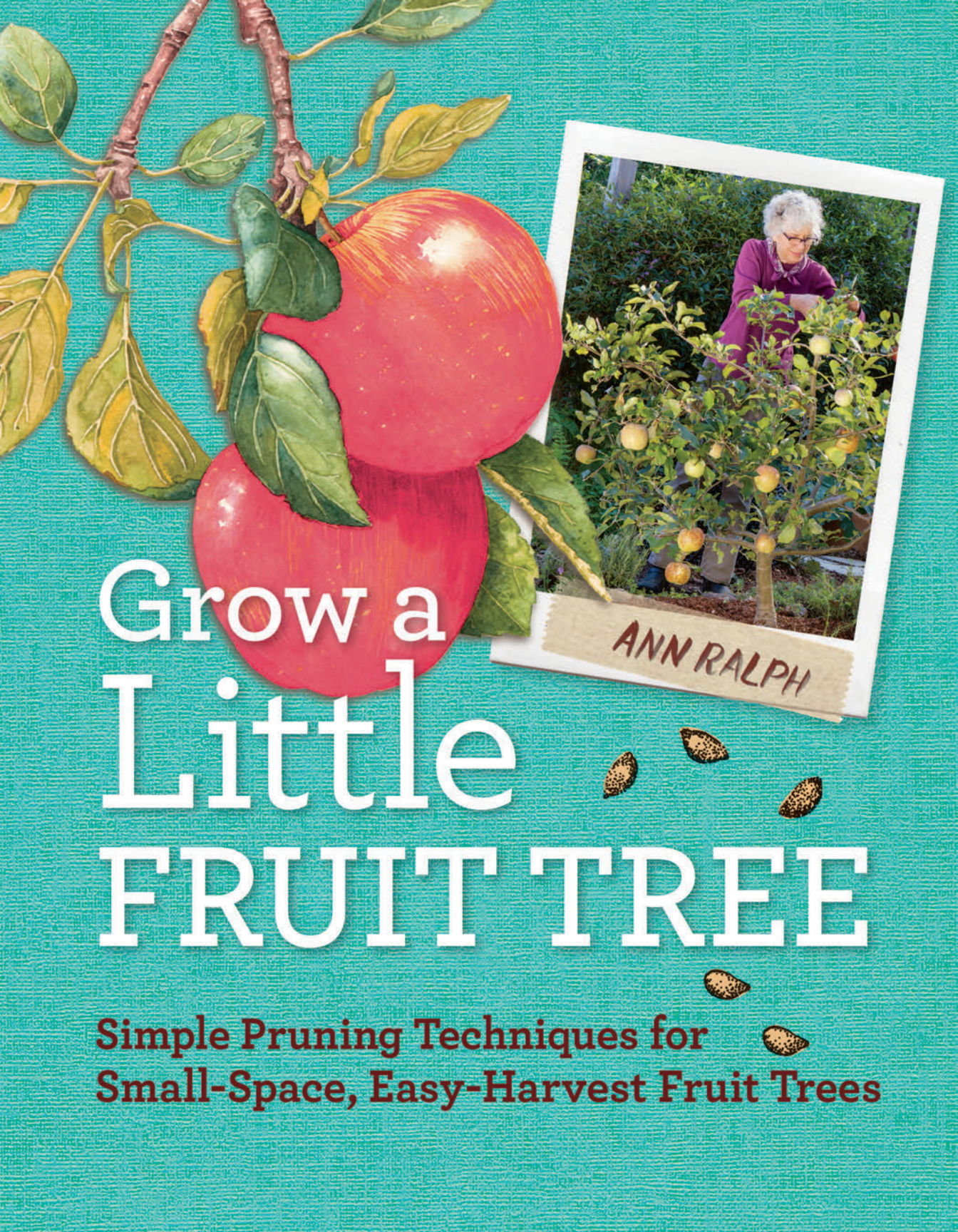

Grow a Little FRUIT TREE

Simple Pruning Techniques for Small-Space, Easy-Harvest Fruit Trees

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ANN RALPH

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Storey Publishing

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The four attributes of Heaven
yuan, *heng*, *li*, and *zhen*:
sprouting, growing, blooming,
and bearing fruit

— **THE COMPLETE I CHING,** translation by Alfred Huang

CONTENTS

"The air here is delicious."

— **E. M. FORSTER,** ***Howards End***

INTRODUCING the Little Fruit Tree

MY FRUIT TREE INITIATION BEGAN AT SCENIC NURSERY IN MODESTO, California. Owner Jim Rogers insisted that no bareroot fruit tree sapling leave the nursery without a pruning cut that took off the top two-thirds of the little tree. Jim wanted happy customers. He taught us that a person who went home with an unpruned fruit tree would soon be the caretaker of a disappointment: a substandard tree, ungainly and erratically fruitful, that would grow beyond a customer's capacity to manage it. The tree would develop into an emphatic reminder of both a personal garden failure and the failure of the nursery to help that customer with what he or she needed to know. Jim was as right about his theories of customer service as he was about the hard pruning cut, but the severity of such a hard prune alarmed me. For the first few seasons, I left fruit trees and this disconcerting task to other workers in the nursery.

Harvests from little fruit trees are bountiful but not overwhelming.

Then one day Ed Laivo, the sales representative and backyard fruit specialist from our wholesaler, Dave Wilson Nursery, arrived at Scenic with some samples of tree-ripe Arctic Glo nectarines. The staff adjourned to the parking lot and surrounded a flat cardboard box on the tailgate of Ed's truck. He passed around slices of a rosy, midsize nectarine from the edge of his knife, its white flesh streaked red and dripping with juice.

When I sampled the tart-sweetness of that astonishing nectarine, I had what I can only call an "in-body" experience. Did time stand still? I think so. The flavor of that nectarine welled in me like, what? How to explain it? Maybe only perfect fruitness, but that was enough. That was plenty.

Human beings were put on earth to eat fruit like this. Fruit that, miraculously and without even too much trouble, could grow in one's own backyard. By that time, I'd learned from my work at the nursery that this fruit, and indeed most fruit, would grow on a tree easily maintained at just my height. I didn't have a lot of space where I lived, but I had to try it. The following January, I bought a bareroot Arctic Glo and beheaded a sapling for myself. Early on, my little tree generated fluffy pink blossoms and, after only three years, it produced five nectarines as memorable as the fruit I'd sampled in the Scenic Nursery parking lot. Ed's sliver of nectarine began my career as a fruit tree enthusiast and emphatic pruner. I've promoted the idea of pruning to create small-scale trees with an evangelical zeal ever since.

WHY LITTLE?

This book offers a revolutionary vision for backyard fruit trees: a simple and ingenious technique that uses timed pruning to keep fruit trees as short as six feet tall. Anyone who has tried to manage a large fruit tree in a backyard situation instantly appreciates the value of the small fruit tree. Little fruit trees require less garden space. They are easy to care for and produce fruit in quantities we're likely to be able to use. Small trees create the opportunity to have more trees in the backyard and to plant different varieties of fruit to ripen all summer, through fall, and even into winter.

Yet, the idea that fruit trees can and should be kept small meets with more resistance than one might expect. People often think there's something wrong, insistently overbearing, and unnatural about controlling a fruit tree's biological vigor. But the very scale of a small tree increases the probability you'll engage with the tree and meet your seasonal

obligations in a timely way. As a result, trees pruned to be small are sturdier and healthier than large ones. Pruning small trees takes very little effort. Thinning overabundant fruit is no trouble at all when you stand on the ground to do it. Obviously, you take better advantage of a harvest you can reach.

Fruit trees are healthier and more abundant, not in spite of what we do to them, but because of it. In *The Botany of Desire*, Michael Pollan contends that fruit trees have used us to advance the fruit tree cause as much as we've used them to satisfy our enthusiasm for fruit. Our relationship with fruit trees is mutually beneficial. When we take better care of fruit trees, when our experience with fruit is a rewarding one, we benefit, and the trees benefit, too, not just as individual trees, but collectively; our interest, attention, and garden space create havens for more fruit trees and for varieties that might otherwise disappear from cultivation.

A UNIFIED FIELD THEORY OF PRUNING

Fruit tree pruning, and any pruning, really, is less of a science than it is a conversation. You prune, the tree answers, you prune again. Pruning is one of the most necessary, neglected, misunderstood, forgiving, and rewarding aspects of fruit tree care. In a very real sense, the hand of the pruner creates a fruit tree, especially one that is trained to be small from the start.

The information contained in this book applies to many plants, but this is, first and foremost, a book about growing backyard fruit trees, specifically deciduous trees — apples, apricots, cherries, figs, peaches, pears, persimmons, and plums — and especially about the training and pruning of trees deliberately kept to a small and manageable size.

Most fruit tree pruning books emphasize differences. Here, I point to similarities. True, deciduous fruit trees are different from one another, and these differences have consequences. Some grow faster; some grow more slowly. Fruit sets on the tree in slightly different ways. Growth habits vary. But for backyard fruit growers, fruit tree commonalities far outweigh these differences. If you learn to prune one fruit tree, if you learn the concepts that drive pruning and how trees react to your actions, in most instances, you can apply the same tactics to all.

Caring for fruit trees is easy when your feet stay on the ground.

Fruit trees need not intimidate gardeners who, too often, guiltily neglect their trees because they don't know what to do. *Grow a Little Fruit Tree* concerns itself with basics, simplification, rules of thumb, and confidence. I hope it will be a first step for people who want to create a small tree for their personal enjoyment or to do right by a tree that already grows in the yard.

This book is not a technical manual — fruit tree management is far less complicated than we have been led to believe. Instead, I intend it as a handbook and encouraging companion — clear, concise, sometimes insistent, practical, and friendly. It proposes a method that will cause most novices (and many professionals) to breathe a sigh of relief.

Grow a Little Fruit Tree represents the culmination of my experience creating small fruit trees for myself and helping hundreds of people to do the same. Twenty years of over-the-counter conversations with nursery customers inform these chapters. I worked for ten years at Scenic Nursery. I managed the fruit tree department at Berkeley Horticultural Nursery for nearly twelve years where I taught fruit tree pruning classes with manager Paul Doty, who gave me the latitude, uncharacteristic in the industry, to buck conventional fruit tree pruning wisdom.

Much of the information presented in this book draws on local examples from the San Francisco Bay Area and the San Joaquin Valley in Central California. With some adjustment in terms of timing, variety choices, and good advice from your farm advisor or local independent nursery, the basic rules apply in whatever region you call home.

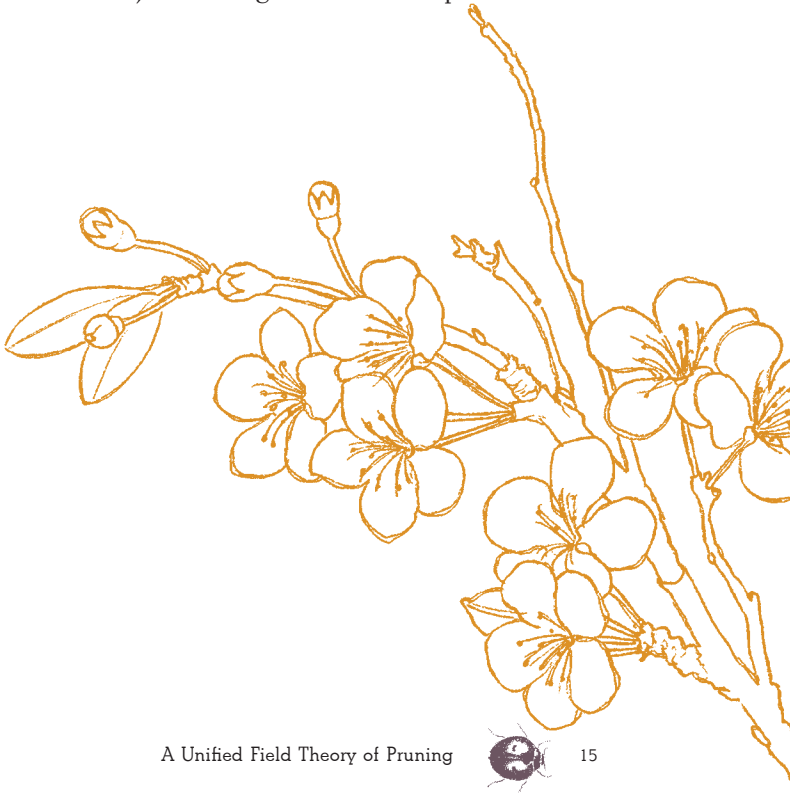
One More Thing

Produce has become a commodity, divorced from region and season, more like detergent and toilet paper than anything timely, vital, and alive. Even at the nearest natural foods co-op, forty miles away from where I live, much of the produce comes from the same wholesaler my local market uses. The nearby farmers' market, while the best thing going, is more of a scene than it is a reliable food resource. It closes down in October and doesn't reopen until June. The unbearable irony is this: people who live remotely from food havens in urban centers and college towns, even if they live in areas where food is grown, have a nearly impossible time getting decent fresh produce unless they grow it themselves.

When appearance and shipability become the most important qualities of the fruits and vegetables we eat, what have we lost? Flavor, nutrition, and variety, to name a few things. These losses have consequences. When food isn't satisfying, we treat it like fuel. We have abundance, but not enthusiasm. We cook less. We eat standing up over a sink or sitting in front of a television or computer screen. We don't share meals with one another. We omit fruits and vegetables from our diets entirely. And why not? If food isn't tasty, why bother to prepare it?

This chain of mostly unconscious conclusions affects our health and our social interactions. Sadder, I think, is the flattening effect of a world with bland strawberries year-round, rather than delicious, seasonal strawberries to look forward to. Much of the specialness of fruit derives from its seasonal nature. Gone is the thrill of waiting for those peaks when the flavor-of-the-week gluts the market — cheap, plentiful, and at the top of its form.

The good news is that, thanks to the grocery store, we no longer have to depend on our varying abilities to provide food for ourselves. We can grow food for pleasure. Homegrown fruits and vegetables taste good. They're packed with nutrition, abundant, and right at hand. Homegrown food returns the seasons to the dinner table — seasons that can be stored in the freezer or turned into jam. Homegrown food exemplifies attention and care.

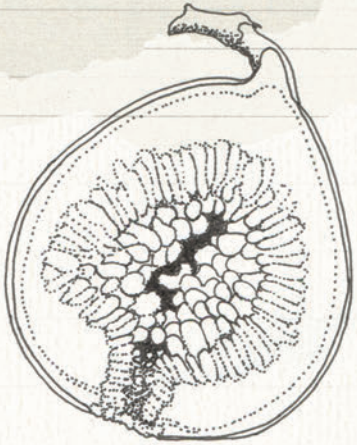


CHAPTER 1

SMALL IS BEAUTIFUL

"Why not go out on a limb?
That's where the fruit is."

— WILL ROGERS



AT HEART, WE ARE STILL A NATION OF YEOMAN FARMERS. We owe our American backyards in part to Thomas Jefferson, who believed that small property holders with modest farms held a stake in the new republic and so propelled it forward. Citizens care for what belongs to them. As we build our lives to suit our needs and inclinations, we look to the future and to the health of the wider community. Small is a big idea. After World War II, this simple principle — that people invest in and build on what they own and know — led to Federal Housing Administration home loans, the GI Bill, and the greatest expansion of the middle class in our economic history.

When home gardeners borrow tactics from farmers, they get more than they bargained for – outsized trees and impossible quantities of fruit.

In this context, the American backyard and its attendant fruit tree reside firmly in our national DNA. No wonder we find home ownership, backyards, and fruit trees so irresistible. Walk around most established neighborhoods and you're likely to spot a fruit tree in almost every backyard. Count the fruit trees in your own neighborhood.

We create our Edens in any corner we can find. If we don't have land of our own, we borrow some. We establish community gardens. We find a place for a fruit tree to put down roots, even if we can't manage to put down roots of our own. When we plant these trees, we dream of harvest and self-reliance. We want to free ourselves from pesticides and chemicals, and we want to control at least some of what we eat. We plant for flavor and quality, for fruit that tastes like the fruit we remember, or the rumors of fruit we've heard about from people who are old enough to remember. Perhaps most important, we plant for a simple and elemental domestic satisfaction — the singular pleasure of harvesting and eating food we've grown ourselves.

TOO MUCH TREE

Let me begin by stating the obvious: a small fruit tree is easier to care for than a large one. One of the best reasons to keep fruit trees small is that big trees are so hard to care for. Big or small, most deciduous fruit trees need a few annual attentions to stay well-formed, healthy, and capable of producing and bearing fruit. Fruit trees require pruning twice a year. Fruit will need to be thinned and harvested. Pests and disease, if present, might need mitigation. None of these tasks is inherently daunting. In truth, these simple chores provide much of the pleasure of attending to a fruit tree.

The difficulty of seasonal routines, however, grows exponentially with the size of the tree. Pruning a small tree takes about fifteen minutes. Pruning a twelve-foot tree probably requires professional help at professional prices, and not just once or twice, but every single year.

Why, then, did we learn to manage fruit trees and prune the way we do?

Pruning a small tree takes about fifteen minutes. Pruning a twelve-foot tree probably requires professional help at professional prices.

Two centuries of industrialization changed the character of farming, and fruit growing was no exception. Tree size, spacing, and alignment adjusted to accommodate farm machinery. What we think of as classic fruit trees — the fifteen-footers — were winter pruned when the trees were dormant and a farmer had time to do it. Pruning trees to have open centers instead of a single "leader" allowed sunlight to penetrate the interior branches of trees that were shaded by an orchard around them. In the late 1940s, chemical pest control and soil enhancement with chemical fertilizers came into vogue.

These rote practices relied on machines and schedules to keep Nature in line. They promoted maximum size for maximum yield. Farmers need the yield on which their livelihoods depend. But when home gardeners borrow tactics from farmers, they get more than they bargained for; namely, outsized trees and impossible quantities of fruit. Most backyard growers don't have the space or equipment to manage commercial-size trees, and even if they do, from pruning to harvest, the work these trees require overwhelms even the most dedicated family orchardist.

Old-fashioned fruit trees command garden space like, well, trees. Planting any tree in a small garden is not a step to be taken lightly, and fruit trees are no exception. Even if

kept to only twelve feet — a tree that is twice as tall as you are with the crown of the tree at an equal spread — fruit trees create a substantial presence in the urban or suburban garden. The late and essential Henry Mitchell, *Washington Post* garden writer and author of *The Essential Earthman*, wrote in his essay "Bad Trees and Good Trees" that trees belong "in gardens in *extremely limited numbers*." The italics are his. He makes a crucial point. Sun is worth preserving in a garden. People generally underestimate the ultimate size of a tree, a tree's capacity to crowd its neighbors, and the amount of shade and debris that trees usually produce.

Many modern farmers now adopt the logic of growing smaller trees. The classic vase-shaped orchard tree is rightly and rapidly disappearing from commercial orchards for the same reasons it ought to disappear from our backyards: big trees are hard to care for. When you drive past orchards these days, you see short trees of all varieties planted in close proximity. What farmers do is only partially relevant to the home gardener, however. Home gardeners have different purposes from farmers, and different rules apply.

TOO MUCH FRUIT

In most cases, reducing fruit production in a backyard tree is an excellent idea. People often radically underestimate the fruit-producing capacity of the average-size fruit tree and overestimate the amount of fresh fruit they actually use. A realistic appraisal of your fruit consumption is an excellent place to begin. Consider this: a twelve-foot apple tree — remember, that's a small one, twice as tall as you are — can easily set fifteen hundred to two thousand apples.

To thin the fruit, you need to climb high into the tree. This fruit thinning will take a good bit of your spare time, if spare time is an option you can entertain. But let's say it is, and you do. Apples usually set four to five fruits per cluster. You reduce the clusters to one apple each and bring your crop down to, say, six hundred apples. That's six hundred Fujis ripe right around Thanksgiving.

