

News & Notes of the UCSC Farm & Garden

Issue 140, Winter 2014

For the Home Orchardist Thoughts on Pruning & Training Deciduous Fruit Trees

– Orin Martin

“Pruning is a useful skill. In that way it’s a lot like driving—but if you don’t know where you’re going and how to get there, it doesn’t do you much good...”

– Jim Rider, preeminent Pajaro Valley organic apple grower

So where are we going and how will we get there? In a nutshell, fruit tree growing is about striking a balance between vegetative vigor (having enough tree) and fruitfulness. Thus we are headed toward a tree that is size manageable (8–12 feet tall) and has a relatively permanent structure of branches that are mechanically sound and self-supporting. Ideally, the tree carries both a good quantity and quality of fruit each year. Such a tree should fill the space allotted for it (and fill it quickly) but not overfill it.

This idealized tree or set of trees should embody the two critical components of sunlight management: interception and distribution/infiltration. In this article I’ll discuss how to use pruning and training to achieve this goal, specifically with the Open Center tree form.

Interception

Again, the goal is to have enough tree structure with well-spaced branches projected up and outward to support good leaf area. Optimal leaf area intercepts enough direct sunlight to achieve maximum photosynthesis in order to manufacture carbohydrates (mostly sugars) and growth hormones. These carbohydrates and hormones are used to first grow a tree—root, shoot, leaf and branch—and when the tree’s structural needs have been satisfied, to make quality fruit. Remember, fruit is produced largely from one source—the sun. So, *Fiat Lux*—“Let there be light.”

Distribution/Infiltration

In order to make and maintain quality fruit buds, 50–80 percent direct sunlight needs to strike all portions of a tree. Sunlight doesn’t naturally move more than 3 to 4 feet into a canopy. At 3 feet into a canopy, light can be reduced by as much as 60 percent. Thus, good interior sunlight distribution relies on a tree form that arranges branches so as to create shafts or chimneys of light into the tree’s interior. Such forms reinforce that old fruit tree grower’s pseudo-haiku/axiom, “The more light you intercept, the more fruit you get.”

The path to getting there is to grow trees to articulated, proven forms:

- Open Center
- Modified Central Leader
- Slender Spindle/Vertical Axe
- Espalier, etc.

The primary tools used to achieve this aim are training and pruning.

Training

Tree training is simply the manipulation or bending of a branch. A branch may be moved up, down, or horizontally. Upright growth is vegetatively vigorous. As a branch ages, the weight of wood and fruit bend it toward horizontal. As the branch bends, hormonal processes slow extension growth and increase fruiting.

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Lowering or bending a branch towards horizontal using weights or a tie-down (string and stakes) will keep a tree in its allotted space and hasten the time of fruiting. The moving of branches horizontally also spreads and distributes branches evenly around the 360 degrees of the trunk and allows better sunlight distribution within the tree. It is better to think of training and pruning in tandem, in both summer and winter, to achieve balance as per fruiting and growth, and to achieve the optimal tree form.

Pruning

Pruning can be thought of as a conversation or dialogue with a tree over time. It's akin to the call and response of African-American church music, as in, the tree does this, you do that, then the tree does this...

More simply put, pruning is the adjustment (shortening) or eliminating of a branch. The purpose of pruning is to regulate size and form and to direct growth for the purpose of balancing fruiting and vegetative growth. It implies a well thought out, rational, purposeful cutting.

Although there are no strictly right or wrong approaches to pruning, it is important to prune with a plan, a few simple goals, and a clear sense of the trees' intended form. This is important because function (balanced growth and fruiting) follows form. Pruning is a linear, logical process. You should be able to justify every cut you do or don't make. Again, the goal of pruning is to create a logical, permanent branch framework with good branch exposure to sunlight, on which quality fruit is borne.

In order to prune purposefully, it is important to understand the different types of cuts, their effect on tree growth, and when to employ them.

