



**A JOURNAL FROM THE  
GARDEN AT FILOLI**



Rhode Island Greening apples clinging to spurs.

**Fruit Tree Pruning**  
*Part One: Principles of Tree  
Growth and Pruning Basics*

*by Dan Lurie*

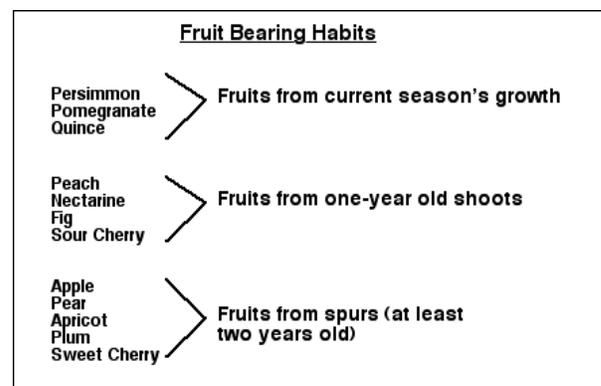
Pruning deciduous fruit trees can be a confusing and daunting task for both seasoned and novice gardeners. In addition to frequently producing impressive amounts of new growth each year, many deciduous fruit trees also have widely differing ways of bearing fruit. Despite these inherent challenges, it remains true that a well pruned and trained fruit tree will have good structure to support its crop, allow air and light to reach fruit, be easily thinned and harvested, and still provide a pleasing aesthetic element in the garden. With a commitment to keen observation of your tree, and an understanding of the basic principles presented in this series of articles, anyone can enjoy the pleasure of fresh, quality fruit from their garden's trees.

There are several elements critical to understanding the right way to prune your deciduous fruit tree. First, accurate knowledge of how different types of fruit trees produce their fruit is necessary. For example, if you were to prune a peach tree the same exact way as a pear tree, you would have plenty of pears to enjoy but few peaches. It is also crucial to understand how a tree responds to pruning and training; this involves an

awareness of the tree's natural growth pattern and how it may be affected by your cultural practices. These important concepts will be presented in this first installment, along with an introduction to the tools and techniques of pruning. The second part in this series will discuss the training of young trees and the third part will cover maintenance pruning of mature trees. These additional articles will also discuss the idiosyncrasies of fruit tree pruning at Filoli.

**How Trees Produce Fruit**

It is worthwhile to pay very close attention to your fruit trees. You should observe them when they are in flower, as the fruit forms, and when they are dormant. You will want to notice which individual trees are particularly vigorous, or perhaps particularly weak, in the size and amount of new growth they produce. Also take note of where on the tree the flowers are formed: if they are along a stem or clustered at the ends of short shoots called spurs, because this is where the fruit will develop. You will start to distinguish between what is vegetative growth (adding to the tree's size and height) and what is fruiting growth (producing flowers followed by fruit).





Fruit tree buds: (from left) apple vegetative bud, apple floral/fruit bud on a spur, and peach triple-bud with vegetative bud (center) and floral/fruit buds.  
*All photos by Alex Fernandez, except where noted.*

Different types of growth on a fruit tree result from different types of buds. When the tree is dormant, you should be able to distinguish between vegetative buds and floral buds. On an apple tree, there is a marked difference between the smaller, flatter buds that exist along the sides of a long new stem (pruning back to these vegetative buds will result in more growth) and the bigger, rounder buds that are at the ends of stems and spurs (these will produce flowers and then fruit). On a peach or a nectarine tree, you will notice sets of three buds along one year shoots. The center bud will produce vegetative growth, while the two side buds will open to flowers, followed by fruit.

Deciduous fruit trees produce fruit in one of three distinct ways. Some trees, like persimmon, pomegranate, and quince, produce fruit on new growth produced since spring of the current year. In other cases, like peach, nectarine, fig, and sour cherry, the trees bear fruit from shoots grown during the previous year. There are also trees, like apple, pear, apricot, plum, and sweet cherry, that produce fruit on spurs, which are short shoots that are at least two years old and can remain on the tree, actively producing fruit for years. The essential difference between these fruiting habits is the **age** of the stem that produces flowers and then fruit.

Trees that fruit on the current season's stems often have fruit late in the year. The new fruiting wood must have a chance to grow before it sets flowers. It is very important to have good structure (well-selected main branches) to support the weight of the fruit crop on a tree that fruits on current season's growth. Other reasons to prune this type of tree include opening the canopy for light penetration; removing dead wood, unproductive suckers and water sprouts; reducing the height to facilitate fruit picking; and encouraging new wood production.