Now, apples that fall to the ground may still be edible, but only if they have a soft landing. Collecting apples before they drop means climbing high into the tree again, over about a three-week period. Okay. You lose some apples to birds and codling moth. You're diligent, though, and a member of a family of four. Let's say you collect most of the remaining apples. A best-case scenario gives each person in the family one hundred

and twenty-five apples apiece to use as he or she chooses, or about three per person each day over a period of two months.

Fujis are basically a single-use apple. They're terrific, especially homegrown, and, as the apple people like to say, great for eating out of hand. They're good keepers, too, meaning that their quality holds up well if you store them in a cool place like the basement or garage. To my taste, they're a bit sweet for alternative uses like baking and applesauce. With one big tree, though, you have nothing but Fujis. You probably want to use them fresh. The people at your place of work will be happy to see you coming in with bags full of tree-ripe apples.

However, the more likely scenario is that you collect about sixty to a hundred smallish apples from the lower parts of the tree because you never got around to thinning them, and the crop remaining will fall to the ground to bruise and rot. You harvest low-hanging fruit, but midway through apple season, you tire of reaching higher and higher into the tree. The apples you don't pick fall to the ground, creating an even worse codling moth problem next year as the caterpillars reproduce in the fallen fruit. Saddest of all, exasperated by these unending demands, when apple season is past, you're happy to see it go.

One of my colleagues, Jean-Marie, told me of an ancient apple tree in his in-laws' backyard in Utah. The tree had been neglected. Over the years, it grew to twenty-five feet high with an oaklike trunk, as tall as the sycamores that line streets of old downtown neighborhoods. Jean-Marie said that every October overripe apples, too far out of reach for harvest, rained from the tree with such force they exploded as they hit the ground. You could hear the explosions from inside the house, he said, where you safely retreated from the bombing fruit and the consequent mess and stench of hundreds of rotting apples lying worthless on the ground.

From a twelve-foot, thirty-year-old Golden Delicious apple tree in Richmond, California, my sisters fill the green bin three times every harvest season with wormy windfalls they can't possibly use. They employ a long-handled tennis ball tosser called a Chuckit! to retrieve the apples from the ground, but this apple retrieval is still a huge job. If you have a troublesome tree like this, you can reduce the amount of fruit set by spraying the blossoms with water from the hose while the tree is in bloom. This halts some fruit production, but the tree still requires pruning and care. Nor does it address the problem of managing the fruit that remains.

Use It or Lose It

Ripe fruit also expresses a very real urgency. Stone fruits like apricots, peaches, and plums have a much higher urgency score than apples. Most fruit crops tend to ripen all at once and not necessarily on a schedule that accommodates a busy life. In summers, my dad graded peaches to supplement his teacher's pay. Free peaches came with the job. I well remember my mother's misery, the swamp cooler blowing down the hall in the heat of August, as she worked morning to night for several days to can quarts of peaches before they went bad in the lug box.

And as much as we might like cobbler, how many of us are really prepared to process and clean up after a thousand dead-ripe apricots? One June, when I was a college student in Fresno, roommate Luann and I, short of funds, cooked apricots from a backyard tree every way we could think of, short of canning. We made pies, cobblers, syrup, quick breads, crisps, and jam. We used maybe an eighth of the crop and made ourselves sick in the process. The remaining apricots turned into a stinky, gooey, insect-laden fruit tar as they dropped and coagulated underneath the tree.

Proper pruning doesn't just keep trees small; it limits crop size to fruit you will actually use. Home gardeners typically do better with reasonable amounts of fruit.

Fruit gone to waste is a heartbreaker.

DWARFS AND SEMIDWARFS

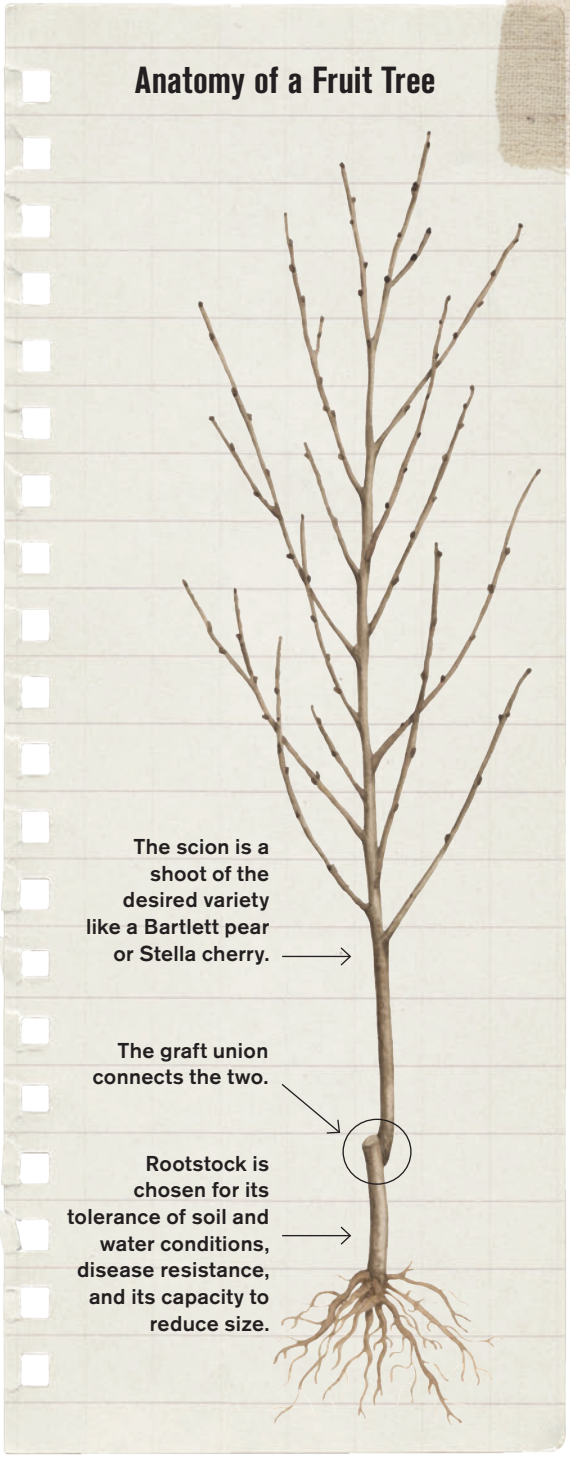
Most nurseries offer fruit trees grafted (see A Brief Glossary, page 158) onto *semidwarfing rootstocks*. I give closer attention to rootstocks, grafting, and rootstock selection in chapter 2; just note here that dwarfing potential is the *least* important thing about a rootstock. People seek out fruit trees on semidwarfing rootstock with reasonable expectations of smallish trees. How mistaken they will find themselves to be.

While somewhat smaller than standard-sized fruit trees, many of these so-called semidwarfs grow rapidly to be at least two stories tall, three times too tall to be managed by the average five- or six-foot person. Fruit trees sold as semidwarfs require pruning for realistic size control. In fact, the term "semidwarf" is so misleading I wish I could drop it from my fruit tree vocabulary entirely. Semidwarf means only "smaller than standard." If a full-size fruit tree is thirty feet tall, then a semidwarf might grow to be as high as twenty-five.

In contrast, *genetic dwarf* trees have their short stature bred into their genetic makeup. Genetic dwarfs aren't grafted like semidwarfs. They grow on their own roots. On average, they stay between six and eight feet tall. When you breed a fruit tree for one quality, such as size, then other traits like fruit flavor and overall vitality become necessarily secondary. My dad planted a dwarf peach that grew to four feet tall with an elegant weeping habit. It produced stunning double pink blossoms, followed by fruit so bland and mealy that nobody bothered to eat it.

While a few genetic dwarfs produce fruit of admirable quality, they don't offer much in the way of choice varieties or climate adaptability. There's no such thing as a dwarf greengage plum, for instance. In addition, a dwarfed root system tends to compromise the overall health and longevity of the tree. A genetic dwarf variety of apple called Garden Delicious produces spritely fruit, but the tree lives only twelve to fifteen years.

Some fruit trees are available grafted on *ultra-dwarfing rootstock*. These trees stay quite small, four to six feet, but because of their extremely small root systems, ultra-dwarfing rootstocks present many of the same problems genetic dwarfs do in terms of short life and overall plant health. Bigger root systems make for healthier plants and better anchoring. Ultra-dwarfs require permanent staking so they don't tip over.



JUST RIGHT

You don't need to buy dwarfs or ultra-dwarfs if you want small trees. Europeans have used pruning to keep ordinary fruit trees small for centuries. Take a visit to a historic garden in the United States, and you will discover that our own Founding Fathers often kept their fruit trees small. Once you understand the simple logic of pruning, keeping a fruit tree appropriately scaled is easy enough to do. In fact, regular pruning is the best way to control the size of a fruit tree.

Whenever I give a pruning talk, I repeat that statement to make sure nobody missed it, and so, here too, once again: regular pruning is the best way to control the size of a fruit tree. When tree size is a factor you control with pruning, your options change entirely. You can base your fruit tree selection on the single most important criterion — the desirability of the fruit. Resolve the size issue and one key issue remains: What kind of fruit do you want to grow?

Any type of deciduous fruit tree responds to the keep-it-small pruning treatment — the oldest heirloom or the most recent introduction. Choose whichever variety of apricot, apple, cherry, fig, quince, persimmon, plum, or pluot — a plum-apricot cross — is most ideal for your palate and your climate. Keep it

small. Put away the ladder. You can plant more trees than you planned to, either singly around the garden, or in a hedgerow along a sunny fence, or even three little trees closely spaced and pruned to grow apart from one another (three fruit trees together where you thought you had room for only one). You can work fruit trees into an existing landscape. You can accommodate favorite fruits that need another tree for pollination. With attention to ripening times, you can harvest fresh fruit *in reasonable quantities* from your garden from late spring well into winter. Factor in citrus if you live in a citrus-friendly climate, and you can harvest fresh fruit from your garden year-round.

Regular pruning is the best way to control the size of a fruit tree.

How big should you let a fruit tree grow? And make no mistake, your fruit tree will grow if you do nothing to stop it. People are essential players in any fruit tree equation. Tree size is entirely your choice, of course. You can have a big tree if you want one, and the work that goes with it, too. To my mind, though, human-size trees are a better fit for both the garden and the gardener. Ed Laivo puts it this way: "A good height for your fruit tree is as tall as you can reach while standing on the ground."

A FEW WORDS ABOUT CITRUS

In the 1950s, my parents planted a Meyer lemon hedge in front of our Modesto ranch-style house and pruned it square. For as long as I can remember, we harvested fresh lemons from the front yard most of the year. Ripe fruit held reliably on the plants through the bloom cycle and almost as long as it took for the new fruit to begin to ripen again near Christmas. One of the advantages of life in a Mediterranean climate is the luxury of citrus in the garden.

Citrus is an evergreen tropical that doesn't require an initial hard prune or routine pruning the way deciduous fruit trees do. It grows as a large, round fruiting shrub. Dwarfing rootstocks work well with citrus. In fact, citrus became a temperate-climate garden staple because of the success of dwarfing rootstocks. Standard-size citrus trees can get much larger, twenty-five feet high and as wide, and make, to my mind, a difficult proposition for a backyard plant.

Prune citrus if you want to. Shape citrus as you see fit. My parents' Meyer lemons would have easily grown as tall as ten feet had they been allowed to do so.

How Tall Is Tall?

For some reason, plant height confuses nursery shoppers. The yardstick of your own body should logically give you a sense of how tall things grow, but it doesn't seem to work this way. The phenomenon is so common that it clearly has something to do with perception and not general cluelessness. Say the sign in a nursery says a plant grows to be eight feet tall. Most people take that information to mean that the plant gets to be a little taller than they are, whether they stand at five foot four or six foot seven.

Plant buyers need also bear in mind that, usually, when a plant grows to eight feet tall it develops considerable spread. Even people who have a reasonable idea about scale in their own gardens buy an unassuming plant in a one-gallon container, take it home, and set it two feet away from the fence, where it quickly overcrowds its designated space. From long experience, I know better, and yet, I *still* do this.

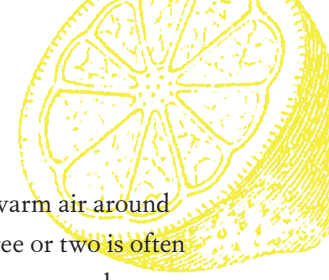
The problem was so widespread and severe, we posted signs around Berkeley Horticultural Nursery that marked heights at eight, ten, and twelve feet, so that customers would have some idea of what they were in for when we pulled a skinny little sapling from the bareroot bin. Some of my most important work in my many years of nursery employment has been not so much in providing plant information, but in pointing out height – ten feet is as tall as that eave. Once you get a real look at twelve feet, fifteen feet is quite a shocker. To compound this confusion, those of us in the nursery industry call a tree that grows to fifteen feet high "a small tree."

The term "dwarf" also baffles plant buyers. Many people believe that a dwarf tree grows to the height they have in mind for it to grow. Most think a dwarf plant is very small, topping out at maybe two feet. Indeed, some dwarf plants do stay this short. Nevertheless, the term "dwarf" really addresses issues of scale when compared to the general species. Varieties of *Acer palmatum*, for example, the dwarf Japanese maple, grow anywhere from four feet to twenty feet tall. They are classified as "dwarfs" because of their thirty-foot-tall cousins.

A good height for your fruit tree is as tall as you can reach while standing on the ground.

When choosing citrus for planting, pick dwarfs that grow anywhere between eight and twelve feet tall, depending on variety. If you want to prune a citrus tree to correct the shape, summer is the time to do it. The evergreen foliage on citrus affords them frost protection that you don't want to remove in winter. As described in chapter 3, ordinary heading and thinning rules apply. When pruning, be aware that the shrubby growth habit of citrus and its canopy of leaves protect tender bark from sunburn.

Once established, citrus in citrus regions manage some frost without much trouble, especially if the trees grow in protected locations like courtyards, or on the south side of the house. Every few years a killing frost rolls through some moderate climates. Damage from these frosts worsens dramatically when they follow a drought. Moist soil is a frost-tender plant's best protection against bitter cold. If you learn of the possibility of an extreme frost, check soil for moisture, especially if it hasn't been raining. Water if you need to.



When covering a plant to protect it from frost, the idea is to trap warm air around the plant as it rises from the ground. A temperature increase of a degree or two is often enough to keep plants from sustaining enough damage to kill them. Some people warm up their citrus by decorating them with Christmas tree lights. If the weather pattern is severe enough, you may want to harvest fruit so it doesn't freeze.

Plant citrus any time of year into unamended garden soil. Evergreens don't have a hard dormancy the way deciduous trees do and, because of this, are not available bare-root. Top dress with at least two inches of mulch fortified with chicken manure — like other fruit trees, citrus prosper with an application of mulch. In some regions, frost protection for the first three winters while the tree establishes itself is a worthwhile precaution. Cold hardiness varies within the citrus family. Mexican limes are far more frost tender than mandarins, for instance; and some, like grapefruit, have a greater need for heat. Check with your local nursery.

Citrus is a good choice if you must plant fruit trees in containers.

Provide citrus with regular deep watering, about once a week, especially early in the season if the rain stops and as the tree is flowering and setting fruit. Applications of fertilizer and mulch, or manure-rich soil amendment used as mulch and refreshed once a year, will improve the health of the plant, its frost resistance, and the quality of the fruit.

DIFFERENT STROKES FOR DIFFERENT FOLKS

A fruit tree's job is to produce an adequate supply of fruit, *adequate* being however you define it. My adequate can be forty. Your adequate might be two hundred. In spite of what you may have read, a fruit tree doesn't need to look a particular way to accomplish the goal of meeting your needs, production-wise. Personally, I like a little elegance in my fruit trees, an occupational hazard of being an art major, I suppose. This proclivity is merely the way I think about things and has no real bearing (so to speak) on fruit production. Not everyone adopts this aesthetic, or needs to.

How Much Fruit Is Enough?

Steve Detherage worked with me at Scenic Nursery in Modesto. His grandfather was a farmer who, late in his life, lived alone on some acreage in California's Central Valley near the town of Ceres. He kept a peach tree on the property long past its prime. Peach trees usually last only about twenty years. This tree was easily years past that. Over

many seasons, the weight of the fruit cracked off most of the branches, one after another, until one last limb remained. This decrepit, lopsided tree bothered Steve a good deal.

"I work in a nursery, Grandpa," Steve said. "I can get you a new tree."

"No, thanks, son," his grandpa replied. "Every summer, I get about eight peaches, which is as many as I care to eat, and every year, those peaches taste as good as any I ever had."

We would be wise to abandon our conventional ideas about fruit trees and adopt this practical way of thinking. There are all kinds of ways to build a functional tree. My aunt Doris grew a Frankenstein's monster of an apple tree in her backyard. The tree was at least thirty years old. Son Dan Nelson, a nursery wholesaler, took a chain saw to the tree when it got out of hand. Today, it looks like a giant slingshot with many horizontal fingers emanating from the ends of each fork, each finger a different variety, the grafting accomplished over a number of years. While hardly traditional, it serves a useful function: one tree, many varieties, a long fruiting season, and all within reach.

Dan is the first to say that the chain saw approach was a necessary consequence of overgrowth and neglect. There are "better" ways to prune trees, of course — methods that the tree can more easily manage. For one thing, small pruning cuts heal more readily than large ones. Timely and regular pruning creates more handsome specimens. Dan freely admits there would be more fruit if he "tried harder." Still, I couldn't imagine a better fruit tree for my ninety-five-year-old aunt and her purposes: Gravensteins for applesauce and pippins she could reach for her legendary pie.

Tree or Shrub?

One last odd example, a Santa Rosa plum, grows in the demonstration garden at Dave Wilson Nursery. Actually, this tree can't be called a tree at all. It's a four-by-four-foot fruiting deciduous shrub — bushy and flat-topped. It looks like any shrub you'd shear with hedge shears. In fact, it came to grow this way with aggressive shearing, an experiment to see exactly how far it was possible to push the small fruit tree concept. Pretty far, as it turns out. This fruit machine cranks out about two hundred and fifty plums per season, enough to provide all the Santa Rosa samples needed for Dave Wilson Nursery fruit taste tests.

CHAPTER 2

the SHORT FRUIT TREE METHOD

"... one of the latest improvements has been to blend the useful with the agreeable."

— **THOMAS WHATELY,** ***Observations on Modern Gardening*****, 1770**

EVERYTHING POSSIBLE IN A BACKYARD FRUIT GARDEN grows from a short and manageable tree. When fruit trees are kept small with summer pruning, you can have one small tree or many. You can work fruit trees into sunny places in an existing garden. You can plant any variety you choose and keep it small. You can plant isolated trees. Or, you can plant trees in close proximity, as near as eighteen inches apart. Doing so provides you opportunities for more variety, lengthens your fruiting season, and enhances pollination.

Ed Laivo demonstrates the little fruit tree technique at the Dave Wilson Nursery experimental orchard.

Small fruit trees keep your feet on the ground. You rarely need tools beyond shears, a handsaw, and maybe loppers. Regular pruning creates fruitful and healthy fruit trees. Their small size simplifies pruning and care. Fruit trees pruned consistently winter and summer from their youth are never the headache their larger counterparts can be.

The central feature of the short fruit tree method is simply this: summer pruning near the time of the solstice in June best controls the size of a fruit tree. The method abandons the erroneous notion that semidwarf rootstocks offer much value in terms of size control.

Semidwarfing rootstock is a misnomer at best. No matter how you name them, semidwarf fruit trees aren't small the way we tend to think of small — a tree roughly equivalent to our own height.

Fruit trees grafted on semidwarfing rootstock aren't carefree, either, a common and regrettable misconception. Like standard-size fruit trees, semidwarf trees require routine pruning. If left unpruned, these trees quickly grow beyond our capacity to manage them. In addition, remember that if a rootstock has the capacity to keep a tree smaller than six feet, the root system, by its nature, is less than adequate for the task of keeping a tree upright and healthy. The value of rootstock resides in its vigor, disease resistance, water or drought tolerance, and ability to encourage a fruit tree to bear at a young age, a trait called "precocity."