Winter pruning is invigorating and stimulates branch extension in the following growing season. As such, it is used to establish trees and tree forms:

- # of branches
- length of branches
- direction of branches

Summer pruning dwarfs a tree. Thus, it is used to tone down growth once a tree is established. It is also used to induce rapid fruit bud development on lateral branches.

With young trees, the goal of pruning is to shape and establish tree form and structure. As a tree matures, the goals of pruning are to control tree height, canopy volume, and to maintain shafts of light into the center of the tree.

There are two types of pruning cuts: *Heading cuts*, which stimulate extension growth, and *thinning cuts*, which eliminate branches (often the 4 Ds – dead, damaged, diseased and disoriented).

There are also 3 categories of heading cuts (in winter pruning):

- heading: creates and stimulates branch growth
- shortening: stops further branch development
- renewing: regrows a branch

Heading Cuts

The term "heading" refers to cutting back a branch a portion of its previous season's growth (1 year old wood). Heading cuts (in winter) stimulate branch growth in the following growing season. The specific nature of the stimulation is: the topmost remaining bud on a branch is stimulated to grow and extend the branch. The next few buds down the branch will break from dormancy and grow as weak/moderate lateral branches ("laterals"). As almost all species of fruit bear almost all of their fruit on laterals, it is easy to quip, "laterals are our friends." On most species, these laterals will grow vegetatively the first year and begin to fruit the 2nd or 3rd year.

When heading back a branch, the magnitude of the growth response is directly proportional to the amount the branch is cut back: the harder the cut, the longer and stronger the response. Note: most species of fruit only bear fruit on two year and older wood. Pruning stimulates new growth, thus delaying fruiting—basically, trees try to grow back what was pruned off in an effort to reestablish root/shoot equilibrium. Your task is to control how much growth, where, and in what direction. As a set of examples:

an unpruned branch will grow minimally (often only inches) and set up fruit on the limb

a light pruning cut (less than 25% of the previous season's growth) will generate a weak response (< 1 ft)

a moderate pruning cut (25%–50% of the previous season's growth) begets a moderate response (> 1 ft)

a heavy pruning cut (>50% of the previous season's growth) causes a strong growth response (>2 ft)

Pruning with moderate heading cuts begets more overall growth: a longer primary branch with a number of fruiting laterals. It also delays fruiting for at least 2 years. However, when this branch complex does fruit, it will have more fruit than the unpruned branch. Another dividend of pruning is that it thickens and strengthens branches.

In a sense then, there is only one operative question to ask (and answer) when looking at a branch: Do I want it to grow more? If the answer is yes, prune it with a heading cut. If the growth goals are high, head it back a lot. If the growth goals are minimal, head it lightly.

Shortening Cuts: A shortening cut involves cutting back an established branch (> 5 years old) slightly into older wood. This tends to stop further extension growth. It is used when a branch has filled its allotted space.

Renewal Cuts: Another category of heading cut is the renewal cut. It involves cutting a mature branch (>7–8

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Winter/early Spring Calendar

Stone Fruit Tree Pruning

Saturday, February 15, 10 am – 1 pm

Louise Cain Gatehouse, UCSC Farm

Join Orin Martin and Zoe Hitchner of the Alan Chadwick Garden, and Orchard Keepers owner Matthew Sutton at the UCSC Farm for a workshop on pruning peaches, plums, apricots, and other stone fruits. This lecture and demonstration class will show you how to prune your stone fruit trees to maximize health and production.

Wear warm clothes and bring a snack.

Pre-registration costs: \$30 general public; \$20 Friends of the UCSC Farm and Garden; \$5 current UCSC students. *Register online or by check; details at:* pruningstone.bpt.me
At the door: \$40 general; \$30 Friends; \$5 students (cash or check only).

Growing Blueberries in the Home Garden

Saturday, February 15, 10 am – 1 pm

Louise Cain Gatehouse, UCSC Farm

Liz Milazzo, field production manager of the UCSC Farm, will discuss soil preparation, planting, pruning, and other care tips for blueberries. Learn about varieties that perform well in this region. Wear warm clothes and bring a snack.