Trees that produce fruit on one-year old shoots often

have sets of three buds. The side buds will flower and then produce fruit, while the center bud may grow into a new shoot having sets of three buds along its sides. In addition to pruning for better light penetration and removing dead wood, unproductive suckers, and water sprouts, shoot-bearing trees should also be pruned to remove last year's fruiting wood which will encourage a continuing supply of new fruiting shoots.

Trees that produce fruit on spurs often take a few years to establish spur growth. These short shoots typically occur at the base of one-year old wood. Once a spur forms, it will produce fruit every year; whereas a shoot-fruited tree must produce new vegetative growth to sustain a fruit crop the following year. Spur-fruited trees should be pruned to encourage formation of new spur growth and allow for air and light to reach the interior fruit.



Plum branch (left) with fruiting spurs and apple spurs (right).

### The Effects of Pruning

One of the most beautiful parts of almost any garden is the presence of a well trained tree, as this represents one of the truest intersections between the desires of the gardener and the force of nature. To work with a tree's inherent growth and fruiting pattern is always easier than to fight against it. Trees want to grow and fruit; understanding a few basic principles of how that growth can be affected by pruning will help the gardener endlessly.

A deciduous fruit tree will put on annual growth that begins in the spring and goes dormant in the fall. As part of its lifelong fight against gravity, a tree will put most of its annual, vegetative growth in an upward direction, towards the sunlight that provides the energy it needs. Part of the process of the tree growing upwards is a quality called apical dominance. What this term refers to is the presence of certain hormones (auxins) that are produced at the tip of a branch and travel downwards, inhibiting side buds from growing into branches. In this way, apical dominance allows the energy of a branch to be focused at the tip, with the result being one long branch with no side branches, particularly near the top, where the auxins are strongest.

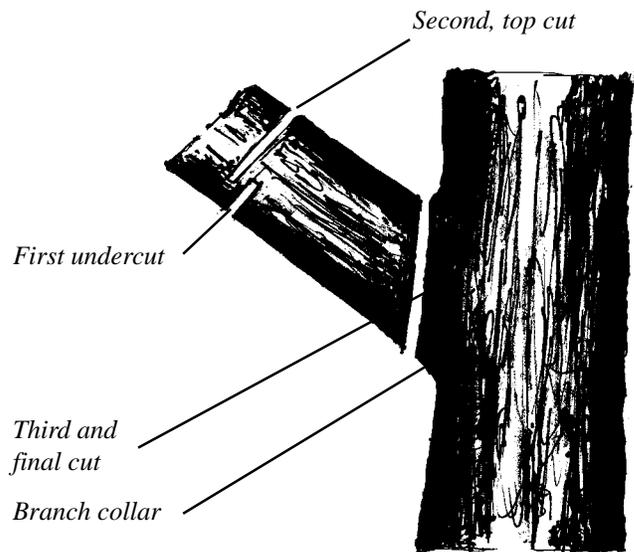
As a branch grows, the apical dominance decreases and the branch will produce its first flowers and fruit. The weight of the fruit often causes the branch to bend over from the vertical; this bending interrupts the apical dominance the tip of the branch was enjoying, and causes many of the side buds to break. In subsequent years this branch would have a lot more fruit than neighboring branches that have remained vertical. Armed with this knowledge, the gardener can bend branches "ahead of schedule" and enjoy an increased crop of fruit—this is the exact rationale behind the method of training known as espalier (see Sundial Times Issue # 31). A horizontal branch will often have an excessive crop of fruit, and put on poor annual growth. Bending branches to 45 degrees from the vertical is recommended for balanced growth and fruit production.

Bending branches is one way to interrupt the apical dominance the tip of a branch is exhibiting over the side buds. Another method is through pruning. If the tip of a branch is removed, the hormone production is interrupted, and the bud immediately below the cut, as well as often the next several buds, will break and grow. By cutting to buds facing in certain directions, and at certain heights, the pruner can decide where and in what direction new growth will head.

### Pruning Cuts

There are two types of basic pruning cuts that a pruner uses to achieve his or her specific goals. A *heading cut* refers to the removal of a portion of a stem. Heading cuts are made by pinching back a tip or pruning a shoot or branch back to a bud, but not to another dominant branch. A plant responds to a heading cut with a cluster of new shoots breaking from buds below the cut and can be used to force a young tree to develop shoots lower on the trunk. Some of these new shoots may be selected for potential main branches. This type of pruning is often used for training purposes and for summer pruning.