If you want a small fruit tree, pruning is the best way to make one. The resulting tree will be shapely, healthy, fruitful, and easy to care for. The essence of the short fruit tree system couldn't be more straightforward: solstice prune your fruit tree to keep its size in check. There are nuances, of course, detailed in the pages to follow, but the method is simple. Nothing this book contains is beyond the aptitude of an ordinary, attentive home gardener.

THE BUTCHER PRUNER

In the late 1970s Ed Laivo worked as a manager at the Urban Tree Farm Nursery in Santa Rosa, California. He began to develop the short fruit tree system as part of his own all-edible garden. Like the rest of us, he planted semidwarf fruit trees because he lacked the space for big trees. He didn't want to manage them, either. He found himself in an ongoing battle with trees of all varieties, some growing faster, some more slowly, but all the same, trees that emphatically refused to stay small.

He chose his fruit trees for the semidwarfing properties of their rootstocks. Yet, these rootstocks consistently and abysmally failed to reduce the size of his trees. When he responded with aggressive pruning the traditional way, in winter, this fact became undeniable: winter prune a fruit tree on semidwarf rootstock, and that tree will only grow larger. Ed's frustration with these so-called semidwarfs was extreme. The size problem revealed itself again and again as he worked as a nursery buyer at Yardbirds Home Center in Vallejo, California, and Oki Nursery in Sacramento, California. The trees didn't perform as advertised.

Aggressive Pruning

When he was growing up, Ed watched his grandfather prune orchard trees. His grandfather was an aggressive pruner who kept his trees at about ten feet tall, several feet shorter than the standard orchards of the time. But that wasn't really it, Ed said. Stan Bradberry, the owner of Urban Tree Farm, instilled in Ed a questioning attitude. He nurtured Ed's regard for the value of an open mind when considering established horticultural practices. Like many good ideas, Ed's technique developed intuitively as he worked with his trees. If winter pruning didn't control the size of fruit trees, maybe summer pruning would help.

As a rule, we tend to think of vigor as desirable. Ed knew that summer pruning decreased vigor. In the case of fruit trees, though, it's advantageous to curb aggressive growth habits and create sturdier trees. In addition, fruit trees are so overgrown and ungainly in summer, they seem to want pruning. As it turns out, a summer reduction of this excessive vigor is also a great way to keep fruit trees small.

Ed's inclinations "just seemed right," he says. They "made sense." Friends dropped by to monitor his pruning progress, and they gave him a hard time. He became known as the "butcher pruner." He worked with friends and colleagues to test and evaluate his developing theories. Impressed with the results, many thought his idea was too good to stay confined to his backyard. They encouraged him to write a book.

Enter Dave Wilson Nursery

By the time Dave Wilson Nursery hired Ed as a sales rep in 1992, he hated selling trees on semidwarf rootstock. These trees were bound to confuse and frustrate nursery customers. The rootstocks came with other problems, too — shallow rooting, suckering, poor anchoring, and limited disease resistance. Ed wanted his customers and, by extension, their customers, to have satisfactory fruit tree experiences. The behavior of semidwarf rootstocks made this nearly impossible.

With Dave Wilson Nursery's backing, Ed began what he calls "my little campaign" to make life easier on backyard fruit growers. His crusade was based on realistic expectations and two basic principles: first, don't count on rootstock for size control; and, second, summer pruning keeps fruit trees small. He began to promote the Backyard Orchard Culture program to the retail nurseries he supplied.

When Ed handed me the Arctic Glo nectarine in the Scenic Nursery parking lot twenty years ago, he'd been perfecting his backyard methodology for fifteen years.

He maintained his closely planted trees at about his height, five foot nine, with a hand held up as high as he could reach. He harvested fresh fruit from his right-size trees spring into winter.

The Old Guard Resists

You might think that such a simple, elegant, and workable idea would have widespread practical applications that would interest both the nursery industry and the agricultural establishment. In this you would be mistaken. The methods of managing fruit trees and orchards were long established and immutable. Ed caught flack from many quarters, including California Polytechnic State University (Cal Poly) at San Luis Obispo and the University of California, Davis.

True believers keep talking, though, and this is what Ed did. He knew better. He had years of his own backyard experience to back him up. He had witnesses. He devised more fruit tree experiments for the research and development efforts at Dave Wilson Nursery. He sponsored orchards that included high density plantings all over the state under the auspices of the University of California Master Gardener Program. He talked to nurseries. He orchestrated fruit tastings and talked to the tasters. He talked to people like me.

Maybe because we didn't know better, or maybe because what he said "seemed right" to us, too, or maybe because we tasted a remarkable tree-ripe Arctic Glo nectarine in a nursery parking lot and the only tree we could have was a small one, we tried it. It worked. It was easy. We converted. We became practitioners and grew our own little fruit trees. We taught our customers how to do this. It worked for them, too.

Changes in the Landscape

After fifteen years of backyard practice and twenty years of talking, the traditional landscape of fruit tree growing has altered, thanks in good part to Ed. True, these ideas often exist in the ether, and no one person is ever completely responsible. But Ed operated in a big fruit tree arena. He refused to let his practical and timely idea sink into obscurity.

Today, you see the difference in the orchards in the Central Valley. It turns out that small trees are easier to manage in commercial operations, too. They reduce the cost of insurance, labor, and machinery. In addition, the universities came around. When you take a fruit class from a Master Gardener now, you get a lesson in using summer pruning to keep fruit trees small.

The Root of the Matter: Rootstocks

If you plant a peach pit from an O'Henry peach, the workings of genetics deliver a peach of some sort, maybe tasty, maybe not, but it won't be O'Henry. If you want an O'Henry peach (and if you've tasted O'Henry, you do), you or somebody has to graft an O'Henry *scion* – a budded shoot of a parent O'Henry – to rootstock or to an existing peach tree. All O'Henry scions are genetically identical; your grandmother's O'Henry is exactly the same as the one you're considering in the bareroot bin at the nursery. If you want an O'Henry that tastes as good as your grandmother's, you don't need to take a cutting from her tree to get one; you can buy a new O'Henry at the store.

Choosing a Rootstock

Fruit trees are rarely grown on their own roots. They are grafted to rootstocks. Fruit trees are grafted to rootstocks because rootstocks make for healthier and more adaptable plants. Various rootstocks improve hardiness, soil adaptability, water or drought tolerance, and disease resistance. Some rootstocks also adjust the size of the tree downward, though it's hard to give exact heights because so many factors are in play. Consequently, the ultimate size of the tree is of minor importance when considering fruit trees and rootstock. Unfortunately, when you try to choose your fruit tree, tree size is the only information you're likely to get from a grower or seller. You need to dig deeper.

M-111 FOR DROUGHT TOLERANCE

One grower lists, online, an M-111 apple rootstock as semidwarf. Technically, this is correct, but the size of the tree depends on the vigor of the apple variety you choose. Apple trees grafted to M-111 rootstock are dwarfed to only eighty or ninety percent of a standard-size tree. Standard trees can grow to be as tall as thirty feet, so, once again, even though the tree is called "semi-dwarf," we're talking about a large tree, one that probably grows to at least three times your size.

Yet, when I needed bareroot apples for the nursery, I ordered all the apple varieties grafted on M-111. Why? M-111 is still one of the best all-around rootstocks for apples in most of California and elsewhere. And it's easy to keep fruit trees small with pruning. The rootstocks that keep apples smaller either sucker, need staking, are not as resistant to diseases and pests, or are sensitive to drought. Gardeners in the water-scarce West keep drought and water use in mind, or ought to. At my nursery, we had an active education program regarding fruit tree size and pruning. We started trees out with the initial hard pruning they so desperately require. Our customers were prepared. As a result, they got the benefit of the better rootstock. They didn't even have to ask.

But you should.

CITATION FOR PLUMS, LOVELL FOR DISEASE RESISTANCE

A different grower lists, online, rootstock choices for peaches only as "standard." This rootstock is probably Lovell, a dependable, long-lived, and disease-resistant choice for most situations. A third offers peaches on semidwarf Citation. This choice of rootstock makes a difference. Lovell is somewhat tolerant of wet soil but prefers better drainage. In garden situations with regular water or in heavy soil, Citation is probably the better choice.

Citation's dwarfing properties are beside the point. A peach tree on either rootstock can be kept to six feet with pruning. A tree on semidwarf Citation still requires pruning and can grow to be twice your height. My fruit trees grow in great soil, but in a very low water situation. For me, Citation would be a regrettable choice. Citation is a good rootstock for lots of reasons, especially for apricots and plums, but it needs water, like the water you provide to an irrigated lawn or garden. When considering rootstock, the specifics of the garden situation matter far more than tree size.

ASK AROUND

These online fruit tree sellers are reputable and conscientious. They care about what they're selling, and they care about your success. If you ask about rootstock, you'll get good advice. Like other fruit tree topics, opinions differ on the subject of rootstock. But if a retailer can't answer your basic questions and speak with some intelligence on the subject, buy your trees elsewhere. Check with your farm advisor. Ask your local nursery which rootstock is best for your region, soil, and circumstance. Do research, but listen, too, to what suppliers say. They should have good experience with trees in the ground.

One final tip: don't drive yourself crazy. Fruit tree information can be overwhelming to the degree you can't move forward. Analyze your situation, talk to people, do a little research, and make your best judgment. A list of the advantages and disadvantages of commonly available rootstock appears in the appendix of this book. There is no perfect rootstock. Sometimes the answer is clear, sometimes it won't make much difference, and sometimes you can only get what you can get. Just remember, while some rootstocks may reduce tree size to a certain degree, their other qualities take priority. As you will come to understand in the chapters that follow, pruning is the best way to scale your tree to a size you can manage.

A FEW THOUGHTS ABOUT GRAFTING

Unless you have a compelling interest in grafting — you have some ancient, remarkable, unidentifiable fruit, for instance; or you want a slip of Grandpa's Wickson plum in your garden for sentimental reasons; or the best reason of all, for grafting's own sake, because the very idea of grafting sounds so thrilling you have to try it — do this instead: identify the fruit in question and buy a new tree at the nursery or through the mail.

I don't recommend grafting as a means to turn around an old tree, to create lower branching, or to save a portion of a tree you've grown fond of, merely because you like the fruit. When trees get old or uselessly overgrown, keep them healthy and pruned, preserve them as best you can, and begin work on a replacement.

Provided you match the conditions in Grandpa's garden, the fruit on that new Wickson plum will be just as good as the fruit you know. Fruit trees are a bargain. They grow fast. A new young tree bears fruit as soon as a graft will. If you start fresh, you can turn a new tree into a far better specimen than the tree you have now, a tree better suited to your needs in terms of maintenance and fruit quantity, and a tree that is a better fit in the garden.

With grafted multiples, you settle for fruit based on qualities secondary to what the fruit tastes like.

A successful graft is a wonder, as people who attend scion exchanges will tell you, and grafting is an avocation worth pursuing for certain do-it-yourselfers. Then again, new grafts often fail. As a result, few fruit professionals offer grafting as part of their services; it's unprofitable as a business endeavor. If you want to graft only because you want fruit diversity and are short on space, keep reading. Other approaches may be a better bet. Novel ways to address issues of space follow in the next section — methods that might speak more appropriately to your time, options, and real inclinations.

THEME AND VARIATION: GRAFTED MULTIPLES VERSUS CLOSE PLANTING

In the interest of producing different types of fruit in a small space, many nurseries sell three or four varieties grafted together in a single tree, an appealing idea for obvious reasons. Three fruits in one tree? What's not to like?

The limited available varieties, for one thing.

Three-in-One Tree

These multivariety trees limit your options to those the fruit tree wholesaler chooses for you, based on what sells. When companies combine popular varieties, those that perform well in your region might mix with others that are unsuitable or with varieties you don't especially like. Commercial tree grafters rarely include unusual or heirloom fruits. Trees with varieties grafted together to address special circumstances like disease resistance or climate considerations sometimes include varieties of dubious quality because they meet a low chill requirement or have resistance to something like peach leaf curl or fire blight. In other words, you settle for fruit based on qualities secondary to what the fruit tastes like.

As they get older, grafted combination trees tend to lose grafts to become two-in-ones, or even lopsided one-in-ones. In many cases, one excessively vigorous variety takes over. In my experience, almost spitefully it seems, the least desirable fruit of the group grows amazingly well, and the fruit you wanted most, the favorite, dies off. In my backyard, I have a two-in-one plum that started out as a four-in-one.

If you find a three-in-one that appeals to you, though, by all means, try it. Prune it, winter and summer, the way you would prune an ordinary fruit tree. Encourage equality among partnered varieties by utilizing the consequences of timing. Curb the enthusiasm of vigorous sections with summer-only pruning. Prune wimpier sections in winter to take advantage of the increased vigor that allows them to catch up.

Instead of buying a three-in-one tree, plant two or three trees close together and train them apart from each other.

Ripening Times

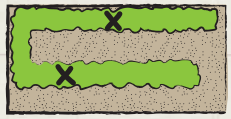
Give consideration to ripening times when choosing fruit for the backyard. Otherwise, you end up bombarded with fruit during the last two weeks of August. Good planning stretches harvest from spring to winter: apricots in June, three varieties of apples, cherries, or pears planted together to extend the season, plums and pluots summer to fall, and pomegranates and persimmons from autumn to the winter solstice.

Most fruit on a single tree tends to ripen all at once, but you can stretch your garden fruit production from late spring into early winter by staggering early-, mid-, and late-ripening varieties. Some varieties, like Red Haven peaches, Emerald Beaut plums, Flavor Queen pluots, and Grimes Golden and Golden Delicious apples will note in their descriptions a long fruiting season – a great feature in a garden tree.

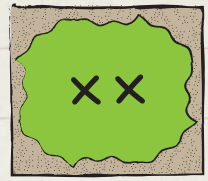
Close planting is a great alternative to grafted multiples. Plant two, three, or even four trees of your choice eighteen inches apart, control their height, and train them to grow away from each other. When treated this way, multiple trees take the same space in the garden as one tree does. Prune for an open center as if the configuration were a single tree. Thin middle branches when they get in each other's way. Root competition helps closely planted trees stay smaller. Summer pruning keeps vigor under control. This method gives you the option of choosing your favorites, more unusual varieties, and varieties that work well in your particular climate. Using this tactic, you can plant trees that ripen in succession or trees that need pollenizers — even if you're short on space.

Trees with similar growth habits and matching rootstocks make natural partners: three apple trees on M-111 rootstock, an early, midseason, and late variety, for instance, or a pluot and a cross-pollinating plum. I prefer the look of three for a free-standing group. You may want to plant groups of two as a border along a sunny fence. You can co-plant almost any fruit trees with similar water requirements if you don't care what they look like, and you might not if space is tight. Trees like apricots and apples that have wildly different growth habits and growth rates require more attention to pruning, especially in summer. Prune any of these configurations as you would a single tree, so that the trees grow apart from each other and limbs don't overlap. You also can plant trees in a hedgerow three to four feet apart and prune branches in summer so they stay out of each other's way.

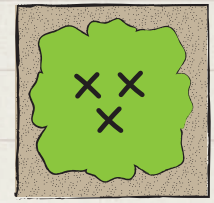
The Close-Planting Technique



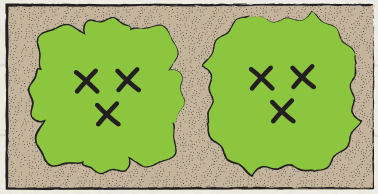
5' x 10' area
Two trees espaliered



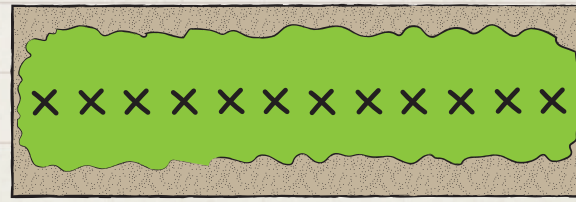
8' x 9' area
Two trees in one hole,
18" apart



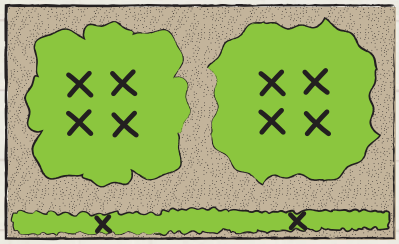
10' x 10' area
Three trees in one hole,
18" apart



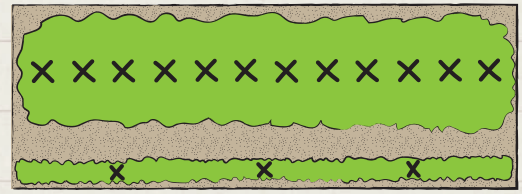
12' x 20' area
Two sets of three trees in one hole,
trees placed 18" apart



10' x 30' area
Twelve trees in a hedgerow, 30" apart
Or plant three sets of four trees in one hole



12' x 20' area
Two sets of four trees in one hole,
plus two espaliered trees



11' x 30' area
Twelve trees in a hedgerow, 30" apart,
plus three espaliered trees

Marion Brenner: A Big Fan of Small Trees

When **Marion Brenner** first learned about the garden possibilities of little fruit trees ten years ago, she planted fourteen bareroot whips on four-foot centers along a low, western fence, apples closest to the house and plums and pluots along the fence as it continued up the hill. The following year she added "a mix of stuff," eight more trees to that same row, making twenty-two trees in all. The year after that, she planted four fruit trees near the path on the other side of the yard. She then added seven more trees in the center of the garden. She installed a Fuyu persimmon next to an existing Hachiya. She began to prune her established figs, a Brown Turkey and a White Genoa, and pruned them harder than she had before, which resulted in a lot more fruit.

"The white fig is fantastic," Marion says.

Then she took out an elderly and ailing Gravenstein apple tree. By that time, she had planted so many apple trees that logic suggested she buy her Gravensteins at the market, and that's what she meant to do. Gravensteins make the best sauce, famously so, but keep poorly. Once the tree was down, though, the open sunny space brought her to the nursery for two new Gravenstein saplings.

"How could you not?" she said, "Apples are so easy in Berkeley."

Marion's path is not one I recommend for zealous beginners. Try a couple of trees first. Don't put in the whole orchard right away. See how you like it. But Marion is blessed with garden experience and an enormous yard, mostly sunny with a few established trees. She gardens on a big slope that faces southwest on the Berkeley-Oakland border, one of the best places, climate-wise, to grow fruit trees in the East Bay.

She and her husband, Robert Shimshak, are collectors by nature. They kept adding fruit trees of all kinds in many varieties: apricots, plums, pluots, an aprium, apples – Pink Pearl, Cox's Orange Pippin (a favorite), Yellow Bellflower, Golden Delicious, Fuji, Ashmead's Kernel – pears, persimmons, and even a nectarine and a peach. They wanted one of everything.

"I think it's just the greatest way," Marion said of the short tree method. "The trees look great. It's fun. It's easy. There's never too much of one kind of fruit."

"It's just the greatest way," Marion said of the short tree method. "The trees look great. It's fun. It's easy. There's never too much of one kind of fruit."

Three years ago, inspired by an old quince hedge she encountered in Sonoma, she crowned her collection with a Smyrna quince hedge of her own, twelve trees long, which is just now producing its first flowers and fruit.

Marion has planted twenty-two fruit trees along a low, western fence in her backyard.

"It was so pretty," Marion said. "I had to do it. The fruit smells so good. You don't need a lot of quince, of course." She installed her hedge at the rear of the garden near the chicken coop. When she was done she had sixty-seven fruit trees in all.

This quantity might be a burden if the trees weren't so easy to maintain. The stone fruits grow so fast that Marion summer prunes in early June, and again in August. For the first time, the aprium is full of fruit. The pluots crop is better or worse depending on spring weather. As one familiar with local climate would expect, the apricots are not so reliable, but she gets a few.

"Berkeley," she shrugs.

Her initial impulse to organization faltered as she added more trees. I told her about a Scenic Nursery colleague who pruned his trees with tall trunks up a six-foot fence. Each trunk grew a tuft of fruit tree at the top of the fence where the sun was. The trees ripened in succession throughout the growing season. She wishes she, too, had positioned the trees more logically and had taken more care with labeling. If she'd planted the long row of mixed trees a little farther from the fence, she could more easily get around the back to prune them.