Pre-registration costs: \$30 general public; \$20 Friends of the UCSC Farm and Garden; \$5 current UCSC students. *Register online or by check; details at:* berryclass.bpt.me
At the door: \$40 general; \$30 Friends; \$5 students (cash or check only).

Life Lab Offers Professional Development Workshops at the UCSC Farm

In Life Lab's amazing Garden Classroom on the UC Santa Cruz campus, professional trainers bring inspiration and information to educators interested in bringing learning to life in the garden.

The 2014 Spring-Summer Life Lab Educator Workshops topics include –

- Sowing the Seeds of Wonder: Discovering the Garden in Early Childhood Education
- The Growing Classroom: 2-day Intensive on Garden-Based Learning
- Plant It, Grow It, Eat It! Garden-Enhanced Nutrition Education
- Growing Healthy, Strong, Inspired Teens

For a schedule and registration details, see – www.lifelab.org/for-educators/

Fruit Tree Grafting Workshop

Saturday, March 8, 10 am – 4 pm

Alan Chadwick Garden, UC Santa Cruz

Join us on Saturday, March 8, for a day-long workshop at the Alan Chadwick Garden focused on grafting apple and pear trees. The instructors are Orin Martin and Sky DeMuro of the Alan Chadwick Garden, and Matthew Sutton, owner of Orchard Keepers.

In this hands-on workshop, instructors will lead participants through grafting young pome fruit trees, and participants will graft a tree to take home. We will also demonstrate how to “top graft” new varieties onto older, established trees. This workshop is geared towards beginner and intermediate backyard orchardists and fruit tree enthusiasts. Some knowledge of fruit trees will be helpful, but everyone is welcome.

Workshop costs: \$95 general/\$85 Friends of the UCSC Farm & Garden/\$50 UCSC students and limited income participants. Registration includes handouts, rootstock, and tools, but bring a grafting knife if you have one. Coffee, tea and snacks will be provided; please bring your own lunch.

Registration deadline is March 6, pre-registration is required, and class size is limited.

Register online at applegrafting.bpt.me

If you prefer to register for this class by mail (no service charge), please send a check **made payable to UC Regents to:**

Amy Bolton, CASFS
1156 High Street
Santa Cruz, CA 95064 attn: Grafting class

Please include your contact information (phone and email) with your check.

Also coming up at the UCSC Farm & Alan Chadwick Garden

- March 15, 22 and 29: **Garden Cruz: Organic Matters** (see next page for details)
- April 6, 2-3:30 pm: **Free, Docent-Led Tour of the UCSC Farm.** Meet at the Louise Cain Gatehouse.
- April 26, 1 pm–5 pm: **Citrus Selection, Planting and Care.** Meet at the Louise Cain Gatehouse.

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

For more 2014 events, see [Upcoming Events at casfs.ucsc.edu](http://Upcoming%20Events%20at%20casfs.ucsc.edu). Co-sponsored by the Center for Agroecology & Sustainable Food Systems at UC Santa Cruz, and the Friends of the UCSC Farm & Garden.

New Grants Bolster Education and Outreach

This fall the Center for Agroecology & Sustainable Food Systems (CASFS) received a number of new grants to support the Apprenticeship Program's training of new organic farmers and gardeners, as well as to expand and improve educational offerings for undergraduates, beginning farmers, and the general public at the CASFS Farm and Alan Chadwick Garden. Other grants have helped us spearhead new projects that take us out into the region to partner with other schools and sustainable food and agriculture groups.

We are grateful for the **True North Foundation's** \$40,000 grant, which will primarily support the Community Supported Agriculture (CSA) training as part of the Apprenticeship. A portion of this grant will also fund the effort to develop more undergraduate courses and internships while improving existing ones at the Farm & Garden. This support and an earlier \$75,000 grant from the **Clarence E. Heller Charitable Foundation** will help build a foundation for a future sustainable agriculture major at UCSC. CASFS and the Environmental Studies Department are using a new **USDA Higher Education Challenge Grant** to strengthen this undergraduate work as well as to build connections with high school programs in the region to increase recruitment from underrepresented groups into agroecology and sustainable food systems studies.