A *thinning cut* is when a pruner removes the top portion of a stem, cutting back to an existing lateral branch. A plant's response to a thinning cut is much more controlled than with a heading cut. Fewer, if any, buds will break below a thinning cut; particularly if the remaining lateral branch is large enough-- at least one-third the diameter of the branch being removed-- to assume



Three cut method: branch is removed with the first and second cuts and finished with a final cut outside the branch collar. Drawing by Filoli apprentice, K. Buczek.

the dominant role. Thinning cuts are used to reduce the density of canopies, allowing light into the interior of the tree. Thinning cuts are also useful for removing unproductive or diseased wood or unwanted shoots.

When making a heading cut always cut on a slight angle above a bud. If the tree is still in leaf, there will always be a bud at the base of the leaf (the leaf axil), where the leaf's stem (petiole) is attached to the branch. When removing a large branch with a saw, it is important to first make a cut on the underside of the branch, and then cut through the branch on the outside of that undercut. Make a final cut to remove the stub, but be sure not to cut into the branch collar, a raised swelling that surrounds the branch at its departure from the main stem (see diagram above). Using this *three cut method* to remove a branch will avoid ripped bark below the pruning wound. After pruning, do not apply any sealants to pruning wounds. Sealants have been proven to be ineffective in protecting a tree from disease—it is best to make a good, clean cut and let the tree's natural defenses take over.

### Pruning Tools Used at Filoli

Before pruning any tree it is a prerequisite to have the

proper tools. The following list describes the tools used to prune Filoli's deciduous fruit trees:

*Hand shear and scabbard.* It is essential to have a good by-pass hand shear for cutting branches up to half an inch in diameter. A by-pass pruning shear has a blade that moves along side another metal edge to make a cut, as differentiated from an anvil-type shear where the blade stops against a piece of metal and therefore crushes as it cuts. At Filoli, Felco pruning shears and scabbards are standard among the staff—model 2 is the most popular, but model 8 (slightly smaller and more pointy) is also favored. Whatever hand shears you use, make sure they are **sharp and clean**—dull shears make poor cuts and can cause muscle fatigue or tendonitis. Several hours of continuous pruning can easily dull the edge of the blade. It is convenient to carry a *small sharpening stone* with you to touch up the blade as necessary. You can disinfect pruning blades with a mild bleach solution, rubbing alcohol, or flame. Hot water will help remove sap that collects on the blade and hook. Always be sure to dry carefully after cleaning and oil the blade to keep it from rusting (a light grade household oil will work).

*Folding saw.* A small saw, with approximately a six inch blade, is indispensable for cutting branches from half an inch to three inches thick. The saw blade should also be cleaned and disinfected. Small saw blades are difficult to sharpen, and if dull should be replaced. Folding saws are convenient, and safer to carry—Filoli staff uses Felco model 60 folding saws. Do not use saws intended for another purpose (carpentry, for example). Most pruning saws will cut on the "pull" stroke.

*Tree saw.* A larger saw, with either a thirteen inch blade (a pony saw) or a twenty two inch blade (a swedish or raker tooth saw), is necessary to cut branches over three inches thick.



Basic tools for fruit tree pruning: tree saw, folding saw, loppers, small sharpening stone, and hand shear.

*Photo by Dan Lurie.*

*An orchard, or tripod ladder.* Avoid using a four legged ladder to prune your trees; you will not be stable, and you will not get close enough to the tree. A three legged, orchard type ladder is the only ladder to use outside, working on trees. The third leg may be passed over or through branches, allowing access to all parts of the tree; while the three points of contact form a very stable position. Orchard ladders come in wood or aluminum, and in heights from six to sixteen feet. Aluminum ladders are lighter, and more rigid. You should have a ladder that is an appropriate height for your tallest fruit trees. You may not work from the top of the ladder, so bear in mind that the working height of a ladder differs from its actual height. Also realize you may need help moving and setting up larger (ten feet and taller) ladders. For the average gardener, with fruit trees grafted on dwarfing root stocks, I would recommend an eight foot, aluminum orchard ladder. Always follow all safety directions printed on the ladder.

*Loppers.* Clean-up is an important part of pruning, and loppers can be useful to shorten branches once they are on the ground, perhaps to fit them into your recycling bin. Loppers tend to make poor cuts when used to reach a distant branch, and also when used to cut larger diameter branches. If you cannot reach a branch safely, use a ladder. If you cannot cut through a branch with your hand shears, use a saw. Other clean-up tools include a *burlap* and *wheelbarrow* to carry away cut branches.

*A hat and gloves* should also be included, as should a good *reference book* that lists the fruit bearing habit of your particular tree. *The Backyard Orchardist* by Stella Otto or *Pruning and Training* by Christopher Brickell are good choices.