Squirrels got every Seckel pear last winter – squirrels love pears – but short of armed warfare, there's not much to do about squirrels. The Arctic Star nectarines are delicious, if the squirrels don't get them first. But squirrels are a minor annoyance overshadowed by how much Marion enjoys keeping her trees in good form as she reaps a nearly continual harvest of fresh, ripe fruit from her garden.

THE ESPALIER

Since the Middle Ages, espaliers have provided living proof of the sculptural adaptability of fruit trees. An espalier is a tree supported by a structure or trellis, usually kept fence high, and trained to grow flat against a wall. The popularity of the espalier derives from its capacity to produce lots of fruit in narrow, sunny spaces. Espaliers take maximum advantage of the fruit-producing capacities of horizontal branching. As a result, they require support for their fruit-laden limbs. Depending on variety and pruning style, an espalier can be a fruit machine, a work of art, or both. Apples and pears are most commonly used for formal espalier because of their malleability and strength. Any of the slower growing and sturdier fruit trees like persimmons, cherries, and prune plums adapt to this treatment equally well. Train the inherently weaker stone fruits into an informal flattened fan.

A traditional espalier begins with a low pruning cut where you want the first tier to branch. Encourage the top bud to grow vertically. This bud will form the center trunk, or leader. Train the two buds below to grow horizontally along the first support. As side limbs extend, attach them to the wire or trellis with tie tape. Repeat this procedure the first and second seasons. Prune the vertical branch to the point of the desired second tier; allow the leader to grow vertically and two buds below to form the second tier. Provide at least a ten-inch space between the tiers. Repeat the third season. Grafted espaliers in a similar format are often available at nurseries with multiple grafts of six different varieties in a single plant.

The informal espalier form works with any fruit tree. Simply support a flattened fan shape against wires, a trellis, or the fence. Encourage a two-dimensional form with pruning. Consider the direction of buds and how they will grow as you orient the plant in the ground for the initial pruning cut. They should align with the fence. Choose a couple of likely branches from response to the first prune, remove what's extraneous, and train your favorites flat.

The issue of timed pruning is important with espaliers. Winter prune lightly for shape using thinning cuts. The tree's vigorous response to winter pruning works against your plans. Espaliers require summer pruning to keep the tiers and close branches from bumping into one another. Remove branches that grow toward the fence or into the garden path. Don't make it complicated. An espalier is defined by its flatness. It can be as freewheeling or formal as you like. As Scenic Nursery's Jim Rogers liked to say, "Picture an espalier in your mind and cut off anything that doesn't fit into the picture."

The informal espalier is simply a flattened fan supported against a wall or fence and pruned to encourage a two-dimensional form.

CHAPTER 3

the ELEMENTARY PRINCIPLES of PRUNING

"A well-pruned, mature fruit tree is a beautiful sight."

— **ROBERT L. STEBBINS and LANCE WALHEIM,**
Western Fruit, Berries and Nuts

IMAGINE THE QUALITY OF LIFE OF A FERAL CHICKEN OR A WILD COW. A fruit tree is a domestic creature much like they are. Fruiting aside, if fruit trees are to be adequate even as trees, they need human intervention. A feral fruit tree is useless even to itself.

A pruner directs growth by favoring one bud over another.

There's no way around it — fruit trees require pruning.

Abandoned orchards poignantly illustrate how fruit trees overproduce and break themselves down. Overgrown limbs block sunlight. When light can't enter the center of a tree, fruit develops at the ends of branches too weak to support it. If nobody thins and spaces the fruit along the branches, the weight of too much fruit can crack a tree apart. Fruit from neglected trees is small, scant, or excessively abundant; bug-ridden; and mostly out of reach or rotten on the ground. Fruit left on the ground to rot harbors insects and disease and generates trouble for years to come.

Regardless of how large a fruit tree is allowed to grow, pruning builds structure into the tree. A fruit tree can't adequately create this structure by itself. Regular pruning strengthens a fruit tree, rejuvenates it, encourages new fruiting wood, and maintains fruitfulness lower on the tree. In essence, pruning creates a sturdy and healthy tree, more fruit, and more reachable fruit. Regular pruning, winter and summer, is also one of the best ways to get acquainted with your fruit tree. Time spent pruning creates opportunities to monitor your tree's progress and observe it for signs of trouble. Additionally, though by now it should go without saying, pruning is also the best way to keep a fruit tree small.

Luckily, pruning is simple. Only two types of pruning cuts exist. Pruning cuts are classified as either *heading cuts* or *thinning cuts*. When you grasp the difference between the two, you know much of what you need to know about pruning fruit trees or anything else.

HEADING CUTS

Like other trees and shrubs, fruit trees grow from the tips of their branches. A heading cut removes part of a shoot or limb. It deprives that limb of a growing tip. A branch needs a growing tip to be able to grow. When the tip is removed, the remaining part of the branch makes hormonal adjustments that generate new growing tips by activating the buds left behind. The buds below the cut develop into new branch tips and grow to be new branches. A heading cut forces a limb to generate new growing tips in the form of new shoots.

Heading cuts shorten limbs. The newly generated growth below the cut increases branching and bushiness. Anyone who has sheared a hedge is familiar with the dense and shrubby consequences of many small heading cuts. Heading cuts made with hedge shears create the square and round shrubbery so common in commercial plantings.

The first prune for a newly planted fruit tree sapling is a dramatic heading cut that radically alters the growth pattern of the tree. This cut triggers the buds that will become sturdy, low-branching limbs and the major fruit-supporting branches. People conversant in fruit trees refer to these three or four major limbs collectively as *scaffold limbs* or simply as *the scaffold*.

Prune to Outside Buds

Leaf buds circle a stem all the way around. If you do no pruning, leaf buds sometimes develop into branches but more usually develop into leaves. When you make a heading cut, you remove the growing tip and prune above a bud. That bud changes and becomes the primary growing tip. A pruner directs future growth by favoring one bud over another. An *outside bud* is nothing more than a bud that points away from the interior of the tree. Outside buds become limbs that grow in an outwardly direction away from the interior of the tree.

THINNING CUTS

A thinning cut removes an entire branch or shoot at its point of origin, the place where the branch emerges from a limb. Thinning cuts subtract branches. These subtractions redirect a tree's energy and growth into the limbs that remain and, consequently, to the growing tips that are left behind. Thinning cuts preserve growing tips, decrease the number of branches, reduce crowding, and open up the interior of the tree to light and air. This light is crucial for the formation of fruiting spurs, the squat twiglets that blossom and ultimately bear fruit. Judicious thinning also supports and reveals the natural shape of a tree. Most pruning cuts, winter or summer, will likely be thinning cuts, especially as a tree gets older.

A handsome heading cut angles with the direction of the bud and doesn't leave a stub.

Thinning cuts subtract entire branches by removing them at their point of origin.

Anatomy of a Pruning Cut

Branches heal so beautifully from properly executed pruning cuts that plant tissue almost seems designed with shears in mind. Pruning wounds from well-executed cuts callus cleanly and won't detract from the natural lines of the tree.

A handsome heading cut follows the angle of the bud. Make the cut at an angle as close to a bud as possible. The bud nearest the pruning cut will determine what direction the limb will grow. A well-executed heading cut preserves the bud and doesn't leave a stub.

A branch extends from its limb surrounded by two types of woody growth. A ridge forms at the top of a branch and marks where that branch separates from the supporting limb. The aptly described *collar* is thick tissue that surrounds the branch at its base. A perfect thinning cut angles to preserve both the ridge and the collar without leaving a stub.

Pruning cuts don't heal the way skin heals. Instead, plant tissue grows to enclose the wound and seals it over to prevent the infestation of pests and disease. Trees adeptly heal themselves. Let them. Tree seal compounds interfere with this natural healing process and are no longer recommended.

A heading cut removes the growing tip and part of a limb. Buds below the pruning cut become new growing tips and bushy growth results.

WHEN TO PRUNE

In addition to the two types of pruning cuts, a pruner needs to understand the importance of timing. Timing matters. Plants react differently to pruning depending on the time of year or, more accurately, when pruning takes place in the seasonal cycle of the plant. How a tree responds to pruning depends on whether the tree is about to grow, actively growing, preparing for a dormant season, or fully dormant.

Deciduous trees cycle through an obvious pattern of growth and dormancy. They lose foliage all at once, usually in autumn, though not always. Some plants cope with drought conditions by defoliating and preserve themselves with a late summer dormancy — for example, the buckeyes on the hill behind my house, my dry-gardened rhubarb, and a certain never-watered fig of my acquaintance. Evergreen trees, including plants such as citrus, shed foliage year-round because they are never fully dormant, though they, too, have a growth spurt in spring.

Summer Pruning: Timing Is Everything

Deciduous plants of all kinds, fruit trees included, push growth in spring from reserves stored during the latter half of the previous season. Deciduous fruit trees aggressively expend the energy stored in fall and winter when they bloom, leaf out, and most actively grow in spring and early summer. When spring arrives, the tree is in a mood to grow, and grow it will, often at an alarming rate, whether you got around to pruning it or not.

Once the leaves emerge, plants gather energy through photosynthesis and begin as early as July to return that energy to the trunk and roots, where it will rest in reserve all winter. In fall, the tree loses its foliage. It goes dormant, with resources stored and largely inactive, until the cycle begins again in spring.

If deciduous plants are pruned in late winter, the traditional pruning time, they outgrow the pruning with the full force of these stored reserves. When you want a plant to recover from pruning so it looks nice right away, prune in late winter, just before spring. Prune spring flowering shrubs as soon as flowers fade. Plants pruned in winter will, by June, be again as tall as they were in January, an advantage in some circumstances — if you expect the garden club to drop by, for instance — but useless for size control.

The summer solstice in late June marks the midpoint in the annual growth cycle. By the time of the solstice, a tree's resources have migrated from the roots and trunk and are stored primarily in the foliage. Solstice pruning removes some of these resources. Fewer resources means less vigorous growth, much like cutting the calories of a too-energetic

eater. Summer pruning slows a tree down, a desirable result when you have an interest in keeping your fruit tree small.

Prune near the solstice. Time summer pruning so it occurs near the summer solstice. In early summer, trees still have plenty of vigor to recover from pruning. They grow, but at a moderate pace. Pruning cuts made while a tree is still actively growing heal quickly, too. Peaches, plums, and apricots pruned in fall and winter can grow as much as eight feet the following spring. The same pruning cuts made in the solstice season yield growth of only a foot or so. Solstice pruning keeps fruit trees (and other garden shrubbery) in check.

The later in the summer you prune, the more you reduce the beneficial size control effects of summer pruning. By mid- to late summer, nutrients that leaves collect have already begun to store in the trunk and roots. As far as the tree is concerned, late summer pruning and pruning into September more resembles winter pruning. As early as August, a tree is headed into dormancy.

Winter Pruning

Winter is the best time to make structural and aesthetic decisions because the tree is bare. When a tree lacks foliage, it's easy to evaluate the configuration of existing branches and decide what belongs and what doesn't. You can see exactly how the tree is growing and determine what you need to do to help it.

Winter is the best time to remove poorly placed limbs. By that I mean anything that doesn't look quite right — limbs that are too horizontal or branches that grow into the fence, are too crowded, or just seem wrong. You want to remove what Portland, Oregon, pruner John Iott calls the three Ds — "the dead, the diseased, and the disoriented."

Winter is the best time to open up the interior with a few well-considered cuts that let in light and air. Observe the growth pattern of the tree and prune to enhance its natural grace. By removing awkward branches, you allow the tree to open up and begin to take form. Winter pruning is like editing. You remove what gets in the way so the real story can unfold.

Make heading cuts in winter only when you want an enthusiastic response — when you're trying to develop the first low scaffold branches, for example, or when you're trying to rejuvenate an older tree. Prune more heavily in winter only if a tree has stalled, if pruning has been neglected and the tree needs correction, or if you were too timid last time and want to generate some better choices this time around.

Suckers and Water Sprouts

Suckers are limbs that grow from rootstock below the graft. Suckers can also pop up from surface roots some distance from the tree. Certain rootstocks are notorious for suckering, like the Marianna 2624 that is sometimes used with apricots, plums, and peaches. If left in place, suckers direct energy into their own growth, which diverts growth from the scion. Watch for thorny fast-growing suckers on citrus and remove them. When a citrus tree produces large fruit with a thick rind and a pithy interior, this "rough lemon" is the fruit of the rootstock. Suckers can outpace the topstock, leaving a tree that is primarily or entirely rootstock. Last summer, I had the opportunity to try a rootstock peach. It was small, yellow, and tart, and better than I expected, but rootstock fruit is not the fruit you had in mind when you planted your tree.

Suckers grow from rootstock below the graft.

A water sprout is a vigorous upright shoot that grows from a scaffold, often in response to a hard pruning cut.

Water sprouts are tall, aggressive upright shoots that grow from horizontal limbs, often in response to wounds or pruning cuts. Remove them. Water sprouts differ in character from ordinary branches. They grow faster than regular limbs, a tendency revealed by the wide placement of leaf nodes when you compare the two. Hard winter pruning often results in water sprouts. If a water sprout arises in a place where you want a limb to be, you can change its nature with corrective pruning and develop it into a useful, fruiting branch. Prune in summer above a well-directed bud to slow it down and encourage a more horizontal habit.

Prune suckers and water sprouts at any time of year. This type of growth saps a tree's resources and is rarely productive.

FRUITING SPURS: WHY THEY MATTER AND WHY THEY DON'T

For most deciduous fruit trees, fruit develops on fruiting spurs, with figs, nectarines, peaches, and persimmons being notable exceptions. Young trees don't set much fruit for the first few years because fruiting spurs take two to four years to develop — no fruiting spurs, no fruit.

Spurs are relatively easy to spot. They differ in character from other buds and branches — short, thick, and somewhat stubby. Fruiting spurs are more likely to develop on more horizontal branches. In fact, bending an upright branch sideways and keeping it that way, along wires, by weighting branches, or with clothespins, creates physiological changes in the limb favorable to the development of fruiting spurs. Most fruiting spurs produce flowers and fruit for several years and eventually die off, but given adequate light falling on interior branches, fruit trees continually generate new spurs.

Pome fruit spurs

Stone fruit spurs

Don't Worry

Some people go to great lengths to preserve fruiting spurs, but don't bother. Fruiting spurs develop naturally. Cut some out, and more come along. When branches are removed with regular pruning, enough light penetrates the interior of a tree to maintain the continual development of fruiting spurs. Preserve too many branches in the interest of preserving spurs, and your tree will create so much interior shade that it won't generate new ones.

If you prune regularly, spurs continue to develop on the older, more horizontal branches, which is exactly where you want them to be. Few spurs occur on the upright growth you prune off every summer, growth that is too weak to support much fruit anyway. It's useful to know what spurs look like and what they are but more important to create a light-filled and well-formed tree. Rather than painstakingly preserving the fruiting spurs of today, open the interior of your tree to more sunlight and encourage the spurs of the future.

Prune your tree. Make it handsome. You can afford to lose some fruiting spurs.

If you still worry about pruning off fruiting spurs by mistake, be aware that a fruit tree is still dormant when it's blooming. Save your dormant season pruning until the tree blooms in spring, and prune around the blossoms. Bear in mind, though, that cutting off flowers is a lot like cutting off unripe fruit; namely, emotionally difficult. Sound pruning decisions are easier to make when they're not complicated by flowers.

You might want to watch for and preserve spurs on a young tree so you get the reward of a little harvest. We grow fruit trees for fruit and, for most of us, the sooner the better. I sometimes leave low branches on a tree for this reason, with the intention to remove them later. Short twiggy interior growth is often fruitful. You can prune off awkwardly placed branches once the harvest is in.

Some experts advise the removal of all fruit from a young tree. While thinning fruit is always a good idea, most fruit trees have more than enough vigor to manage a little fruit set early on, especially for backyard farmers eager for a first crop.

Try not to overthink the fruiting spur issue. Prune your tree. Make it handsome. You can afford to lose some fruiting spurs. Your fruit tree will still produce plenty of fruit. It will also be better positioned to produce fruit in the future.

DON'T FORGET TO THIN YOUR FRUIT

Second only to the knee-high pruning cut, the most daunting task for almost all fruit growers is fruit thinning. The removal of immature fruit from a fruitful tree meets with deep emotional resistance. How could it not? All that abundance, all that beautiful potential condemned to the compost pile by one's own hand. The better steward takes a long view, though. There are good reasons to do so.

Thinning: As Important as Pruning

Fruit thinning is as important as pruning for the overall health of the tree. A fruit tree more easily manages less fruit. Excessive fruit competes for available resources. According to the Cornell University Extension Service every apple needs about thirty leaves to support its development. By focusing nutrients into fewer fruits, thinning allows each remaining fruit to reach its full potential without taxing the resources of the tree. In addition, thinning keeps individual fruits separate. This reduces the spread of pests and disease. Thinning also helps to even out alternate bearing tendencies — the inclination for certain trees to bear heavily one year and lightly the next.

SECKEL PEARS

Before thinning

After thinning

Fruit thinning is good for trees. Fruit is heavy. The riper fruit gets, the heavier it becomes. If every fruit is allowed to ripen, the weight of that fruit strains the capacity of the tree. Even sturdy, well-pruned fruit trees set more fruit than they can possibly manage. Fruiting spurs on an apple tree set clusters of three to five apples each. Left unthinned, the weight of these apples pulls branches permanently downward into a dense, fountainy thicket. Apricots, plums, peaches, and nectarines can set hundreds of fruits up and down the limbs. Branches often break under the strain of this overabundance, even on pruned and managed trees.

Small fruit trees greatly simplify the fruit-thinning assignment.

Trees abort some overcroppage early in summer in a process called June drop. Don't be alarmed when a tree sheds this immature fruit, but nor should you rely on trees to adequately thin themselves. Fruit growers have a responsibility to thin fruit. Conventional orchardists use chemicals for thinning. Backyard fruit growers thin by hand. Small fruit trees greatly simplify the fruit-thinning assignment.

Around the time of your solstice pruning, when fruit is about as big as the end of your thumb, thin clusters down to a single fruit. Thin larger fruits like apples and peaches to the stretch of a hand span or about eight inches apart. You may need to remove some

SANTA ROSA PLUMS

Before thinning

After thinning

apple clusters entirely. Keep smaller fruits like plums separate to the width of your fist or about five inches. Thin along branches. Preserve larger fruits and remove smaller ones. Remove fruit that shows signs of insects or disease. In an average season you might take off up to seventy-five percent of fruit set if you're thinning correctly. Unthinned fruit may be abundant and seductive, but it's hard on the tree. Better for both tree and grower to have fewer, superior, and evenly distributed fruits.

AESTHETIC PRUNING

Aesthetic pruning principles apply elements of bonsai to landscape pruning and operate at the intersection of art, Nature, and the science and craft of pruning. Aesthetic pruning is also a great way to prune a fruit tree. In the case of fruit trees, practices that remove limbs to create an open and idealized version of the tree also make the tree stronger and more fruitful.

An aesthetic pruner supports and emphasizes a tree's natural growth habit much the way any craftsperson, like a cook or a haircutter, works with natural tendencies to heighten assets and downplay faults for highest use and the best aesthetic effect. An accomplished pruner works with the currents of Nature to create a better and more attractive tree.

Artful pruning creates space and supports and reveals the natural shape of a tree. The tree opens up and takes form.

Aesthetic pruners seek the "essence" of a tree, and they prune to support its most salient feature — for instance, an upright or spreading growth habit, distinctive bark, the delicate foliage of the Japanese maple, or the wild abandon of plums as compared to the steadiness of apples. I think that an essential feature of a fruit tree is not just its fruiting or form, but also its domesticity, its need for pruning and the companionability and care of people.

Another feature that defines aesthetic pruning is situational: how a plant works with the plants and the environment around it, and how a tree fits into a tight urban space or an expansive rural one and still maintains its character. This issue is critical for backyard fruit trees, which are better off small both because of the routine care they require and the space constraints in most ordinary gardens.