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CSA Memberships for 2014 Are Now Available

Memberships in the UCSC Farm's 2014 Community Supported Agriculture (CSA) project are now available. Our planned start date is June 4, with the full CSA season (22 weeks) extending through November 1, weather permitting. This year we're again offering a half-season option, with the "late-season share" starting on August 20 and running through November 1.

Along with an array of seasonal, fresh-picked produce, members also receive a weekly CSA newsletter with recipes and farm updates, and a complimentary membership to the Friends of the Farm & Garden for the duration of the CSA season.

Cost of a share for the full 2014 season is \$560; a late (half) season share is \$280. Payment plans and low-income shares are available. The CSA also accepts SNAP benefits.

For more information or to receive a CSA brochure, call 831.459-3240 or email farmcsa@ucsc.edu. Or go to casfs.ucsc.edu; on the lower part of the home page, find out more about the CSA at the *Produce and Plant Sales* link, and find a link to the *CSA Pledge Form* under Quick Links.

3-Saturday Garden Cruz: Organic Matters Workshop Offered in March

Join us on March 15, 22 and 29th from 10 am – 4 pm to learn the suite of skills you need to create and maintain a thriving organic garden, including –

- Understanding and improving your soil's fertility and structure
- Preparing garden beds
- Direct seeding and transplanting
- Irrigating, with an emphasis on water-saving techniques
- Controlling gophers and other pests
- Making and using compost, cover crops, and other fertility sources

Each day will include both lectures and hands-on activities, giving each participant an opportunity to "learn by doing."

Taught by Orin Martin and Sky DeMuro of the Alan Chadwick Garden, this course is ideal for community members and students involved in campus and community gardens, or looking to enhance their ability to grow food and flowers at home.

Cost: \$300 General Public; \$275 Friends of the UCSC Farm & Garden; \$175 Farm & Garden Docents; \$150 UCSC Students/Limited Income participants.

Class size is limited and pre-registration is required by March 11. Workshop registration cost includes reading materials, coffee, tea and snacks. Please bring your own lunch. Tools are provided.

Register online at: gardencruz2014.bpt.me.

If you prefer to register for this class by mail (no service charge), please send a check made payable to UC Regents to:

Amy Bolton, CASFS
1156 High Street
Santa Cruz, CA 95064
attn: Garden Cruz class

Please include your contact information (phone and email) with your check. Questions? Call Amy Bolton at 831.459-3240 or contact her by email at casfs@ucsc.edu.

New Center for Agroecology & Sustainable Food Systems (CASFS) Website Debuts

If you've not yet seen the redesigned CASFS website, check it out at casfs.ucsc.edu.

You'll find links to free gardening publications, upcoming events, recipes, tour information, and the many programs taking place at the UCSC Farm & Garden. Find out about current research projects, education programs, Farm & Garden history, and much more.

Ideas for Responding to the Drought

Note: A version of this article originally appeared in January 2012. It's been updated to reflect current conditions.

Now into our second year of drought in California, I once again asked garden manager Christof Bernau for his thoughts on how to approach water conservation in the home garden and landscape.

"First and foremost," says Bernau, "keep in mind that plants use far less water during the winter months." As air and soil temperatures fall and daylight hours decrease, growth rates and biological activity also drop.

"Cooler temperatures and shorter days mean that plants are taking up far less water from the soil than they are in the late spring, summer and early fall, and the soil is losing less moisture to evaporation," says Bernau. "All of that gives us the opportunity to be more conservative in our water use, especially with well-established plants whether or not they're considered 'drought tolerant'."

Nonetheless, notes Bernau, you do have to be careful about being too conservative—especially with more recently established plants and those with shallow roots, as soils this fall and winter dried down to depths of 6–8 inches.

"Newly planted perennials, salad greens, and plants with shallower root systems need to be buffered against lack of moisture in the surface soil, as do recently planted trees and cane fruits," says Bernau. This is especially true if you've done any type of cultivation or other soil disturbance that introduces air into the soil, which makes it more vulnerable to drying. Plants prone to drying out may need to be watered every ten to twenty days during a prolonged dry period.