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*Dan Lurie is the lead horticulturist in the walled garden and the woodland garden. He is also an International Society of Arboriculture certified arborist.*

### **The Sundial Times**

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the ground. After training is complete, yearly maintenance pruning will be needed to control size, and encourage production of fruiting wood from the established framework. The maintenance pruning of established trees will be discussed in part three of this series.

### **Different Training Styles**

At Filoli, we continue to use certain traditional horticultural methods to develop the style and character of plant materials. This methodology influences the training of young fruit trees, whose appearance should reflect the historical landscape period and the training style of extant trees. Thus, all of Filoli's free-standing fruit trees (those not trained as an espalier) are trained with an **open center**, as was practiced at the time when Filoli's orchards were initially planted (circa 1918). The **modified central leader**, a style which may develop a stronger tree, is more typical today in commercial orchards and in home gardens. Both training styles work to develop low fruiting branches and allow for eventual control of the tree's height.

## **Fruit Tree Pruning** *Part Two: Training* *Young Trees*

*by Dan Lurie*

Most young deciduous fruit trees will benefit from training when planted, and during their first three years of life. Training a young fruit tree serves to develop a tree with low fruiting branches, good structure, and strong branch attachments. Low fruiting branches will facilitate thinning and harvesting, while good structure—the arrangement of main scaffold branches—will provide a strong framework to support the weight of future fruit crops, and allow light and air to reach fruit throughout the tree. Wide branch attachments will be stronger and less likely to split than narrow crotches. Forethought and well timed pruning can direct the shape and stability of your young tree in ways that are hard to achieve later—if early training is missed, or done incorrectly.

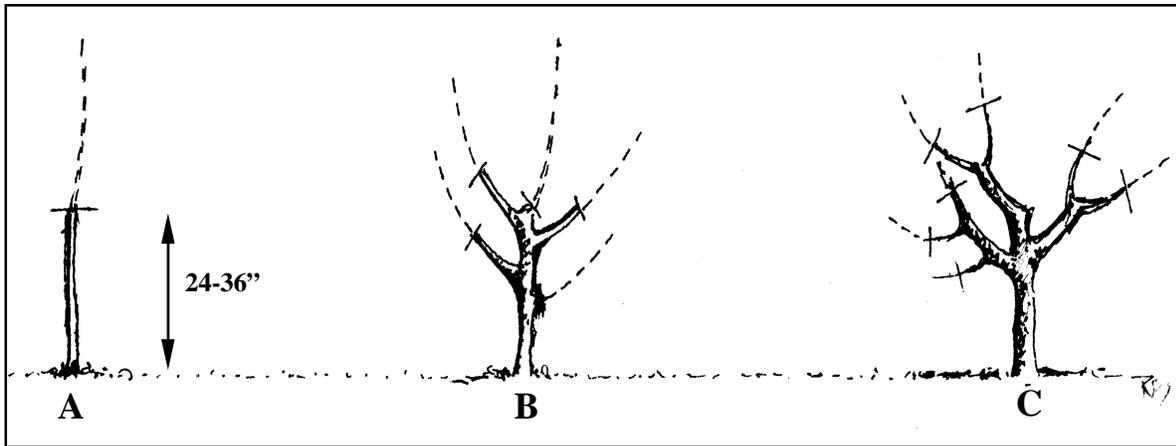
Training young fruit trees involves light pruning performed at planting and during the first three years. Pruning young trees heavily may delay fruit bearing. Training focuses on developing fruiting wood close to



Close-up of short shoots called spurs and fruit arising from secondary laterals of young pear tree.

*Photos by Lucy Tolmach*

## OPEN CENTER STYLE



(A) Heading performed at planting at 24-36"; (B) Pruning during the following winter: three radially spaced scaffold branches are selected and headed back half their length; (C) Pruning during the second winter: new growth on the scaffold branches is cut back half its length, any new shoots growing into the open center are removed.