Stand back. Forget what you read on the Internet. Attend to the tree before you. Observe the growth pattern of the tree. In pruning, as in any good design, negative space plays an important role. Well-pruned trees have an airy quality. Yuki Nara of the website Way of Maple says that a bird can fly through a well-pruned Japanese maple — good standard for a fruit tree, too.

Let the tree offer you its own aesthetics. Your job only requires that you remove what doesn't belong. Each pruning season creates a new response and builds on what we did (or didn't do) before. Prune away confusion with the best artistic eye you can muster. Winter pruning is lighter than summer pruning and a little like the directive in a cookbook: correct the seasoning. Hard winter pruning results in extremely vigorous regrowth in spring. I avoid it, making only a few architectural thinning cuts per tree. Artful pruning creates space and supports and reveals the natural shape of a tree. The tree opens up and takes form.

If you're unsure, mark errant limbs with blue masking tape before you prune them. This process lets you consider the effect of a pruning cut on the overall picture before the damage is done (and can't be undone).

John Iott's Blue Tape Trick

There are many paths to a well-pruned tree. Fruit trees are a combination of what they do and what you make them. You and your tree build the ideal as you go along. Right choices or wrong ones can be fairly arbitrary. Different pruners make different pruning decisions. In fact, the same pruner likely comes to a different decision on Tuesday than she would have on Wednesday. Trees grow. Each pruning season brings new opportunities. In the case of fruit trees especially, *that* you're pruning is more important than precisely *what* you're pruning.

An important first step? Develop a capacity to trust your decisions.

The first thing for any pruner to do is to stand back and observe the tree. Take a walk around it. Really look at it. Take it in. Now ask yourself the question, what's bugging me? Certain branches will. They're low. They droop. They're sickly. They gather in a thicket. They cross other branches. They duplicate other branches. They're stupidly placed. They head in the wrong direction. They're wrong in some indefinable way. They grow right up through the center and crowd out sunlight. Relax, you don't have to make any decisions or cut anything out just yet.

Get a roll of blue painter's masking tape. Use this tape to tag branches where you might want to cut them. If you want to remove an entire limb, put the tape just above the collar. If you want to make a directional heading cut, consider which direction the bud is pointing because that's the direction the resulting limb will grow. Put the tape above the bud. When you're beginning, tape several branches and step back to consider how the tree will look without the tagged limbs.

John Iott likes to say that every pruning cut has two parts: the cut itself and how the tree grows in response. He suggests that you explain your thinking to yourself. What will this pruning cut achieve? What will the tree do next? If you make a heading cut, the branches behind the cut activate and grow. Do you need choices in this particular spot? More vigorous and bushy growth? Will the heading of this limb create too much shade? Will new growth fill an empty region of your tree? If you make a thinning cut, the limb will be removed completely and open up a space. Will the absence of the limb let light in and reveal a more handsome shape? Give other branches needed space?

The presence of the tape allows you to better imagine the absence of the branches. When you stand back, make your best guess. Sometimes it's obvious. Sometimes it won't much matter. Make the cut or don't make the cut, as you choose, and move along with the tape to other limbs that bother you. If you're unsure, leave the tape in place and come back to it later. Pruning creates a dynamic that can't really be planned in advance, and for which there is no right answer. First choices shape later choices, and that's the way it should be.









CHAPTER 4

CHOOSING VARIETIES

"Look at this apple. It's as pretty as a girl."

— **OVERHEARD IN CALAVERAS COUNTY AT A HUMBUG CREEK FARM CIDER PRESSING**

"QUINCE," WE SAID, when a customer showed us the apple for identification.

"No," she said. "It's an apple. A good one."

Unassuming and lopsided with yellow, flecked skin, and new to us, we sliced it up at the counter for a taste test. The sample had a complex and notable flavor, crunchy, aromatic, and sweetly tart. These apples grew in varying sizes on her tree, some quite large.

"An excellent baker, too," she said.

In Berkeley, mild weather makes fruit growing a challenge. This apple belonged on our roster. By the time a second customer came in with the same mystery apple the following week, we had tracked it down — a low-chill, colonial variety from New Jersey called Yellow Bellflower. An apple so delicious it followed the homesteaders west.

The Yellow Bellflower apple is beautiful in bloom and so delicious that it followed the homesteaders west.

PLANT FRUIT YOU ENJOY

The first rule of fruit selection is this: plant fruit you like to eat. Different people have different preferences. Years of fruit consumption yield certain conclusions. Some people like achingly sweet fruit, or soft fruit, or balanced fruit, or fruit so tart it makes their hair stand on end. Decent fresh apricots are nearly impossible to find at the market. I have little memory of specifics, but I do recall the flat-out abundance of meltingly delicious, dead-ripe summer fruit in the San Joaquin Valley, passed around so freely it never occurred to me that I might one day have to live without it. Canners and bakers want to choose fruit suited to their purposes. Many great backyard varieties perform admirably in more than one role.

Many fruit tree planters have memories of a favorite fruit — the plum that grew over the fence from a neighbor's yard, for example, or a great aunt's apricots. If you have access to the actual fruit, try to get it identified at a farmers' market or through your Cooperative Extension. Your fruit ripens the same time a farmers' market has it for sale. Catalogs and websites offer great photos and descriptions for the would-be fruit identifier. Check a ripening chart like the one on the Dave Wilson Nursery website against fruit descriptions for timing information that narrows the field of likely matches, which is especially helpful if all you have is a memory of the fruit.

One very nice thing about growing small fruit trees is that you have room for more trees and can harvest small crops of different kinds of fruit June to December.

Your mystery fruit is unlikely to be a rare variety unless your tree is ancient or you have reason to believe your tree was planted by a fruit enthusiast who sought out exotics. Most of the time people plant what is commonly available, either through mail order or locally. They tend to keep planting common varieties that perform well where they live. A little historical research at an established nursery can probably help you determine best sellers around the time your tree was planted.

Classic Varieties and Beyond

There's nothing dull or uninspired about selecting common varieties if you like them, as you discover when you taste one fresh from a backyard tree. Ordinary varieties like Blenheim apricots and Santa Rosa plums become common for both their flavor and their reliable behavior. Fuji apples are popular for good reason.

Fujis define the perfectly sweet, juicy, crunchy apple. They keep well. Hot climates like the Central Valley in California are usually unfavorable to apples, yet Fujis perform well there. Provided the growing season is long enough and they get late summer heat, they're fine in cool climates like the East Bay, too.

But don't stop with Fuji. One very nice thing about growing small fruit trees is that you have room for more trees and can harvest small crops of different kinds of fruit from June to December. You can plant Cox's Orange Pippin apples for fresh eating and Yellow Newtown Pippin for pie. Small trees and close planting create space for experimentation and for planting fruit on the endangered species list. There's room for Yellow Bellflower. There's room for a Hudson's Golden Gem or a Wickson Crab.

A homegrown Fuji will be tastier than any Fuji you ever bought at the store.

Talk to local fruit growers, your friends and neighbors, and local nurseries. Seek out local fruit gurus. Stop at farm stands and farmers' markets. Taste lots of different kinds of fruit, especially fruit that is locally grown. We perked up when we encountered the Yellow Bellflower because it was grown in the neighborhood. Ripe local fruit gives you the best indication of how that fruit will taste when it comes from your garden. Because you aren't a farmer, you can attempt things that farmers can't afford to try — wonderful fruit with a short shelf life like Gravensteins, or the achingly delicious Emerald Beaut plum that needs a pollenizer, and looks, well, homely and unappealing.

The quality of fruit you buy at the store is not a reliable indicator of the quality of the variety. Yellow Newtown Pippin apples show up in markets in September when they're still green, literally green, in color and also not quite ripe. They have yet to develop the yellow blush that gives them their name and lets you know they're ready. Golden Delicious apples, commonly found in grocery stores year-round, may taste bland from the store but really are delicious if you grow them yourself.

Classic varieties like Golden Delicious available for sale to fruit growers for years and years have proven themselves. Varieties with limitations tend to drop out of the

marketplace. Plants cycle in and out of fashion just like clothing does. Heirlooms are the latest thing, but heirlooms aren't created equal. Heirlooms are not worth growing simply because they're heirlooms. Try the fruit first.

True, some heirlooms have been wrongfully cast aside, but sometimes they recede in popularity as a consequence of their flaws or because better fruit replaces them. What we know as heirlooms were once recent introductions. Floyd Zaiger, a modern Luther Burbank from Modesto, California, brings us plum and apricot combinations like pluots and apriums, and the peacotum — a plum, peach, and apricot cross — the old-fashioned way, by hybridization. Hybridizers develop new varieties with better flavor, texture, keeping qualities, disease resistance, and more climate tolerance. Modern apples like Braeburn, Fuji, and Pink Lady have exceptional texture, juiciness, and flavor and are well behaved in the garden besides.

Risky or Reliable?

In contrast, and in spite of glowing descriptions, very recently developed varieties lack real-life trials under a variety of conditions in ordinary gardens. If I'm stuck between two choices that sound good, I usually choose the more familiar, time-tested model. But that's me. Reliability matters. Does this mean you should abandon a desire for the rare and unusual or recent introductions? Not at all. In terms of time and cost, taking a chance on an odd or new variety represents a modest investment — if you crave adventure and can afford the time and space. Fruit is an individual matter. Different people have different fruit growing objectives, different ideas about what tastes good and what sorts of imperfections they can tolerate, and different plans for the fruit.

Classic varieties like Santa Rosa plums have proven themselves to be fruitful, flavorful, and reliable.

POMES AND STONES

From its parent the rose, the deciduous fruit family tree branches in two directions, pome fruits and stone fruits. The *pome* branch contains apples, pears, quinces, and also pyracantha, hawthorn, the toyon of Hollywood renown, and, curiously, to me anyway, loquats. The fruit of a pome develops above the former blossom, a position botanically classified as "inferior," and around one of its principle characteristics, a seed-containing core. The nubbin you see at the end of an apple is the former flower.

A *stone* fruit is the common name for a type of *drupe*, a fruit that develops around a hard pit. Stone fruits are termed "superior" because fruit develops from the center of the blossom. The stone branch of the family tree, named for its stone, or pit, includes peaches, plums, cherries, and almonds. Almonds are actually stone fruits that lack the fleshy part of the fruit that we would normally consume if we were eating a plum or a cherry. With almonds, we eat the seed that grows inside the hard pit.

This information has botanical sorting significance, but do these distinctions matter to the ordinary fruit grower? Not very much. Pruning is not that different between the two, or it doesn't have to be. Most stone fruits grow more quickly and have shorter life spans than pome fruits. Pome fruit trees tend to be stronger and therefore better adapted to espalier. Still, these terms are used as identifiers. It's useful to know the terminology.

The fruit of a pome, like this quince, develops around its principal characteristic, a seed-containing core. Apples and pears are also pome fruits.

CLIMATE CONSIDERATIONS

When considering variety selection, think about climate. Match your use and flavor requirements to fruit that excels where you live. The Cooperative Extension Service maintains fruit variety recommendations county by county and other information that gives you your best chance for success in any region of the country. The more your county depends on agriculture, the more critical Extension Service information is to farmers, and the more likely it will be an active and vital part of the local agricultural community.

All kinds of factors dictate whether fruit trees perform well or poorly: heat, cold, frost, soil quality, and the length of the growing season. Some trees won't produce fruit under adverse conditions or produce fruit so occasionally it isn't worth the trouble. Some trees languish, and some trees die outright. Legendary fruit might not live up to its reputation in your climate. The insipid flavor of peaches grown where summers are cool will break your heart. A prudent fruit grower accepts the realities of climate limitation.

Choosing for Chill

Varieties also have differing requirements for *winter chill*. In the roughest possible terms, the higher the number of chill hours, the longer the temperature has to be cold for the tree to do well. Cold weather forces deciduous trees into dormancy. High-chill trees want to grow in Vermont. Low-chill regions like Florida and Los Angeles confuse a tree about its dormancy. This can result in long and erratic bloom cycles that ultimately shorten the life of the tree. Fruit set can be spotty. For the most reliable results, match your tree to your region and climate zone. A good local nursery should have solid, climate-specific information and a history of customer experience regarding varieties that do well locally. Cooperative Extension agents can help with advice about chill.

In general, you're wise to stay within the winter chill range of your region, but there are no hard and fast rules here. Chill science is inexact, and pockets of climate diversity, called microclimates, allow trees to grow outside their chill range. A favorite fruit that is borderline might be a candidate for an experiment. Depending on the specifics of each location, unusual or otherwise chancy varieties might be worth a try. Experiments won't necessarily fail. Maybe a tree that produces a few samples of your dream fruit every fifth year will be good enough. Sometimes, trees planted by people who didn't know better do surprisingly well.

Bees transfer pollen blossom to blossom – no bees, no fruit.

Considering Heat

Summer heat may be more important than winter chill. As a rule, summer heat increases the sugar content of fruit, but some fruits require heat and some prefer it cooler. Find out what works in your climate zone. Check with your neighbors. If your neighbors grow apricots successfully, you probably can, too. Be leery of seductive photographs and descriptions found in catalogs, and get the straight story from a responsible purveyor of fruit trees. Most independent nurseries make every effort to be sure their variety selections are appropriate to locale.

SEX AND THE SOLITARY FRUIT TREE

The male part of a blossom, the stamen, must transfer pollen to the female part of the flower, the pistil, to make fruit. Most fruit trees available for sale use their own pollen for this job. These trees are called *self-fruitful*. Some trees require pollen from a *pollenizer*, a different variety of the same tree — a Grimes Golden apple to complement a Gravenstein, for example — to produce fruit, a process called *cross-pollination*. Peaches that need a pollenizer need a different variety of peach. Plums need a different variety of plum. Pluots being mostly plum, need a plum or pluot pollenizer. Apriums being mostly apricot need an apricot pollenizer. Your local nursery or Extension agent should be able to provide information about whether pollenizers are necessary and, if so, which varieties are your best options.

You can borrow the pollenizing capacity of neighborhood fruit trees or even place a container full of appropriate blossoms beneath a flowering tree.

Most people prefer to buy one tree instead of two or more, and fruit sellers comply. Most fruit trees available for sale are self-fruitful, and many are partly self-fruitful, meaning that, with help from bees, a solitary tree can produce fruit on its own. Apples, pears, plums, and pie cherries set more fruit with cross-pollination, even if they are described as self-fruitful, but if your preferred tree is self-fruitful, buy it, plant it, and don't give pollination another thought.

Some excellent exceptions like the Flavor Queen pluot, the Mariposa plum, the Emerald Beaut plum, the aforementioned Yellow Bellflower apple — all worth growing —

require a pollenizer to produce fruit. If your favorite fruit tree needs a pollenizer, it should say so on the tree tag. Some trees need specific varieties for pollination, choices that are associated with bloom time. Check to be sure.

People who avoid trees that need pollenizers miss out on terrific fruit. The corresponding tree should be situated nearby. Bees pollinate flowers and fly long distances in warm, sunny weather but won't venture far when it's chilly and overcast. The closer together you put your trees, the more reliable the pollination, whatever the weather. Close planting (see chapter 2) neatly resolves issues of pollination. You can also borrow the pollenizing capacity of neighborhood fruit trees or even place a container full of appropriate blossoms beneath a flowering tree.

THE VALUE OF APPROPRIATE EXPECTATIONS

At a pruning workshop in Sabi Inderkum and Laureen Asato's backyard in Richmond, California, someone raised the topic of apricots in the East Bay.

"A lot depends on microclimate, but apricot growing is dicey," I said. I told the class they might harvest a real crop every fifth year or so. It often rains while the trees are in flower, so pollination is spotty. Apricot roots are sensitive to the heavy, waterlogged soils common here. East Bay weather encourages brown rot. A relentless cloud cover makes almost every year a bad year for apricots.

I asked Sabi and Laureen how crops had been on their six-year-old Blenheim apricot tree.

Consistently poor, they acknowledged. Only ever a handful.

Laureen's face brightened, and she smiled.

They were wonderful, she said.

Attitude Is Everything

One key to successful gardening has less to do with soil, sunlight, and plants, and much to do with attitude and expectations. If your results match your expectations, you've got it made. Naturally, there's a lot of variability in both what people expect and what plants can do. The closer your ambitions align with what's possible, the more likely your success. Laureen might want to harvest two hundred apricots, and will, one of these years when the weather cooperates. If her goal is "wonderful apricots," however, she succeeded.

When you garden, good results depend on three things: what you expect the plant to do, what the plant is capable of in the environment where you put it, and your willingness to contribute. Fruit growing, while not difficult, improves with participation. One sure way to disenchantment with fruit growing specifically or gardening generally is to relinquish attentive participation.

It's worthwhile to look at expectations and environment in greater detail.

Maybe you have a low-bar objective. You have a space where you want to plant something that doesn't require much attention. This limits your choices but such plants exist. Perhaps your ambitions are greater and you want flowers or fruit. Some of us aim to be the envy of the neighborhood. Fine intentions, all. It's useful to know what you want and what you're willing to do to get it.

Say you want a fruit tree. Reasonable enough. Except that fruit trees make demands on your time and attention. In much of California, growing a Meyer lemon is like keeping a goldfish. Attending to a full-sized apricot is more like looking after a goat. Maybe you want the goat, but you don't want to tend it, so you hire a caretaker. That works fine. Or you decide that a goat is too much trouble. You plant the Meyer lemon. That story has a happy ending, too.

When you want a more companionable relationship and willingly accept responsibility, though, the best arrangement takes the form of a compact. You pay attention and learn what you can. You check in from time to time and care for the needs of your fruit tree yourself — prune when necessary, thin the fruit, watch the water, and monitor pests and disease. With this kind of attention, a connection grows. The tree teaches you about itself. You become acquainted with its seasonal routines. You learn its language, and as you invest more time and your knowledge and skills increase, the bond between you, the tree, and the bigger picture becomes more satisfying. Fruit is only one reward of growing a fruit tree.

When you garden, good results depend on three things: what you expect the plant to do, what the plant is capable of in the environment where you put it, and your willingness to contribute.

Environment Is Key

This final item about a plant's environment should be obvious, but when I started gardening, it wasn't obvious to me. Plants don't necessarily thrive where you want to put them. As a novice, I planted plants according to my preference and with utter disregard for theirs. I installed moisture-loving coastal plants in my arid San Joaquin Valley garden, bearded iris in the shade, and rain-dependent prairie rudbeckia next to salvia in a dry perennial bed.

The characteristics in the different plants we see around us are adaptive. Plants with certain traits survive in response to the demands of their native setting. These variations play out in the backyard. When you observe naturally occurring differences to heat, cold, sun, shade, water, and drought, you stop battling Nature and join with it in a way that works better for you, the plants involved, and even the wider environment. The elegance of these adaptations merits attention, too. Differences are interesting. The feast is everywhere, from a Central Valley vernal pool to the deciduous forests of Vermont. Align a plant to its environment, and you're halfway home.

Trees of Antiquity in Backyard Gardens

Home gardeners have an opportunity to play a role in the protection and revival of heirloom varieties, and the preservation of botanical diversity. The demands of commerce sometimes eliminate old fruit varieties for reasons that have little to do with flavor, quality, or their value to backyard growers. An heirloom that produces superbly flavored fruit might be poorly shippable, not fruit prolifically, or – like the otherwise notable Northern Spy apple – might be slow to bear. Quality fruit might be smaller or less attractive than shoppers have come to expect.

Trees of Antiquity is a mail-order fruit tree company in Paso Robles, California, with a specialty in heirlooms. Owner Neil Collins recommends a few varieties ideally suited to the backyard garden, and we'll get to those shortly. Primary considerations that dictate fruit choice, he says, depend on whether a variety is regionally appropriate, disease resistant, and attractive in the garden. Weather patterns, cold, heat, and in between, always determine how well fruit will do. Disease susceptibility varies greatly from one climate to the next and one variety to the next. Cold hardiness and late bloom are especially important in cold climates. Humidity aggravates disease problems. Even so, there are rare, old, and unusual varieties that suit the mildest climate to the most extreme.