"For any new plantings, be proactive," says Bernau. "A thick layer of mulch and incorporating organic matter into the soil will help conserve what water you do apply." And although he wouldn't normally encourage mulching cane fruits except during the first year of establishment to conserve moisture and control weeds, it may be beneficial to mulch existing plantings to reduce water demand and to keep plants happy while using less water. Mulches for established cane fruit are not usually recommended due to the potential for promoting fungal problems and root rotting, but this year may be an exception.

Most lawn grasses have roots that only reach 6–8 inches deep, but because their growth slows in the fall they can go for a relatively long time without irrigation. Bernau recommends that gardeners use a soil auger or other coring device to check for moisture in the root zone and respond with supplemental water if the root zone begins to dry out. Or consider replacing lawns with a more drought-tolerant alternative; note that the city of Santa Cruz is currently offering rebates and ideas for lawn replacements (see below).

Newly planted strawberries with their shallow root systems may also need supplemental water in this dry spell. This is especially true if you use any type of high nitrogen granulated fertilizer (including organic fertilizers), which introduce salts into the soil. "When the rains aren't moving the salts out of the root zone, they can build up to the point that they damage the plants," says Bernau.

- Determine the tolerance levels of your landscape – can you water less frequently and deeper?
- Apply water early and late in the day to minimize evaporation and keep more water in the root zone
- Eliminate inefficient spray patterns from sprinkler systems, and make sure your system isn't watering your "hardscape"
- Look for and repair leaks
- If it does rain, turn off automatic sprinkler systems and be ready with buckets and rain barrels to catch rainwater for later use (see below re: rain barrel availability in the city of Santa Cruz)
- Catch "warm up water" from the shower and sinks in a bucket; either transfer the water to a watering can or pour it from the bucket over mulch to minimize soil crusting

Other plants that may need extra irrigation during a winter drought include citrus, which have relatively shallow roots and are developing roots as well as carrying, sizing and maturing fruit this time of year. "In a 'normal' late fall and winter there'd be no need to irrigate citrus, but in a long dry spell it pays to water to ensure that the fruit has an adequate juice content," says Bernau. Here again, mulching the root zone with a generous layer of woodchips or comparable mulch will help conserve moisture.

Deciduous fruit trees and cane fruits need less water in a dry winter because little is happening in the way of growth. However, by early February in the Monterey Bay region these plants start to develop new roots and extend existing roots. "Available soil moisture is critical to that process," says Bernau. If the rains do not return with relative consistency, he recommends that those growing cane fruits and deciduous pome and stone fruits should sample soil moisture in the root zone every 2–3 weeks and deliver water as necessary to a depth of 15–24" to meet early season growth needs.

He also notes that cold temperatures can combine with drought conditions to exacerbate plant damage—another reason to provide supplemental water to some plants. "Water in the cells protects plants against frost," Bernau explains. "And even though every plant has its own inherent frost tolerance threshold, those stressed by drought become that much more vulnerable to frost damage."

Finally, it's important to keep an eye on the weather in order to make informed watering decisions. Bernau sounded a cautiously optimistic note about the potential for rainfall this season. "There's always a chance that the high pressure ridge can weaken. If there's rain in the forecast hold off on irrigation to see how much the storm actually delivers. If it does rain, you've saved water, kept your water bill down, and helped conserve your water table if you're on a well."

– Martha Brown

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

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

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years old) back radically to a stub (4"–10" long). It is used when a branch is too long and is shading other branches. This extreme cut regrows the branch, albeit in a weaker manner over the course of 4–5 years. It should be employed sparingly.

Thinning Cuts: The other basic cut is the thinning cut, which completely removes an entire branch at its point of origin. There should be no regrowth. These cuts are used to eliminate overly vigorous, misplaced, or shading branches as well as exceedingly weak branches. There is no stimulating effect from a thinning cut as there is no branch remaining to grow back. If unexpected new shoots appear, thin them immediately.