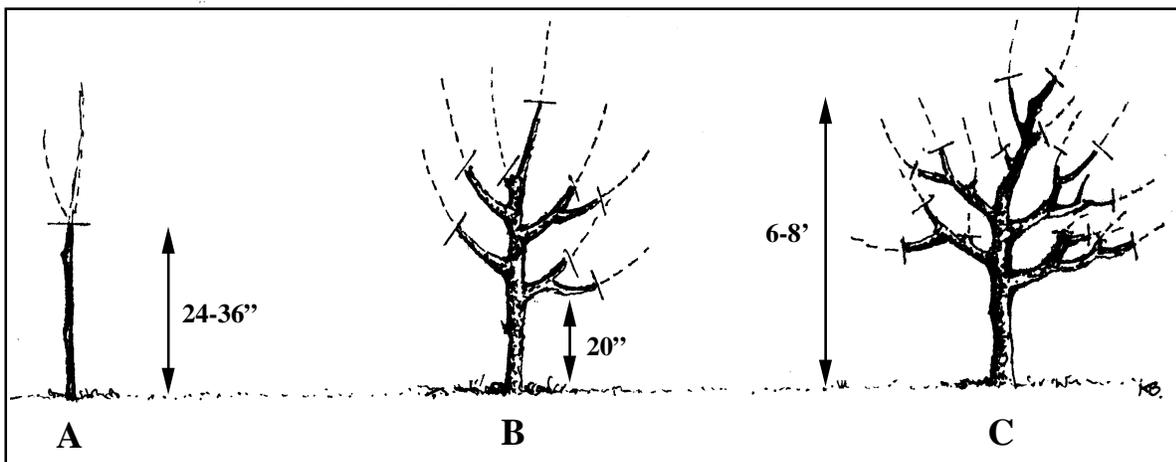
*Drawings by Filoli Apprentice Karolina Buczek.*

The differing growth habits of fruit trees should influence the training style used. Most apple, pear, and cherry trees tend to grow upright naturally and may benefit from training with a modified central leader. Peaches, nectarines, and apricots often grow in a more spreading manner and are usually trained with open centers. It is best to know the growth habits of your young fruit trees ahead of planting time; Japanese plum trees, for example, can exhibit either upright or spreading habits.

### Open Center Style

Open center trees are headed at planting, when the young tree's single stem is cut at 24 to 36 inches above the ground, just over a healthy bud. If there are already side branches, it may be possible to leave a well placed branch (that has a wide angle of attachment) and head it back half its length, otherwise remove all side branches below the heading cut. During the following winter, select three main branches, preferably representing all sides of the tree and at least six inches apart and remove any other shoots, particularly vigor-

## MODIFIED CENTRAL LEADER STYLE



(A) Heading cut is performed at planting; (B) Pruning during the following winter: main scaffold branches are selected and headed back half their length, unwanted branches are removed; (C) Pruning during the second winter: new growth on scaffold branches is cut back half its length, any new shoots competing with the scaffold branches are removed.



Heading response (see arrow at point of cut) of young cherry tree in its first growing season. The following winter only three scaffolds with wide angles of attachment will be selected and others removed.

ous, upright ones with narrow branch angles. The chosen scaffold branches should be headed to half their length—this will encourage the formation of spurs in spur-fruiting trees or fruiting wood in shoot-fruiting trees. The second winter the young tree should be pruned again, this time removing any new side branches that compete with the main scaffolds and cutting back the new growth on the main scaffolds by about half their length. The third winter any new growth on the main scaffolds should be thinned to one outward growing stem, and any stems growing towards the new open center of the tree should be removed. See diagram above left.

### **Modified Central Leader Style**

To train a tree using the modified central leader system, you should also prune the young tree at planting. Head the stem back at 24 to 36 inches above the ground, just over a healthy bud, and then remove any existing side branches. During the following winter, thin the new stems, selecting three scaffold branches that are well spaced on the trunk at least six inches apart and have wide branch attachments—these branches should be headed to half their length, as this will encourage the formation of spurs in spur-fruiting trees or fruiting

wood in shoot-fruiting trees. The topmost branch will take the role of leader, and be allowed to continue upward each year. At about the third year or when a height of six to eight feet is reached, the central leader can be pruned to a strong side lateral, thus slowing down the vertical growth of the tree. See diagram on the previous page, below.

Both styles of young fruit tree training will benefit from light summer pruning. It is useful to observe your new fruit tree the summer after planting, at which point you can see how it responded to the initial heading cut and rub out unwanted growth or branches with narrow crotches or replace weak branches with better ones. Summer is also a great time to use spacer bars to widen the angle of branch attachment. One should always use soft ties that will not harm the bark and recheck often. Some young fruit trees, like Asian pears (see image, next page), produce vigorous shoots that benefit from summer pinching (heading back soft growth by a few inches), which can encourage fruiting branches to form.



This four year apple tree has three scaffold branches. The secondary branches which develop from the scaffolds contain short shoots called spurs where flowers and fruit are born. The main reason for heading a tree to 24-36" is to develop fruiting wood close to the ground within ladder reach which will facilitate thinning and harvesting operations.