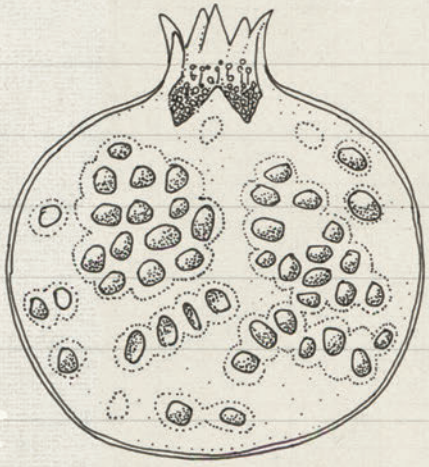
Neil also proposes that we too often undervalue the landscape applications of fruit trees. Moorpark apricots grow to be beautiful trees that produce highly flavored fruit. Seckel pear trees reveal an exquisite limb structure in winter, and the pears are small, pretty, and delicious from the tree without storage. He's enthusiastic about "the gages" for backyard planting. Not to be confused with the Asian greengage, these old European gage plums are sweet, versatile, handsome, and sturdy. Figs create a lush, tropical effect and are easy to grow. Try pomegranates and jujubes if you have drought and heat and are looking for ornamental fruiters. Fruiting quinces have exquisite flowers and a handsome growth habit. To everyone's regret, cherry trees are finicky, fussy about drainage, disease-prone, and need some winter cold to fruit well but are also sensitive to cold and heat. They are gorgeous and delicious, though, if you can get them to work. Neil admires the Grimes Golden apple, a possible parent of Golden Delicious, which offers the benefits of its offspring and a more complex flavor.

Nowhere is the superiority of home-grown fruit more evident than in tree-ripe peaches, Neil says. To start, he recommends Red Havens. They keep you in peaches for a six-week-long harvest period, bloom late, and take the cold. George IV is "one of the three best white-fleshed peaches of all time," with melting, juicy, aromatic, and richly flavored flesh. The Peregrine peach is almost fuzzless and produces excellent flavor even in mild climates.

Prepare yourself for *peach leaf curl* in sensitive regions, a fungal disease that causes leaves of peaches and nectarines to thicken and curl like cooked bacon. Incidents of leaf curl will be now better, now worse depending on weather patterns. The copper fungicides effective against leaf curl are no longer available. Ed Laivo relates that a tent of row cover over small and espaliered peach (and nectarine) trees as the leaves emerge in the rainy season can be surprisingly helpful with leaf curl, and an especially good reason to keep these types of trees small. Peach leaf curl alarms peach growers perhaps more than it should. Adjusting our standards may be the best defense. Remove infected foliage, and treat the tree to some organic fertilizer. Once the curled leaves fall, the tree will grow a new set of uninfected foliage.

CHAPTER 5

the FRUIT TREE COMES HOME

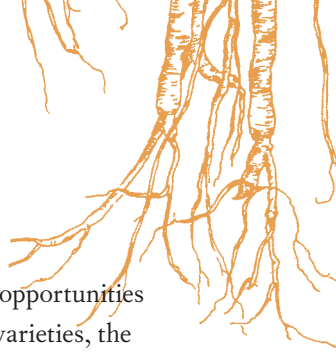


"If I ever go looking for my heart's desire again, I won't look any further than my own backyard."

— FROM *THE WIZARD OF OZ* BY L. FRANK BAUM

FOR A SHORT TIME IN JANUARY AND FEBRUARY in California and a little later in colder climates, deciduous fruit trees are offered for sale *bareroot*. In winter, saplings are dormant and the weather is usually cool and damp. Fruit trees can be dug from fields and shipped direct to you or to nurseries with their roots exposed and unprotected by soil. Most nurseries *heel in* bareroot plants. "Heeling in" is merely horticultural terminology for covering the roots with moist soil so they don't dry out. The young trees are dug back into sand or moist soil and held as they are offered for sale. Some nurseries plant bareroot stock immediately into plastic or pulp containers. Ideally, though, backyard orchardists receive their naked trees in boxes by mail order or go home from the nursery with the bare roots wrapped in moist paper or burlap, or stuffed into a plastic bag.

In winter when the weather is cold and damp, dormant saplings can be dug from the soil and shipped to nurseries with their roots exposed. Once they arrive at the nursery, bareroot trees are often "heeled in" – buried in moist soil for protection.



ABOUT BAREROOT

Without question, bareroot is the best way to buy and plant fruit trees.

Bareroot season offers a first critical lesson in timing. It presents several opportunities on a limited-time-only basis: the best possible price, the widest selection of varieties, the option to plant without added amendment around the roots, and, of critical importance — and thoroughly explained in chapter 6 — the opportunity to prune a young fruit tree properly from the outset. Young trees with unconfined roots establish readily and naturally into garden soil. For reasons of economy and availability, most nurseries bring in their full supply of fruit trees for the bareroot season. In most cases, the trees you find for sale later in the year are bareroot season leftovers.

Attend to New Arrivals

Because their roots are exposed to air, bareroot stock requires immediate attention. The principle concern with bareroot trees is dehydration, especially a problem if winters are unseasonably warm or dry. Moisture in the air helps to keep roots and bark hydrated. A tree with moist bark more easily pushes new branches from latent buds.

It's a good idea to soak bareroot plants that arrive by mail but counterproductive to soak them more than four to six hours. Follow the instructions of the supplier. Plants held in moist soil or sand at the nursery have hydrated roots and should not require soaking, but keep the roots damp and protected for the few hours between nursery and home until they get into the ground. Soaking is of little help if the trees don't get planted in a timely fashion and their roots dry out.

Some bareroot trees come packaged in plastic bags with sawdust, an innovation that serves the nursery (or grocery or big box store) and not necessarily the plant. You get bigger and healthier root systems if you buy your fruit tree from a nursery or a reputable mail-order company — root systems that haven't been pruned to accommodate a small, airless bag. As the season progresses and plants begin to grow, the dicier this packaging becomes.

Plant Promptly

Plant your new bareroot trees as soon as you can. If necessary, rearrange your schedule. Plan to plant a bareroot tree on the day you bring it home from the nursery or as soon as possible after you receive it by mail. Better to leave a bareroot plant in the nursery until

you can get it planted than to risk dehydration if you can't get it in the ground right away. In nurseries and at home, heeling in — covering roots with moist soil — buys time on the hydration front.

The window for buying and planting bareroot trees is necessarily brief. As long as deciduous trees aren't actively growing, they can be held at the nursery until they are transplanted. The object is to get the young tree planted into its new location before too many tender young roots begin to grow in spring. At Scenic Nursery, depending on the weather each winter, Jim Rogers surveyed the progress of the plants. When the saplings leafed out and their roots got too far along, he made the annual pronouncement: bareroot season is over.

CHOOSING A TREE IN THE NURSERY

When we go shopping for plants, our human nature directs us to big plants, right now, to make up for the plant we wish we'd planted five years ago. It's difficult to pass by a plant that looks impressive in the nursery in favor of its smaller and younger sibling. Bigger is better. Except that it isn't. This bigger-is-better philosophy doesn't serve us when we shop in a nursery. If you want healthy plants in the long run, let them acquire their size in the ground.

Small Is Good

When you see plants in a nursery row, don't pick the plant bursting from its container. Choose a smaller one. Buy a one-gallon plant rather than a five-gallon plant. Buy bareroot if you can, or a five-gallon tree rather than a tree in a box. All too often, large nursery plants are compromised by their containers. You're better off choosing a small healthy plant than starting off with a big one, a tactic that also saves you money.

In the case of fruit trees, a thicker trunk suggests age, health, robustness, strength, a better value, and fruit earlier on. However, a thinner diameter — called the *caliper* of the tree — is actually a better choice. Ideally, the trunk of a young fruit tree measures about as big around as your thumb when you purchase it. When I bought fruit trees for Berkeley Horticultural Nursery, I specified five-eighth-inch calipers for this reason. Young, thin trees "break" buds — or start to grow — from a hard prune more readily than older, thicker trees do. Trees only one year older won't take to a cut like this nearly as well.

When you're choosing a fruit tree at the nursery, select one that's about as big around as your thumb.

Obviously, young fruit trees won't look that different from one another once you chop them down to knee-high — no need to agonize about which one to pick. Trees usually develop cleaner scaffolds, or main supporting limbs, if you start from scratch with no branches below the knee-high prune. While I prefer a tree without low branching, if the tree available happens to have established branches below your knee-high cut, this low branching can develop into a nice scaffold, too.

Quality Nursery = Quality Plant

Reputable nurseries and growers sell bareroot trees with established grafts and strong root systems. They won't put them out for sale otherwise. One tree is pretty much as good as another. It won't matter which you choose. Better nurseries also guarantee their plants.

If you have concerns about root systems or grafts — or any other apprehensions — please, have that conversation before you leave the nursery. If you feel confident after a conversation with a salesperson, buy the tree. If not, consider this good rule of thumb for live plant shoppers: never leave the nursery with a plant you have qualms about. Even if the plant is fine or will be fine once it gets into the ground, fretting over a plant tends to undermine your efforts and your likelihood of success.

LOCATION, LOCATION, LOCATION

Fruit trees want your sunniest real estate. My Arctic Glo nectarine grows nestled between two crepe myrtles, the only place left in the yard to put it. When the crepe myrtles are pruned, the sun comes in, and I get good crops. When the larger trees fill back in, yield declines to a disappointing few.

Full sun means unobstructed sun from about eleven o'clock in the morning until four o'clock in the afternoon. Full sun always includes noonday sun. Winter shade when trees are dormant doesn't pose a problem. Before planting your tree, watch the spot and believe what you see. Gardeners too easily fall victim to wishful thinking. I consistently plant sun plants in a backyard area I wish were sunnier than it is. These plants just as consistently disappoint me. In short, plant fruit trees in full sun.

Not in the Lawn, Please

Fruit trees are not ideally situated in lawns. Lawn and trees are natural antagonists. Most rootstock balks at the every-other-day watering lawns on timed systems receive. (Incidentally, the lawns would prefer deeper and less frequent water, too.) If you must plant your fruit tree in a lawn, adjust to a longer and less frequent watering cycle. Or consider a persimmon, a tree that prefers regular watering and is as beautifully ornamental as it is fruitful. Check rootstock for water tolerance, especially in heavy soils. A peach, a plum, or an apricot grafted on Citation rootstock is more tolerant of irrigated gardens. Nurseries with a high percentage of customers with irrigated gardens often choose Citation as rootstock for their stone fruits. Citation rootstock requires regular water to thrive.

Lawn and trees are natural antagonists. Most rootstock balks at the every-other-day watering lawns on timed systems receive.

Apple trees tolerate lawn watering, but too much regular water gives apples and other fruit an undesirable watery quality. Cherry, apricot, and citrus trees are particularly vulnerable to heavy, soggy soils and the lawn-watering schedule. Avoid planting fruit trees at the bottom of a slope, near a downspout, or anyplace where water collects. Most of the time, fruit has better flavor and the trees are healthier if they are sited in locations where they can be watered deeply and less frequently.

Know Your Climate

Those in the grip of what National Public Radio's Ketzel Levine calls "zonal denial" can try to take advantage of microclimates, pockets of conditions like south-facing slopes and reflecting white walls that extend the boundaries of a climate zone. If you live in a mild climate, put your fruit tree out in the open where it can use the little weather you've got, both in terms of heat for the sweetness of the fruit and cold for the purpose of winter dormancy. In cooler situations, tender fruit like citrus might be fine in a warm, sunny, protected courtyard.

As a rule, fruit trees are too high maintenance to make good screening plants or street trees. Fruit out of reach becomes fruit that is rotten on the ground. A fruit slick of degrading plums on the sidewalk is nothing but vile. Plant something more suitable for screening or street trees and keep small fruit trees in another part of the garden.

No Amendments, Please

For years, those of us who worked in nurseries encouraged customers to amend lean soils with bagged organic matter like humus when planting trees and shrubs. We meant well but were mistaken. Soil amendment benefits bedding plants, perennials, and vegetables — in cases where roots won't grow beyond the amended area. Research and experience indicate that most trees and shrubs are better off without it. Roots adapt to the normal soil conditions of your garden.

Soil amendments can be even be detrimental. Roots of plants and trees in unamended soil adjust to native soils. Roots that must transition from potting soil to amended soil, then to regular garden soil have a harder time. The bare roots of a tree in native soils experience no such rude awakenings — a good reason to plant bareroot when you have the opportunity.

An amended planting hole in heavy soil is like a flowerpot without drainage. Fluffy amended soil encourages roots downward into an anaerobic swamp of your own creation. Roots have better access to the air, nutrients, and water that they need if they grow near the surface of the soil. Without the interference of amendments, roots know exactly what to do. In addition, the less you disturb the beneficial microbes that live in the soil and work on behalf of your plants, the better.

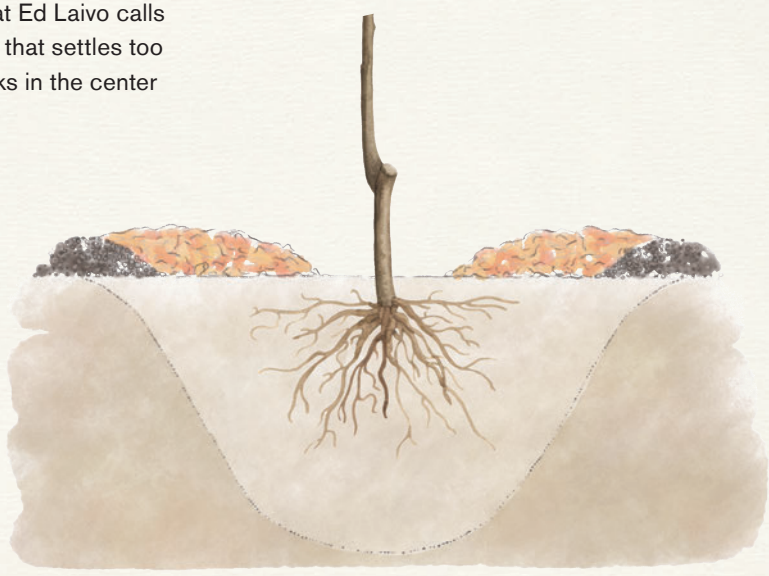
How to Plant a Bareroot Tree

At planting time, dig a wide, shallow hole deep enough in the center to comfortably accommodate the roots. Trim any broken roots and set the tree so it stands in the soil at a point about halfway between the top of the roots and the graft, the knob where the scion – the variety of your choosing – meets the rootstock.

To protect the graft from sunburn, position the outward curve of the graft so it faces south and the concave part of the grafting scar is protected from sun. Backfill the hole with native and unamended garden soil. Push the soil around the roots so it makes good contact. You don't need to be too fussy. You want the ground around the fruit tree roughly level with the surrounding soil. Planting a bareroot tree in a broad shallow hole helps eliminate a tendency to what Ed Laivo calls "the bucket effect" – a tree that settles too deep in the ground and sinks in the center of the hole.

Tamp the soil down. Jiggle the tree to make sure it's stable. Create a basin around the tree by building a four-inch berm to capture water and direct it toward the roots.

Water the tree once with about ten gallons of water to settle it into place. Bear in mind that the undeveloped root system isn't yet actively growing. Once a new tree is watered in, seasonal rainfall usually provides adequate water through early spring. If the weather is unseasonably dry at this stage, five gallons of water every couple of weeks should be plenty.



Planting bareroot gives a fruit tree its best start. Dig a hole that comfortably accommodates the roots and backfill with unamended native soil.

How to Plant Fruit Trees from Containers

You may arrive at the nursery to find fruit trees already planted into containers. These are either last season's leftovers or newly planted bareroot stock that recently arrived. The temptation to buy an established, older tree in a nursery is almost irresistible, but do resist. Fruit trees grow quickly. A young tree is not just a better bargain, it develops into a better tree. Only a young tree takes the hard scaffold prune, and if you miss the window of opportunity to make this pruning cut when a tree is young, it's hard to correct it later.

An older tree in the nursery is more likely to be improperly pruned, if it has been pruned at all. In addition, older trees have been sitting for an entire year with their vigorous root systems circling tight containers and subject to the vicissitudes of the weather and the watering practices of the nursery.

Scenario 1: Treat as a Bareroot Tree

Some nurseries put bareroot stock immediately into containers. If it's early enough in the season – before saplings have leafed out or even if they have leafed out as much as two to three inches – these plants can be barerooted from a container, just as you would pull a tree from a bareroot bin. Pull the tree from its container and shake off the soil. Voilà. You have just restored its bareroot status. Plant the tree according to prior bareroot directions. Protect the roots from dehydration for a few hours if you need to. Planting bareroot is so beneficial, I strongly advise barerooting containered fruit trees; that is, if it's early in the bareroot season and the nursery just potted them up. If this advice makes you nervous, talk it over with your nursery expert. Where I live, bareroot season usually runs from January through the end of February. Check locally to see when bareroot season ends for you.

Scenario 2: Treat as a Container Plant

It's risky to bareroot recently potted trees if they are in good leaf and actively growing, however. Their roots have started growing, too. Wait to plant these trees until the roots have developed enough to hold the soil around them to remove a young tree from its container, probably around June. Unlike dormant roots, actively growing roots suffer fewer setbacks and tolerate transplanting more easily with soil to protect them.

Treat a potted fruit tree as you would any shrub or tree that comes from a nursery. Dig a hole twice as wide as the container and no deeper. Gently remove the tree from its container. Set the tree into the hole and backfill with native, unamended garden soil. Again, for trees and shrubs, soil amendment mixed into the planting hole is neither necessary nor desirable. Plant your tree no deeper than it stands in the nursery container. The soil from the container should be level with the surrounding soil. No garden soil should cover the top of the root ball. Build a four- to six-inch berm of native soil to direct water to the developing roots. Water the tree the first time with ten gallons of water, or about twice as much water as the size of the nursery container. Apply four to six inches of soil amendment as surface mulch.

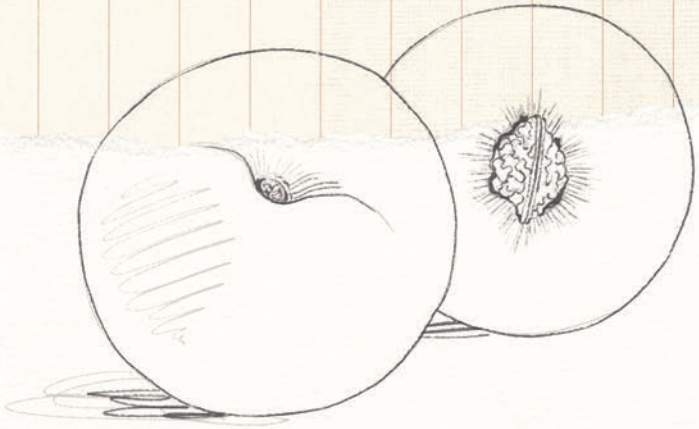
"Can we talk?"

— **JOAN RIVERS**

CHAPTER 6

the CONVERSATION BEGINS:

The Hardest Pruning Cut You'll Ever Have to Make



THE PATH TO A LITTLE FRUIT TREE BEGINS at bareroot planting time with a dramatic *heading cut* that can only be called aggressive. The opportunity to make this pruning cut is an important reason to buy a bareroot tree. A bareroot whip is young enough and slight enough to take the hard prune that a more established tree won't manage nearly as well. While they look impressive in comparison, older trees in the nursery were probably left unpruned or, if they were pruned, pruned too high on the trunk.

Orchard trees branch uniformly from a hard scaffold prune made when they were saplings.

YOU WANT ME TO DO *WHAT?*

Whether your tree is a slender, branchless sapling or the most beautifully branched specimen you could find in the bareroot bin, most fruit trees require a hard heading when first planted. By far, this is the most difficult and important pruning decision you ever have to make, but it almost guarantees fruit tree success, whether you want to keep your tree at six feet or let it grow taller. Your planting job is only complete when you've lopped off the top two-thirds of your new tree.

