the Farm's production manager, has put together a wonderful PowerPoint presentation from photos sent by these and many other apprentice grads to use at the upcoming Friends' Annual Meeting (see page 3) and the 40th Anniversary event in July. If you'd like your photo and information included in the presentation, contact Julie at jstultz@ucsc.edu or call 831.459-4661.

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