## References and Resources

### Books:

*Temperate Zone Pomology*. Melvin Westwood. 1978  
*The Backyard Orchardist*. Stella Otto. 1993  
*Pruning and Training*. Christopher Brickell. 1996  
*The Great Book of Pears*. Barbara Flores. 1999  
(available for \$4 at the Filoli Garden Shop)

### Nurseries:

Trees of Antiquity. Paso Robles, CA (805) 467-9909  
www.treesofantiquity.com  
Apple Art Espalier. Sebastopol, CA (707) 829-2035  
www.appleart.com  
Bay Laurel Nursery. Atascadero, CA (805) 466-3406  
www.baylaurelnursery.com  
Raintree Nursery. Morton, WA (360) 496-6400  
www.raintreenursery.com  
Southmeadow Fruit Gardens. Baroda, MI (616) 469-2865

### Societies:

California Rare Fruit Growers. Westminster, CA (717) 890-1939  
www.crfg.org  
North American Fruit Explorers. Lucernemines, PA  
www.nafex.org  
Home Orchard Society. Portland, OR (503) 293-1468



This Bing cherry was trained in the open center style. Its three scaffold branches were selected 18 years ago.



Some fruit trees, like Asian pears and plums, develop vigorous upright branches. Light pinching during the first and second growing seasons will reduce vigor and encourage lateral branches to grow and to develop fruiting wood.

This article is the second part in a series of three. The first installment was published in the Sundial Times issue number 34: "Fruit Tree Pruning, Part One: Principles of Tree Growth and Pruning Basics." This second installment assumes the reader is familiar with the information presented in Part One. If you've missed this prerequisite, copies are available for a one dollar (\$1.00) fee: Filoli, 86 Cañada Road, Woodside, CA, 94062, Attn: Jim Salyards. Or for more information email: [greenhouse@Filoli.org](mailto:greenhouse@Filoli.org).

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prune, and how to manage the old, neglected fruit trees that many homeowners inherit.

### When to Prune

Mature fruit trees are most easily pruned while they are dormant, during December, January, and early February. The leafless tree is easier to examine; deadwood is more visible and differences in type of bud or growth may be more apparent. Dormant pruning results in vigorous regrowth and the production of watersprouts. A vigorous tree will benefit from summer pruning, which involves removing leaf mass during the growing season to help decrease the vigor.

Summer pruning can start when the new growth is only a few inches long and can continue into the month of June. Later summer pruning provides the most reduction in vigor. Gently pinch new shoots to promote branching (see *Sundial Times* 36). Unwanted growth should be removed entirely; rubbing out sprouts when they are small is better than having to make larger wounds later. Spur-fruited trees will often produce more spur growth if some vegetative growth is removed during the growing season.

Certain diseases are spread during the rainy season. Rainwater spreads many infections, so limiting the presence of new wounds during rainy months can be an effective cultural control of diseases such as *Eutypa* dieback in apricot, *fireblight* in apples and pears, and *leaf curl* in peaches and nectarines. At Filoli, the stone fruits are pruned last even though they are the first to bloom. The chart on page 2 lists the recommended time for pruning of various types of fruit trees.

## Fruit Tree Pruning

### Part Three: Pruning Mature Trees

by Dan Lurie

Deciduous fruit trees reach maturity after the initial training for structure and branch spacing is complete. Mature fruit trees are typically over four years old. They have a clearly developed trunk, 3 to 5 main scaffold branches, and secondary branches producing flowers and fruit. Many deciduous fruit trees are long-lived and will produce fruit for several decades, or even for more than a century, if properly maintained.

Fruit trees must be pruned annually to keep them within ladder height for convenient pruning, thinning, and harvesting. Even trees grown on dwarfing root stock can ultimately grow too tall without regular pruning. Annual pruning will also encourage the renewal of fruiting wood throughout the life of the tree and help prevent limb loss as the tree ages and decays. This article discusses the timing of pruning, how much to



Filoli horticulturist Dave Lesser is seen here heading back the long new growth at the top of a mature apple tree.

Photos by D. Lurie

RECOMMENDED TIMING FOR PRUNING MATURE FRUIT TREES

TYPE OF TREE <small>ORGANIZED BY FRUITING HABIT</small>		DECEMBER/ JANUARY	FEBRUARY	APRIL/ JUNE
FRUITS ON CURRENT SEASON'S GROWTH	PERSIMMON POMEGRANATE QUINCE	PRUNE NOW FOR EASE IN SEEING STRUCTURE AND NEED FOR THINNING		
FRUITS ON ONE YEAR OLD SHOOTS	PEACH NECTARINE SOUR CHERRY		PRUNE NOW FOR DISEASE PREVENTION	
	FIG	PRUNE NOW FOR EASE IN SEEING STRUCTURE AND NEED FOR THINNING		
FRUITS ON ONE YEAR OLD SHOOTS AND TWO YEAR OLD SPURS	APRICOT PLUM SWEET CHERRY		PRUNE NOW FOR DISEASE PREVENTION	PRUNE NEW GROWTH TO ENCOURAGE BRANCHING AND SPUR FORMATION
FRUITS ON TWO YEAR OLD SPURS	APPLE PEAR	PRUNE NOW TO STIMULATE GROWTH AND THIN SPURS		PRUNE NOW TO SLOW GROWTH AND STIMULATE SPURS

be removed.