This pruning cut is critical, not just for size control and aesthetics but for the ultimate fruit-supporting structure of the tree — the supporting branches called scaffold limbs that develop from the buds below this cut. This heading cut is especially necessary if the tree is to be kept small, but even orchard trees are pruned this way. Orchard trees branch uniformly eighteen to twenty-four inches from the ground because they were pruned. If you take a close look at an orchard, you'll see that this is true. Carol and Doug Dillon from Hughson, California, planted their new almond orchard in 2004. Once the saplings were in place, Doug went through the newly planted orchard and cut each of the 850 trees to two feet tall. Three years later they were four feet over his head.

Overcome Your Fear

Even so, the prune is a hard sell. It evokes a natural and paralyzing resistance. It's a lot to ask, especially of novice fruit tree growers who lack experience with pruning. This prune makes nursery managers so agitated most can't bring themselves to do it, even when they know it's in the best interest of both their customers and the future of the fruit trees that leave the nursery. Many nursery workers with good intentions and years of experience hate taking this on. Even experienced pruners and certified arborists balk at the notion of removing more than half of a just-planted fruit tree.

Seriously, though, if you can't bring yourself to make this cut, you may as well abandon your dreams of a fruit tree, pack away your pruning shears, and take up another avocation that won't make such tough demands on your constitution. Take this partly on faith and partly on the explanation to follow, but steel yourself, get out your loppers, and proceed. Everything you do with fruit trees past this point will be gravy. I often encouraged our customers to make this first cut themselves while they were in the nursery, knowing that if they could take this one fundamental responsibility, they would never be as fearful about pruning their fruit tree again.

Steel yourself, get out your loppers, and proceed.

Remember, a heading cut removes the growing tip and awakens the buds below. In its absence, these buds grow into new limbs, each with a growing tip of its own. This heading cut is no exception. The prune is made in winter during the dormant season. It takes advantage of stored nutrients, and the vigorous growth and branching that occur in spring when the plant's energy is directed to these remaining buds — the perfect combination of conditions to get a just-planted tree off to a strong start.

Four Reasons to Make the Cut

This hard-line pruning cut accomplishes four important things:

1. It removes upright growth that hormonally curbs the growth of lower limbs. The cut makes it possible for lower limbs to grow. The upright growth removed is not usually fruitful or strong enough to support fruit and, ultimately, creates shade that inhibits the creation of the fruiting spurs and eventual fruit production.
2. It radically alters the form of the tree. This cut either opens the center of the tree or it creates a new central leader (the vertical trunk or spine of the tree), if the tree prefers to grow that way. Open centers and central leaders are explained more fully in chapter 7.

Before

A workable fruit tree begins with a radical prune that removes the top two-thirds of the young whip.

After

3. It creates a low scaffold and spreading growth that is more fruitful and gives the tree strength and resilience it wouldn't have otherwise, especially critical for stone fruits. As a fruit tree caretaker, the pruner has a responsibility to build sturdiness into a fruit tree, strength that begins with this cut.

4. It establishes a pattern of low branching, which helps to keep the canopy of the tree within reach of the pruner.

A perfectly branched bareroot specimen in the nursery tempts a fruit tree planter to avoid the initial prune and let the tree grow naturally. To put it in the plainest possible terms: this is a mistake. Like children or puppies, fruit trees absolutely require structure, training, and shaping. If you let it go, your innocent little tree soon becomes a thicketing monster, prone to breakage, fruiting erratically beyond your reach, then dropping that fruit to putrefy on the ground, even if you bought a semidwarf to avoid just these consequences.

Why Aren't Nursery Fruit Trees Pruned Short?

If an initial hard pruning cut is the right advice, you might ask, shouldn't fruit trees come pruned this way already? In the best interest of backyard fruit growers, yes. Fruit trees should probably come with an initial prune, much the way roses are pruned for winter sale, but wholesalers, retailers, and other purveyors of fruit trees aren't likely to make this cut for you.

Why not? For one thing, it's hard to sell a fruit tree that's an eighteen-inch stub. We're not used to seeing fruit trees this way. Many fruit tree sellers don't know what fruit trees require, and for others it's just plain hard to do. Until you personally experience the results of this prune, it intimidates everybody, even professionals, and often especially professionals.

I liked to sell the uncut trees because they gave me the opportunity to talk to each and every customer about my favorite subject. With an uncut tree, the customer chooses the height of the scaffold. Knee-high is about right. There are reasons for slightly higher scaffolds and slightly lower ones. People with different plans and situations deserve options.

Buy a skinny bareroot tree. Make a knee-high cut in winter as soon as possible either in the nursery before you put it in the car, or as you plant it using the directions in the previous section. The resulting low-branching, open-center tree will grow to be shorter, stronger, easier to care for, and far more usefully fruitful.

THE VITAL PRUNE AND HOW TO MAKE IT

If you make the cut at the nursery, your new fruit tree fits neatly into the car and you might get help from a trained professional (not that you need it). If you plant the sapling and then make the cut, your knee provides a handy yardstick. In other words, what matters is that you make this cut in a timely fashion, when the tree is fresh from the bareroot bin and still dormant, not where you happen to do it.

Knee-High Is Just Right

Prune a thumb-size whip so it stands — or will stand once it's in the ground — knee-high or no taller than twenty-four inches. Granted, this sounds harsh and contrary to common sense. Do it anyway. The sapling is young and dormant.

You won't have a better opportunity. The best structure for the tree-to-come develops as a consequence of this pruning cut. A young tree will probably be a five- to six-foot whip at the nursery. In most cases, if you make the cut properly, you remove more than you leave behind.

The buds on the young trunk look a little like the eyes of a potato. They spiral around the sapling. The place where you make the cut becomes the crotch of the tree once it has established. The trunk will not grow taller. The lower the crotch, the easier it is to keep the tree small. A knee-high prune is reasonable for almost all fruit trees, even if, for some crazy reason, you want to let your tree grow to fifteen feet tall.

Make a clean cut that angles at about forty-five degrees with the bud you've chosen to be the top bud. Make the cut close enough to the bud so the cut can heal cleanly in a natural line, but not so close you cut into the bud itself. Several buds should remain below the cut and above the graft, the knobby place on the trunk where the rootstock meets the scion, the variety of the tree you've chosen to grow. (See page 24.) Your beautiful sapling will now be a knee-high stick. Fed from dormant season resources stored in the roots, an open starter scaffold will form by summer.

A nicely branched sapling encourages fruit tree planters to avoid the hard scaffold prune. This is a mistake.

The First Spring

Taller prunes can be made lower the first season. People who cut their trees higher, say at three feet, often report back with the wish for a shorter tree and a lower scaffold once they take in how alarmingly fast the trees have grown. This situation is easily remedied in the spring of the first season. By the second year, it's a different story.

Once the first-year buds start sprouting, simply prune lower to a place where the configuration of leafing buds suits you. The earlier in the season you make this second cut, the more vigorously the new limbs will grow. (See page 95.) In some instances, it's appropriate to make the first cut higher, with an intention to make a correction as soon as buds begin to develop. A plant with a stem thicker than three-quarters of an inch may have a harder time pushing buds, for example. Cut it a bit higher, where the caliper is thinner, and then, when branches sprout, take it down to sprouted buds lower on the trunk. Peaches and nectarines sprout more reliably if you cut above a *nurse limb*, a branch left below a scaffold prune to encourage sprouting. Once the lower sprouts get going, you can take the scaffold as low as you choose.

A nurse limb encourages sometimes balky peaches and nectarines to sprout.

In any case, planting a bareroot sapling gives you the best opportunity you'll ever have to build a well-structured fruit tree. Don't talk yourself out of it. Don't wait. Next year will be too late. Because this pruning cut is so important and so psychologically discordant, at Scenic Nursery and Berkeley Horticultural Nursery we liked to leave trees uncut in the bareroot bin until we could explain the logic of the prune, and then prune the fruit trees for our customers before they left the nursery. This practice is rare.

A Few Exceptions

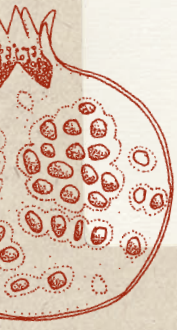
Almost all deciduous fruit trees take the hard prune, and most require it to be strong and productive. Citrus is an evergreen shrub and won't need this kind of pruning. A few other exceptions follow.

Persimmons

If allowed to grow tall, persimmons become elegant landscape trees with brilliant fall foliage and a bright display of orange fruit that hangs in the bare tree well into winter. The decision to prune depends on your intentions. Persimmon trees can be pruned to a low, open center and kept short if you want them primarily for fruit or if you'd like a small ornamental tree for the garden. If you want them taller, persimmons develop a lovely open shape when you make some sort of a scaffold prune, either low or higher, but the prune isn't necessary.

Pomegranates

A pomegranate grows more like a large, thicketing, arching shrub than a tree. It is beautiful in the landscape with attractive flowers and fruit. The plant stays naturally at about eight feet. The best approach preserves the integrity of the arching quality of the plant and provides the thickets with space between one another. Remove upright growth at the base to keep a pomegranate airy and in bounds.



Weeping Plums

Weeping Santa Rosa plums are also attractive landscape trees that stay naturally small. The fruit of a Weeping Santa Rosa ranks higher than regular Santa Rosa fruit in taste tests, but I haven't made the comparison myself. If unpruned, the plant grows to be an eight-foot haystack. To prune, stand beneath the canopy in winter or summer and create space between the branches with thinning. A low or higher scaffold prune gives the tree some shape. Branches weep from the scaffold limbs that develop. Weeping Santa Rosas make excellent espaliers. A customer once returned a Weeping Santa Rosa with a thick caliper that had sprouted from only two opposite buds. We replaced it with another and potted up the offending tree. By the following spring, it evolved into a willowy cascade of blooming foliage that we were able to sell for a premium price.

Multiple-Graft Trees

In the case of multiple-graft trees (the three-in-ones and four-in-ones), wait until summer and prune the tips of branches back to keep trees from getting too tall. Because of the way these trees are grafted, a knee-high prune leaves you with nothing but rootstock. See chapter 2 if you want to train an espalier. Leave just-planted, grafted espaliers unpruned at first. They grow straight up from the tips and along their horizontal branches. Prune this upright growth in summer.

MAKING CORRECTIONS

If you didn't make the scaffold prune when you first bought your bareroot tree, you lose the inherent advantages of youthful recovery and the strong response from the winter cut. You can take corrective measures through the first growing season and sometimes even later. Bear in mind, though, that corrections are just that, making the best of a less-than-ideal situation. Large cuts on older wood heal more slowly. The resulting form will never be quite as satisfactory as it could have been.

Situation #1: The Tardy Prune

You didn't know about the hard scaffold cut and you planted a bareroot sapling without it. In this case, during the first summer around the time of the solstice, cut out the central leader (the vertical trunk or spine of the tree) just above the best set of naturally occurring scaffold branches, even though it's summer. The "best" branches are placed more or less evenly around the trunk. If your sapling has branches like this occurring at or below knee-high, great. If the branches are higher, the higher scaffold makes it harder to keep the tree small, but a prune this first summer still results in a stronger tree. This prune redirects a tree's growing energy to the limbs that remain. The scaffold won't develop in summer with the vigor of the winter prune, but it's better than not pruning at all. If you miss the solstice, this prune can also be made the first winter, but rarely later than that.

Situation #2: The Do-Over

If you didn't make the cut the first season or if you cut the scaffold too high, consider the possibility of a do-over the following January. Winter pruning results in vigorous growth. Take advantage. I decided to take down a too-tall pluot scaffold the following winter. I cut off the scaffold that had formed the year before. This left the plant knee-high and without branches. The trunk was an inch and a quarter thick, too developed by the second year to break new buds very well, but a strong root system had established itself and stored enough energy to give the tree a good push. This second prune delayed fruit production a year. The tree is somewhat one-sided. It lacks the grace it would have had with the original scaffold, but it's a tree I can manage. With a do-over, the smaller the caliper, the more easily the tree takes the lower cut and the better your chances for a balanced scaffold. If the tree is unpruned at a year or two, you can sometimes prune out the central leader above lower branches to create a more open, sunlight-friendly form.

Situation #3: The Too-Big Tree

You have a tree on your hands that's much too big. You wish it were smaller. Sooner or later in every workshop someone always asks: Can I make my big tree small? The answer to this all too common and tragic question is, most likely, no. By the time a tree is established, all you can do is damage control. While full-grown trees can be made smaller (my exasperated neighbor took the chain saw to his twenty-five-foot apple tree), it's one thing to train a tree to be small from the outset and quite another to rein one in.

If you have an oversized tree, the rule of thumb is to take it down a third at a time, each third evenly distributed throughout the canopy, over a period of three years. This probably isn't a do-it-yourself project. Call a certified arborist with fruit tree experience. My neighbor is a former logger who follows his own rules. He sawed off the entire canopy of the tree in January. The tree recovered more gracefully than I expected. It still branches at about five feet and won't produce fruit for three or four years.

Consider certain aspects of the tree in question before embarking on either course of action. For instance, will the resulting tree be small enough? From a practical standpoint, a twelve-foot tree isn't much smaller than a fifteen-footer. You still need a ladder. Bear in mind, too, how your newly reduced tree will look in the garden. Radical pruning can destroy a tree's form. Do you want to preserve the tree because the fruit is rare or especially flavorful? Is the tree aged? If the tree is old—twenty years for stone fruits and, in mild climates, forty to fifty years for an apple or pear—a more reasonable decision might be a plan to eventually remove the tree and begin again with something you can train to be much smaller.

Even if the tree isn't old and you just want something smaller, it often makes sense to get a new tree going and remove the too-big tree when the young one starts fruiting. Fruit from a new Burgundy plum that you prune to keep small from the start will taste the same as fruit from a Burgundy plum that has outgrown your garden space and your energy level. The new tree takes only three or four years to bear. On rare occasions, a tree has sentimental value that trumps practical considerations. If this is the case, call an arborist.

Most people have an understandable reverence for trees and are loathe to remove them, but trees are not created equal, especially in limited garden space. You can spend a lot of money and effort trying to save or alter poor performers, be they misplaced, overgrown, or abundant producers of marginal fruit. Sometimes, tree removal is the best option. Plant a new tree that better suits you.

A Tiny Backyard Orchard

Alison McKee, my colleague at Berkeley Horticultural Nursery, grew up on a sheep farm in Maine, with apple trees on her family's property and pick-your-own orchards all around. She knew what a good apple tasted like and objected to the apples she encountered in California. In her West Coast exile, her parents shipped apples from home. She longed for two things: independence from renting property and fresh-picked fruit. With that in mind, she bought a small bungalow in Richmond, California, with a tattered but promising backyard. The house needed a new foundation, a detail that could be worked out in time.

Meanwhile, Alison had food to grow and fruit trees to plant.

The benefits of reduced fruit production made sense to Alison. Timed harvests for fresh fruit most of the year and maximizing space with small trees and close planting appealed to her. What better reason to live in California? Her backyard wasn't huge, twenty feet wide and forty feet deep, but she had sun all day. The concrete patio and a shabby lawn went first. She hacked out old and overgrown shrubbery. She granted dispensation only to an existing Brown Turkey fig.

Alison planted a bareroot Santa Rosa plum the first winter. She had solid nursery experience and horticulture training from Merritt College in Oakland. Bright, interested, and a competent pruner, she knew her way around plants. She had enough experience to think that while the idea of a knee-high prune for her new plum tree might have merit, she felt it was, as she put it, "unnecessarily rash."

Perhaps the cut had value. I insisted it did. She compromised with a waist-high prune when her bareroot whip first went in the ground. Her Santa Rosa grew energetically, as plums will. The tree was over her head that first season and got completely away from her in year two, growing to ten feet tall and commandeering her precious garden space with height, width, and shade. By year three, she had had enough. She took the tree down and started over.

Ten years have passed. Alison harvests figs, persimmons, and oranges from her small backyard garden. She grows a plum and a pluot planted eighteen inches apart and pruned away from one another, as if they were a single tree. She grows two pears, a Bartlett and a 20th Century Asian pear, and keeps all these trees only a little taller than she is. After the plum debacle, she cut each new bareroot tree at only six inches above the graft. Up against the fence, a Gala apple stands five feet tall and easily produces a hundred apples, as satisfying as the apples from Maine, in part, at least, because she grows them herself.

Alison lost an apricot tree to waterlogged soil one rainy winter. She just planted another. She took out a nectarine because the fruit didn't get enough heat in Richmond to ripen well but considers her other experience with small trees "entirely positive." The trees are "no trouble at all," she says. They're fun to prune. She does little in the way of dormant spray or insect control. The fruit is easy to harvest. She shares her harvest with friends and birds. She says that there's nothing to it and loves having taken fruitful advantage of such a tiny space.

CHAPTER 7

the CONVERSATION CONTINUES

"... to hearken to what is said
and to answer to the purpose."

— BENJAMIN FRANKLIN

PRUNING HELPS ADDRESS THE BUILT-IN DIFFICULTY of most fruit trees to carry a heavy crop of fruit. It builds a strong and shapely tree. Early pruning (or the lack of it) dictates the course of growth for a tree's entire life. Once the consequences of the initial hard prune reveal themselves, the pruning conversation really begins. The first prune encourages the low branching that makes a short tree possible. It reconfigures the tree to create either what is called the *open center form* or the *central leader form*.

Some fruit trees insist on a central leader.

An open center form is the easy choice for most fruit trees.

OPEN CENTER VERSUS CENTRAL LEADER

You rarely go wrong with open-center pruning. Most fruit trees easily manage this type of structure. Most people do, too. Rose pruners will find the vase-shaped structure of the open center form familiar: frequently compared to an open hand, fingers spread and extended up.

Fast-growing stone fruits like plums, pluots, peaches, and nectarines are better off with open-center pruning. They are too brittle to manage a central leader very well.

In some cases — usually with pome fruits, but not always — the low prune is also used to activate a stronger trunk in the form of a *central leader*. In this case, the top bud grows vertically to become the new center trunk, from which side branches called *laterals* will grow. Traditionally, the central leader method gave strength to fruit trees like apples and cherries that allowed them to grow large. Fruit trees were pruned into a central leader form, shaped with lower branches wide like a Christmas tree or ballerina's skirt.

Trees pruned to be small in either style are strong and fruitful.

In my garden, I usually prune for an open center, but lately a young Hudson's Golden Gem apple expresses its preference for a more upright form. If vertical branches insist on being vertical no matter what you do, your tree might be suggesting a central leader. The tree is only in its second year. We continue our discussion. I'm not sure which style will prevail.

When trees are kept small, open center versus central leader is more of a question of style than substance. Does pruning style matter to the tree or its fruiting capacity? Not really. Trees pruned to be small in either style are strong and fruitful. When trees are kept small, the shape of each style merely provides a different method for a tree to collect the sunlight it needs to produce fruit. Central-leader trees have their width at the bottom and collect sunlight from the outside. Open-center trees have their width at the top and collect sunlight throughout.

PRUNING THE FIRST SUMMER

In your fruit tree's first spring in the garden, the buds below the initial hard prune burst from dormancy. As a result of that cut, the top three or four buds will be well on their way to developing into scaffold branches by summer, in the form of new shoots that can be anywhere from eighteen inches to five feet long. Follow these steps the first spring and summer.

Step 1: Reduce multiple leaf buds to one bud each.

Revisit the young tree in early spring just as once-latent buds have begun to sprout, probably around March or April. Two or three leaf buds often emerge from the same leaf node, buds that will grow into branches if you let them. For a tidy result, use your fingers to gently remove all but one of the multiple buds early in the season when the buds are about a quarter-inch long and before branches have begun to form.

Which buds go and which buds stay? Take your pick. If two buds grow from the single node, remove the wimpier sprout or choose your preferred direction for future growth. If there are three, removing the side buds and preserving the center satisfies my sense of order, but honestly, it doesn't make a bit of difference. You can work with whatever develops.

Congratulate yourself. By limiting one branch to each node, you made a pruning decision. In combination with the first heading prune, these simple actions lay the foundation for the developing scaffold. You're done for now. Revisit the tree in June and begin with Step 2.