Open Center Tree Form

The open center tree form mimics the geometry of a cone, with a wide circular top and a relatively narrow base. For the open center form, think "big sun cup." Fill the cup with sunshine and fill your life with fruit.

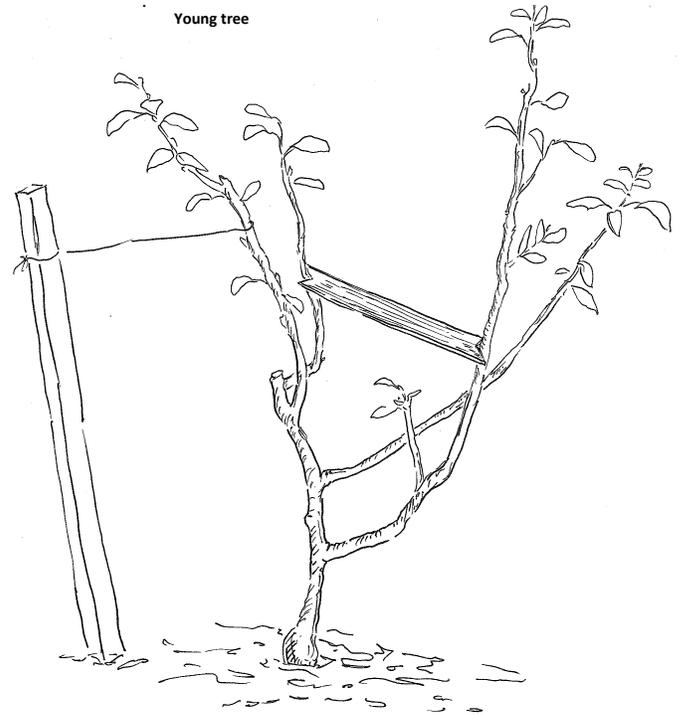
In general, this form is a "looser" training system than leader forms (e.g., the modified central leader or vertical axe, mentioned above). It is more about filling space appropriately than adhering to a strict, sculpted form. With open center trees, often more primary branches are retained early in a tree's life and subsequently thinned out as a response to light infiltration within the canopy. Remember: Light does not penetrate more than 3–4' into the canopy, so shafts of light need to be created via pruning and training.

The open center form is usually the form of choice for stone fruits (peaches, apricots, plums, etc.) and can be used with pome fruits (apples and pears) along with the various leader forms. While easy to understand and execute, the open center form has less fruit-bearing surface compared with leader forms. At maturation, the tree tends to "umbrella out," the result being—

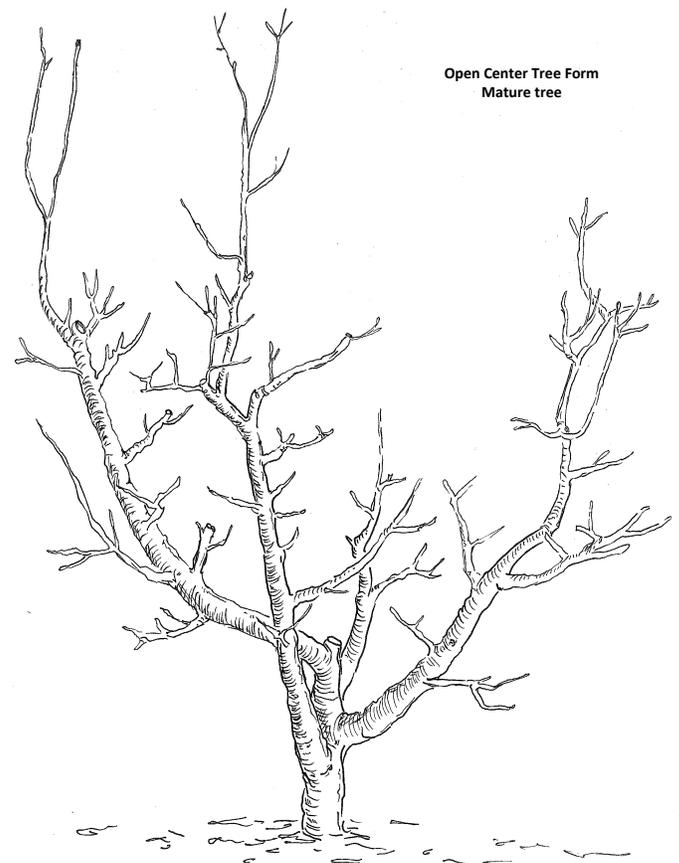
- shading the bottom of the tree
- shading neighboring trees, and
- loss of vigor in the top of the tree