2. Branches that cross over another or grow towards the center should be removed.

3. Use thinning cuts to remove mature limbs, always leaving the branch collar intact.

4. Use heading cuts on unbranched one year old shoots.

While these rules are important to follow, the habit and vigor of an in-

**How Much to Prune**

General guidelines state that you shouldn't remove more than 25% of a tree's canopy at any one time. While this applies to apples and pears, mature shoot-fruited trees like peaches and nectarines will benefit from the removal of 50% or more of the canopy. Size control is often an issue with vigorous spur-fruited trees and pruning back most of the new growth each year may be necessary.

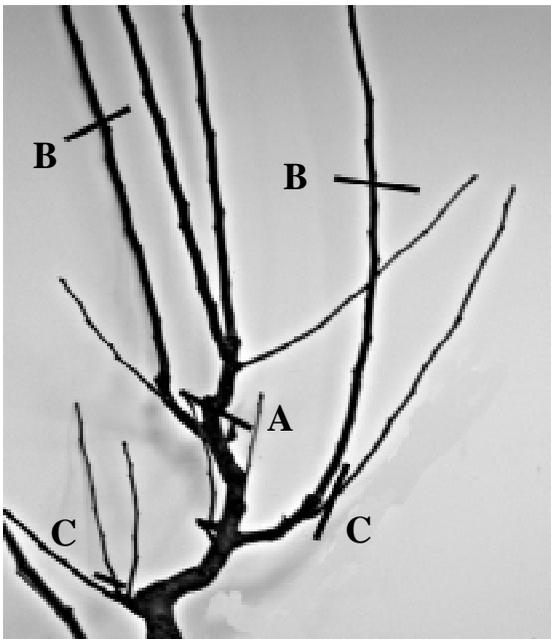
The following basic rules of pruning apply to all mature fruit trees (*see Issue 34 for terminology and techniques*):

1. Dead, diseased, damaged, or weak growth should

dividual tree must always be considered before pruning. Apple trees, for example, are classified by their growth habits as columnar, spur, semi-spur, standard, tip bearing, and weeping. It is important to work with the tree you have: no amount of pruning will change a tip bearing, weeping tree into an upright tree. Likewise, what is considered "weak growth" is relative to the particular specimen being pruned; a similar sized branch on a neighboring tree might be considered vigorous growth.

**Pruning Spur-Fruiting Trees**

Pruning spur-fruited trees, like apples and pears, involves heading last year's vegetative growth, thinning existing spurs if needed, drop crotching



Reducing the height ("drop-crotching") of a spur-fruited tree is shown here. Cut "A" lowers the overall height, while cuts "B" head back new growth, and cuts "C" thin out redundant branches.

branches to reduce height, and removing dead wood. After following the basic rules of pruning, the new vegetative growth produced last year is cut back at least half its length. Watersprouts should be saved where a new branch is needed. Vigorous trees, having already reached their desired height, may require heading back new growth to only a few buds. Thin out redundant and crossing branches. If spur growth is congested it should be thinned by removing old weak spurs. Creating space between fruit buds will spread out the weight of the fruit crop. A good rule of thumb is to leave a fruit bud every three inches. Spur thinning and drop crotching are shown in the adjacent photos.

Some apples and pears are tip bearing and will produce their fruit at the ends of one year old shoots. These trees must be identified by variety (e.g., Rome, Golden Delicious) and pruned differently, thinning new shoots instead of heading them. *See* Issue 36 for resources on identifying the fruiting habit of different varieties.

### Pruning Shoot-Fruiting Trees

Shoot-fruiting trees, like peaches and nectarines, require thinning of fruited branches and spacing of new shoots. Inspect the tree to determine which branches fruited last year, they are often curving downward from the weight of last year's crop. The new straight shoots, produced last year, will bear this year's flowers and fruit. Some branches which flowered last year can be shortened to new laterals that will fruit next year. Other, older fruiting branches should be removed entirely, spacing the remaining branches evenly on the scaffold branch. The basic rules of pruning still apply, and upright watersprouts should be removed unless new growth is scarce. Pruning out about 50% of the canopy of a healthy shoot-fruiting tree is a good guideline, as long as the pruning leaves behind well spaced young branches. *See* photos, next page.

### Pruning Other Fruit trees

The basic rules of pruning can be applied to trees that fruit at the tips of current season's growth (like pomegranate, persimmon, and quince). Maintain an even distribution of scaffold branches, and keep secondary branches from becoming redundant (sharing space with a parallel branch). These trees are best pruned in winter, when 10-20% of the fruited wood can be removed and the tree thinned if it is crowded.

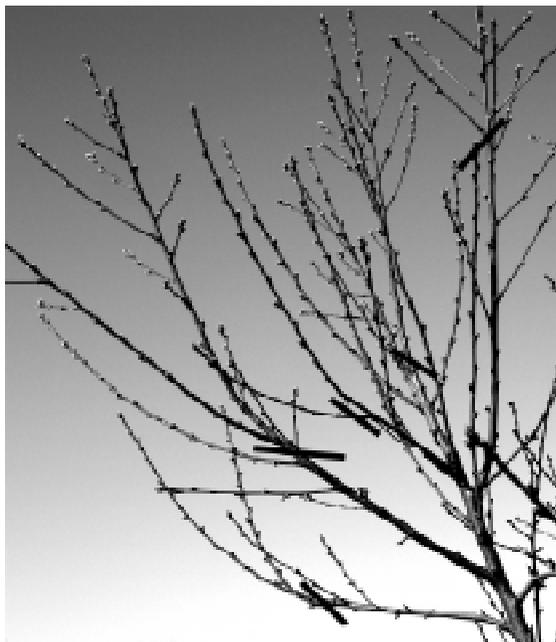
### Old Neglected Trees

Many gardeners in the Bay Area inherit old fruit trees when they move to a new property. Often



Spur thinning is illustrated in these before and after photos of an apple branch.

these old trees have not been maintained for years and are sometimes unproductive. Old, neglected fruit trees are typically very congested and too tall for easy pruning, thinning, and harvesting. Sometimes they have large decay cavities present in the limbs and trunk. These cavities, which reduce the strength of the tree, can contribute to branch and tree failures under the weight of fruit. It is sometimes possible to rehabilitate old fruit trees rather than remove them. The decision to rehabilitate an old tree should be made carefully after evaluating its integrity and strength. It is also important to preserve old fruit trees for their landscape character and their habitat value.



Before and after photos of this mature nectarine show the number and spacing of thinning cuts.

An old, neglected tree will likely have a lot of dead wood scattered through out the canopy. This should be removed in winter when the tree is dormant and the work more easily seen. An old tree may also have congested branches, and branches that have broken or bent to odd angles, perhaps resting on another branch. These branches should be thinned out to let more light into the canopy.

The best method for rehabilitating an old tree is to spread out the pruning work over a period of 3 to 5 years. The first year, remove the dead wood and about one quarter to one third of the branches you identify as redundant or congested—spread the thinning cuts throughout the canopy. Implement a summer pruning program to reduce the vigor of the regrowth. During each of the next two years remove another third of those branches originally designated as unwanted and remove suckers and watersprouts resulting from the previous year's pruning. Care should be taken not to make too many large cuts in one year, or to let too much fruit develop on branches that have decay pockets. The regrowth on apples and pears will be very susceptible to fireblight. Other cultural practices, like watering and fertilizing, should be managed carefully to prevent excessive vigor. In this manner an old tree may be safely brought under control and stimulated to produce new fruiting wood.

### Conclusion

Pruning deciduous fruit trees should be an enjoyable aspect of growing fruit in your garden. The material presented in this series of articles will provide the home gardener with the background infor-

mation necessary to approach their trees with greater confidence. Most importantly, however, is that the grower of fruit trees pays close attention to their trees throughout the year. No amount of reading can replace the direct observation of how your trees grow, flower, fruit and respond to pruning.

*Our apologies for getting this article out so late to our members. We experienced some technical difficulties in changing the newsletter format.*

This article is the third part in a series of three. The first installment was published in the Sundial Times No. 34: "Fruit Tree Pruning, Part One: Principles of Tree Growth and Pruning Basics." The second piece was published in the Sundial Times No. 36: "Fruit Tree Pruning, Part Two: Training Young Trees." This final segment assumes the reader is familiar with the information presented in earlier parts—if you've missed these earlier articles, copies are available for one dollar (\$1.00) per copy: Filoli, 86 Canada Rd. Woodside, CA, 94062, Attn: Jim Salyards. Or for more information email: [greenhouse@Filoli.org](mailto:greenhouse@Filoli.org).

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### The Sundial Times

The Sundial Times is a quarterly supplement to the Friends of Filoli Highlights.

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