A well-formed open center tree consists of 3–5 primary branches (multiple leaders) arising from the trunk at 18"–30" above the ground. These primaries should grow (or be trained) up and outward at an angle of 60–75° above horizontal. They should be of equal vigor and be spaced evenly, radially around the trunk. They may feature Ys or forks to increase bearing surface.

The last component of form is the lateral, fruit-bearing branch structure. Laterals, or "fruit hangers" as peach growers refer to them, should be short (6–15"), stout/strong (mechanically), moderately flat and weak (as pertaining to vegetative vigor). They should be perpendicular to the primary branch; spaced 6–10" apart, vertically; and summer pruned (not winter pruned) on pome fruits.



The open center tree form facilitates light penetration to all parts of the tree: a young tree (top) and a mature tree with 4 primary branches (below). Illustrations by Noah Miska.



Creating the Open Center Tree Form

Select a good caliper ($>1/2''$ diameter) tree, either a whip (unbranched trunk) or branched tree. If using a branched tree, it should have a number of vigorous lateral branches.

If using a whip, after planting, head the whip at 18"–30" above the soil level. A number of buds below the cut should "push" and develop into branches. Select 3–5 of these and proceed as per the branched tree. The primary difference between a whip and a good branched tree is generally 1–2 years' worth of growth. The more developed the tree is at planting, the sooner it will become established and start fruiting.

If using a branched tree to create an open center, thin out the leader. Then select 3–5 of the strongest branches as your primaries, thinning all other branches. The primaries you select should be equally distributed around the 360° of the trunk. If they are not, train them into place using nylon string and a well-driven stake. The branches should be growing up and outward at an angle of 60–75° above horizontal.

It is critical that the multiple leaders of an open center tree be of the same vigor and positioned at the same angle. Cut these branches back (head them) $1/4$ to $1/2$ of their length to an outward (under) facing bud. Think of the top bud on the branch as a directional arrow; the branch will grow in the direction the bud is pointing.

During the first growing season, "micro-manage" these multi-leaders by training them slightly up, down, or sideways. Check them monthly. The goal is to manage for equal growth and a 60–75° angle. Both narrow and wide branch crotch angles are inherently weak and may cause the mature fruit-bearing branch to snap. The desired crotch angle at the base of a branch is 40–60°. If the angle is too narrow, it can be increased by gently inserting a wooden clothespin, a toothpick, or a 2–3" V-notched piece of lathe.

At the end of the first growing season, (winter-dormant pruning), head back the 3–5 primary scaffold branches about 50% of their season's growth. This should be done proportionally to vigor; the weakest branches are cut back the most and vice versa.

These primaries can be cut back to two opposing buds. As they grow into branches in year two, they will form a Y or fork. Do not allow any other buds to form additional strong branches. This forking can be repeated in years 2–4. The net result of forking is to increase the fruit-bearing surface of a tree. This must not be done at the expense of excluding light from the lower portions of the tree.

The training and winter heading cuts are repeated in subsequent years until the tree has reached the size allotted for it. At that juncture, heading cuts cease and shortening cuts are employed.

The lateral fruit-bearing branches that occur on the primary branches are trained towards horizontal and perpendicular to the primary branch. They are not winter pruned, but rather summer pruned to limit growth; look for an article on summer pruning in a future issue of the *News & Notes*.



Joshua Anderson, a 2010 Apprenticeship graduate, is now helping run Boys Grow, an urban farming and value-added project for teenage boys located near Kansas City, Missouri. Josh writes, "At Boys Grow we hire and pay these young men for a two-year commitment to work a 12-acre organic operation and develop their own value added products such as Agave Ketchup, Salsa, and BBQ sauce. Annually we hire a class in groups of 12 and each is responsible for the development of the product, labels, and marketing." Read more about the project at www.boysgrow.com.

Ben Harris (2011) is starting a new farm/CSA project serving the greater Hartford area of Central Connecticut. Read about Root Down Farm at rootdowncsa.com.

Ana Rasmussen (2010), founder of Mesa Verde Gardens, continues to expand the project. She'll oversee the development of a new community garden in the Live Oak neighborhood of Santa Cruz this year. Read about it at http://www.santacruzsentinel.com/santacruz/ci_24856781/mesa-verde-gardens-breaks-ground-live-oak

Jason Mark (2005) wrote the cover article on urban farming for *CCOF Magazine's* Winter 2014 issue. In addition to his work as editor for *Earth Island Journal*, Jason co-founded Alemany Farm in San Francisco (www.alemany-farm.org). You can see the CCOF Magazine article at ccof.org/sites/default/files/CCOF_Mag_Winter_14_web.pdf

Hannah Shulman (2010) was recently hired to direct San Francisco's new Urban Agriculture program. According to an article on the San Francisco Recreation and Parks website, "San Francisco Recreation and Park Department is launching San Francisco's first Urban Agriculture Program that will advocate urban agriculture and coordinate all related activities citywide. The Program will manage and support SF Rec and Park's community gardens as well as expand its coordination to other similar projects on public properties. In addition, the goal of the program includes establishing urban agriculture resource centers, and streamlining application and wait list processes for community gardens and developing new urban farming projects."

Luke Girdling (2013) is managing the West Farm project for Bistro West, a farm to table restaurant in Carlsbad, California. Learn more at <https://www.facebook.com/BistroWest>.

Read more about how apprentices are applying their training at www.growafarmer.org.

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Education and Outreach Grants — from page 4

The **Eucalyptus Foundation** provided a welcome surprise when they increased our grant award to \$150,000 over two years (the request had been for \$125,000). The Eucalyptus grant will support both the Apprenticeship's training of new organic farmers and the undergraduate education based at the Farm & Garden. An anonymous foundation provided a \$40,000 grant this fall to support these education programs along with other outreach and education efforts at CASFS.

The **UNFI Foundation** has provided a \$15,000 grant for that most wonderful thing called "general support" of all that we do at the Farm & Garden, from the many education programs to organic farming research to healthy school food work, and so much more. Another very pleasant surprise came in the form of an unsolicited \$6,000 grant from the **Agadino Foundation** to support Apprenticeship scholarships in 2014, and an annual contribution of \$1,000 from Jan & Lyn Dash for the Honore Dash Memorial Fund, which has supported Apprenticeship scholarships for the past twelve years.

The **Monterey Peninsula Foundation's** \$52,000 grant will allow CASFS to lead a new healthy school food project with partners in the Central Coast School Food Alliance. This project focuses on eliminating junk food options in and around K-12 schools so as to create a

healthier school food environment in six school districts across three Central Coast counties. CASFS is also receiving support for this project through its partnership with **United Way of Santa Cruz County** as part of their **CA 4 Health grant**.

We are so grateful for these grants and others that came earlier this year, which, along with gifts from individuals, provide approximately one-third of the funding for the work of the Center for Agroecology and Sustainable Food Systems (CASFS) and the Farm & Garden annually. We look forward to acknowledging our many individual donors in an upcoming newsletter, but for now please know how much we appreciate all of your contributions.

Keep Up with Farm & Garden News!

Keep up with the latest news from CASFS/UCSC Farm & Garden by becoming a Facebook friend. Type Center for Agroecology and Sustainable Food Systems into your Facebook search engine and "Like" our page.

And check out the newly designed CASFS website for updates, information and resources: <http://casfs.ucsc.edu>