If you missed the debudding and find when you visit the tree in early summer that young limbs have already developed two and three to a bud, no matter. Prune out the extra shoots now. Remove all but one branch wherever two or more branches emerge from the same bud. The only downside to waiting is the little stub left behind. Either method eliminates competition and strengthens the limb that remains.

Early in spring, use your fingers to gently remove all but one bud where multiple buds grow from a single node.

Remove rootstock suckers and any sprouts at the graft.

Step 2: Remove rootstock suckers.

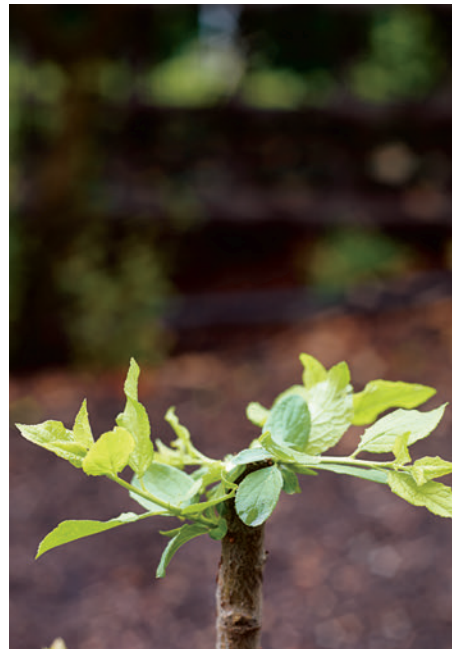
The next pruning decision is even more straightforward. Prune off limbs that sprout at or below the graft. Any shoot growing below the graft is definitely rootstock. Rootstock can be aggressive. Shoots growing from rootstock divert resources and sap energy from the top-stock. More to the point, rootstock won't produce decent fruit. Removal of root-stock suckers directs all the tree's energy into the scion, where you want it to go. Young shoots growing right on the graft are suspect. These could be either root-stock or scion. Clip them off.

Step 3: Consider the current scaffold.

By early summer, young limbs have begun to establish themselves with more or less vigor. Most often, the top buds sprout into a reasonably well-formed scaffold. In a perfect world, the young tree develops three or four branches evenly spaced around the trunk. If this happens, great. In the real world, however, branches break any way and anywhere they please. Sometimes, after the initial heading, one or two top buds remain inactive, leaving a stub above lower sprouts. If this occurs, make a clean forty-five-degree prune near the top branching bud. The cut becomes the crotch of the tree.

In addition, all sprouts that result from the first prune give you new choices. Take this opportunity to consider whether your first cut was low enough. If you're happy with developments, leave things as they are. Consider, though, that this is your best chance to drop the scaffold for lower branching and a shorter tree. Remember, the lower the scaf-fold, the easier it is to keep the tree shorter. If the idea of a lower scaffold appeals to you now, and it might, make a new prune — a clean forty-five-degree angle at a point above three or four nicely spaced branches.

If the idea of an even lower scaffold appeals to you, cut above three or four nicely spaced branches.



The scaffold can be pruned lower once leaf buds have sprouted.

These early decisions clear away many of the complications that make pruning confusing. For one thing, they answer the question of where to begin. And once you begin, it's easier to keep going. For another, they remove detritus that gets in the way of seeing the tree clearly. Step back. Take notice: the tree already looks cleaner and more like itself. This type of attentive observation serves you well as you continue.

Now to contend with the branches that remain.

The "niceness" of spacing relates to the placement of the future scaffold limbs in relation to one another. You may have too many choices or not enough. You might have bare areas with no branching at all. In any case, you work with what you have.

Step 4: Imagine the future.

Consider the placement of the future scaffold limbs — the top three or four branches that emerged from the hard prune — in relation to one another. You may have too many choices or not enough. You might have an open area without branching. Regardless, do the best you can.

Aim for ideal placement as you look down from the top of the little tree. Choose the three or four branches that come closest to your ideal; usually they are branches that radiate more or less evenly around the trunk. Ideally, branches are spaced evenly up and down the trunk, too. Remove one of any two branches that are too closely spaced. Prune so only three or four branches remain. Shoots above the graft, even if they're low, belong to the scion and will produce the fruit you're after. If you don't mind a low placement or need them for the scaffold, leave them. While it's tempting to let Nature take its course, leaving too many branches in place promotes an undesirable shrubbiness that confuses the form and keeps sunlight from penetrating the interior of the tree.

An ideal branch angles at about forty-five degrees — horizontal enough to create fruiting spurs and angled enough to support the weight of fruit. Sometimes limbs cooperate, and often they don't. When you make decisions about what to keep and what to remove, favor this angled branching and remove limbs that are too horizontal or too vertical. If you need to preserve a too-vertical branch for reasons of spacing, use a heading cut above a bud that sends growth in a more horizontal direction, or you can use weights and spacers to change the angle of the limb.

One task of pruning is to envision the future. If you're uncertain, tag limbs you might want to keep with blue masking tape and step back to consider your choices before you cut anything off. How are the branches spaced? In which direction will they grow? Picture them older, thicker, and performing their future functions as the primary structures of the tree.

Let me emphasize again that there are no right or wrong answers on this particular quiz. The options your tree offers won't be perfect. Prune to encourage branching to fill empty spaces as the tree grows, and prune away competing limbs to create spaces. You can build something workable (and fruitful) from almost any configuration the tree presents to you.

The ideal is for branches to be spaced evenly around the trunk.

How to choose what to keep and what to prune? It doesn't much matter. Some branches will seem more worth preserving to you than others. Remove one of any two redundant branches — branches that grow closely together in the same or approximately the same direction. Which one? Make your best guess. Prune off the branches that don't fit into your plan. If you don't have a plan, the branch that stays behind becomes your plan. Someone else might choose differently, but you hold the shears; your opinion is the one that counts.

It's fine to favor a slighter but well-placed or well-angled branch over a more robust one. Slight branches become robust in time. It's also fine to favor the more robust branch, even if you feel that its placement is merely satisfactory. The tree won't care. Imagine each limb's future. Consider the tree with the alternate limbs missing. Ask yourself what seems best, listen to your own good opinion, and cut something out. These choices are entirely up to you and not nearly as consequential as you fear.

Remove one of two redundant branches; to the tree, it doesn't matter which.

The tree responds. You watch what happens. You learn. The tree grows and creates new choices for you in the form of new branches. You can always make adjustments and corrections next time. It won't matter to the tree. It won't make any difference to you, either, a couple of years from now when the tree starts fruiting and the nuances of these early decisions are long forgotten.

Step 5: Shorten branches.

Finally, once extraneous branches are removed, head remaining branches back by at least half to a bud that faces the direction you want the branch to grow.

Heading Back Branches

After removing redundant branches, head back remaining branches by one half to two-thirds, to a leaf node that faces away from the center of the tree.

PEACH TREE

Before

After

APPLE TREE

Before

After

With this cut, the branch grows from the top bud and creates new branches at the point of your pruning and below, though not nearly as robustly as it would have done from a winter prune. Summer pruning moderates growth and begins to acquaint your tree with the idea of its forthcoming short stature.

In the case of aggressive growers like apricots and plums, feel free to prune by two-thirds, especially in summer. How to define aggressive? If the amount of growth put forth from January to May astonishes you — that's aggressive. These summer heading cuts encourage spread and create new branches at the point of your pruning and below, branches that will grow with appropriate moderation because you do this pruning when the tree is in leaf.

For a miniature version of the classic vase-shaped orchard tree, prune off the tops of main upright limbs to an outside bud, or leaf node, that faces away from the interior of the tree. By summer, the outside bud has usually produced a leaf. Prune just above the leaf. For central leader trees, the top bud grows upright. Choose three to four evenly spaced branches below. Shorten those and remove the rest. If your tree is a variation on classic themes, like flat fans along a fence, pick a bud with a direction that suits your purposes. The tree continually generates new growth to work with.

As Ed Laivo says, "You don't need a bunch of fancy rules to do this." In fact, you become a better pruner if you leave the rules behind.

Be assertive, especially with fast-growing stone fruits. This emphatic pruning, early on, builds needed strength into the tree. Stone fruits take harder pruning and, in the first year and beyond, often require additional attention in August. Check late summer. If your tree looks like it needs pruning, prune it. And while pome fruits like apples, pears, and quinces have inherent strength because they grow more slowly, early shaping determines the course of growth for the life of the tree.

Attentive pruning builds the tree that works in your particular garden. You may want a flat side against the house. Remove branches accordingly. Two-dimensional trees have creative uses, too. Prune to consider the path. Clear the interiors of closely planted trees so that they don't bump into one another. Treat two or three trees planted in close proximity as if they were a single tree. Prune the main branches so that they grow apart from each other with open space in the center.

Weights and Spacers

When branches are young and supple, you can encourage them to grow more horizontally and, consequently, more fruitfully by using spacers like clothespins or short lengths of branch from your trimmings. Promoting strength and fruitfulness, a forty-five-degree angle is the ideal angle for an unsupported branch. Master Gardener Dennis Miller in Pine Grove, California, introduced me to a nifty method of weighting limbs that uses plastic water bottles. Attach thick, coated wire – it won't harm bark – around the neck of the bottle. Then, form a loose homemade "s" hook to loop over the errant branch. Adjust the water content of the bottle to change its weight. He keeps a group of these bottles hanging ready at his garden gate. It doesn't take more than a few weeks to alter the growth habits of young limbs.

When trees are young and supple, spread upright branches with branch trimmings or weight them with water-filled bottles. Branches encouraged to grow more horizontally will be more fruitful.

INTO THE FUTURE

The most important advice for pruners in early (and later) years is to keep pruning: make architectural decisions in winter, take height down around the time of the solstice, and do a follow-up prune in late summer if that seems appropriate. As Ed Laivo says, "You don't need a bunch of fancy rules to do this." In fact, you become a better pruner if you leave the rules behind. Specific methods can be more of a hindrance than a help — even the methods advanced by this book. Too much attention to the printed word or a picture of an idealized tree or a photograph of a tree distinct from the one in your garden keeps you from listening to what your own tree has to tell you.

A fruit tree's first year pruning gives it the basis for its future form, a form you yourself determined by the pruning decisions you made so far. In years two and three, your pruning builds upon and supports that form. By year four and thereafter, pruning attention shifts to maintenance.

Pruning the Second Winter

The second winter pruning answers a tree's response to the first summer prune. While the leafless tree reveals its structure, prune lightly to support and encourage an open, airy quality by eliminating branches that get in the way. Clean things up.

Remove water sprouts first, if you have them. Water sprouts shoot vigorously upright. They grow faster and more greedily than ordinary limbs. They often grow from last season's pruning points. Their abundance, aggression, and extra wide spacing between buds should make them obvious. Water sprout removal is a good first step. It clears away confusion, provides definite progress, and gets you warmed up. If water sprouts aren't obvious, don't worry — there may not be any. If you feel uncertain about whether a limb is a water sprout or not, leave it, and proceed to the next step. In fact, if you ever feel uncertain, turn your attention to different branches or a different area of the tree. When you return to the original point of confusion, you'll see it from a new perspective. You can use your powers of persuasion more forcefully next January, when you have more experience with consequences.

Now, take a look at what remains.

Evaluate what has transpired since last summer's prune. Remember, winter pruning corrects the shape of the tree. Some limbs have undoubtedly grown toward the center. Other limbs cross and crowd each other. Any of these can be candidates for removal. Part of your job now is to create space. What looks out of place?

Imagine the absence of limbs you'd like to remove. Imagine the future of limbs you'd like to keep. Use blue tape if you find that helpful to your imagining. Now use thinning cuts, branch by branch, to begin to clear crowded and duplicate limbs. Make decisions as you go. The removal of any branch changes the pruning dynamic. Pruning is an active process with no right answer. Assess your progress as you proceed.

On a young tree, I rarely remove more than three or four limbs — thumb-width or wider — in wintertime. Leave short twigs in place, unless they're undesirable for some obvious reason. These twigs have the potential to develop into useful branches and are often early fruiters. They can come out next time, or the time after that.

Prune to create vigorous growth. Winter is the best time to take advantage of vigor if you need it. Hard pruning promotes additional vigor to use or not, depending on your intention. While it seems counterintuitive, hard pruning in winter encourages weak but useful limbs to better compete with their more vigorous cousins. These weaker limbs catch up when they can take advantage of the power of the winter growth response. Prune robust branches less aggressively to slow them down, or don't prune them at all until summer. Use cuts above leaf nodes to direct growth where you need it.

Save upright branches for summer pruning. In the interests of size control and efficiency, I reserve the pruning of regular upright branches for summer. If you can't yet tell the difference between a water sprout and an ordinary limb, don't worry. Winter or summer, if a limb looks out of place, it is out of place. Trust your judgment. If a branch bothers you, prune it out and watch what happens.

If you decide that your judgment was skewed for some reason, and you remove something you wish you'd left alone, don't agonize over it. The tree will grow new branches and give you different options. In time, you forget that early missteps ever occurred. If you're confused, tread lightly until you gain more experience. You develop confidence based on the observation of your pruning conversation as it progresses.

By the second winter, the tree will have developed the upright branches that form the vase of your vase-shaped tree. As tall and vertical as they may be, these are probably branches, not water sprouts. I like to leave these for summer pruning. If you prune tall branches shorter now, you generate a forceful growth spurt and that will need repruning in summer. These limbs often bother winter pruners. If you must make them shorter for either your sense of aesthetics or peace of mind, it doesn't hurt to prune them now. Their regrowth merely gives you more to prune in summer. Just remember, winter pruning works best to shape a tree. It never keeps it smaller.

OBJECT LESSON: First Year with a Mericrest Nectarine

I bought a Mericrest nectarine at my local Ridge Road Nursery in Pine Grove. Why Mericrest? Arctic Glo blooms too early for the Sierra foothills. Truthfully, it was the nectarine they had, late blooming and cold hardy with great reviews about its tangy flavor. Subacid fruit is not for me. This small, reputable nursery has longer experience with the foothill climate than I do. The nectarine was grafted onto the Lovell rootstock I knew I wanted, best for my low-water garden.

I planted the bareroot Mericrest in the middle of February and pruned it roughly knee-high, leaving the nurse limb that is a good idea with peaches and nectarines (see page 93) – they sometimes have a hard time sprouting. By late April the tree had started to grow – two sprouts on either side of the nurse limb, one on the main trunk opposite, and three sprouts low near the graft. Not ideal. Ideally, the tree would sprout evenly around the trunk near the cut. Two or three shoots emerged from each bud. In April, I culled these down to one apiece. By mid-May the remaining shoots were already about a foot long. The first prune took place on June 24, just after the solstice.

None of the pruning decisions I made that June were necessarily "right." They are merely what I decided to do given the choices at hand. My decision-making process went something like this:

A heading prune at planting time creates leaf sprouts that become scaffold branches.

1. I could cut the center trunk down to the three low sprouts, which are perfectly positioned in relation to each other. Looking down from above, I imagine the limbs as they radiate from the trunk dividing a pie. The three low limbs divide the chart into equal slices of pie.

   Perfect, except that this puts the scaffold branches about eight inches from the ground. This height is fine as far as the tree is concerned, and if it were a solitary tree in the garden, I'd probably cut out the central trunk to create this low scaffold. The tree is part of a small orchard, though. I want the trunk height to match the other trees, an aesthetic consideration rather than a horticultural one.

I leave the center trunk and the nurse limb as they are, even though one of the limbs that divides my imaginary pie is very low on the trunk. I may end up with only two scaffold branches, or two high and one or two low. I don't have to decide right now. I wish I had three higher branches positioned evenly around the tree. I don't.

2. I remove one of the two opposite sprouts on the nurse limb to strengthen and simplify the scaffold, and take a dead stub with it.
3. I thin out skinny twigs that grow toward the nurse limb from the opposite sprout. They crowd what I'm trying to develop as an open center. I leave a skinny twig that grows away from the center.
4. I cut back the top two shoots – the one that grows from the nurse limb and the one opposite – by two-thirds to leaves that face outward. I leave all three low branches on the trunk for now. They might be early fruiters. I head them back by two-thirds to leaf buds that face away from the center. I can cut them off later if they start to get in the way.

Prune away growth that crowds and clutters an open center.

Summer Pruning

We created space and thinned crowded branches to improve form, to let sunlight into the tree, and for increased air circulation. Using thinning cuts, we removed branches to flatten the back of the tree to accommodate the fence, then headed back the upright growth by about a third overall, to keep the top of the tree within reach. Is there fruit on your tree? Prune anyway.

Before pruning

After pruning

PRUNING THE SECOND SUMMER AND BEYOND

Return at solstice. First and always, appraise the tree and note what looks wrong: either too tall, too crowded, or both. Consider the height of your reach. Prune accordingly. Head back tall, vigorous growth to outward-facing buds. Prune upright growth by a half to two-thirds. As the tree ages and gets bigger, you may want to remove some upright limbs entirely. Shaping and thinning cuts are perfectly appropriate in summer. If you see something that cries to be corrected or pruned away, prune it. As always, prune out limbs that annoy you. Picture the height of the tree you have in mind. Don't allow the tree to get taller. As Scenic Nursery's Jim Rogers would remind us, "insist."

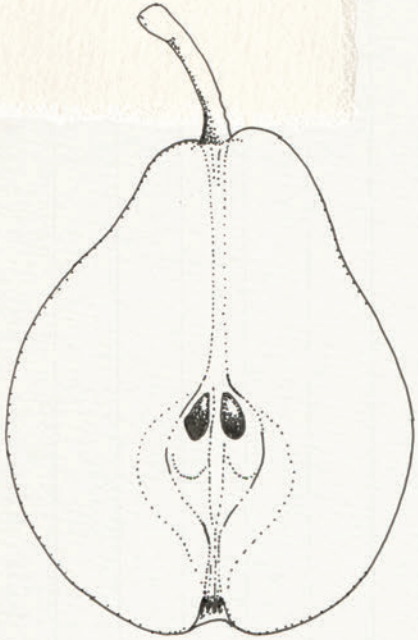
Consistent pruning makes for easy pruning. If you keep pruning, by about the second season you should get the hang of it. You should develop a sense of the vigor of the winter prune response versus the summer prune response. You should be able to see how a heading cut creates shrubby growth and how thinning opens up the form and creates space. By year two or three, you may wonder whatever made it seem so complicated.

Depending on what you planted, you should be rewarded for your efforts with a few fruits by year three, and sometimes sooner. At Berkeley Horticultural Nursery, our little Fuji apple performed this way: first year, no fruit; second year, again, no fruit; third year, four apples; fourth year, forty; and about a hundred apples each year ever since.

CHAPTER 8

HOW MUCH WATER DOES A FRUIT TREE NEED?

"Ask the way
to the spring."
— **RUMI**



BACKYARD FRUIT TREES CARED FOR AND KEPT HEALTHY with adequate water, sunshine, pruning, and mulch are generally well positioned to resist pests, disease, and other complications that arise. Fruit trees are plants first and fruit producers second. From a blade of grass to an oak tree, plants operate on similar principles. Important for fruit trees, the information in this chapter and the next can also be broadly applied.

Established pomegranate trees like this one aren't likely to need supplemental water, but newly planted trees surely will.

When I worked in nurseries and talked to customers about their various plant problems, water irregularities caused more trouble and had more ramifications than any other issue. The water needs of fruit trees and other plants depend on constant factors like soil type, and changeable factors, like day-to-day weather patterns. Watering is never a one-size-fits-all proposition.

Water requirements depend, first, on the frequency of natural rainfall. If it rains consistently from spring through fall where you live, watering won't be much of an issue, except in unusual circumstances. When I moved to Upstate New York, I was astonished to learn that nobody needed hoses, except when they wanted to wash the car. Watering was simple: wait for rain. In places like Portland, Oregon, or Portland, Maine, plants get along just fine without supplemental water most of the time.

In California, however, the rain usually stops in April and doesn't resume until October or November. This is one of the factors that defines a Mediterranean climate. Most plants here fare poorly without some irrigation. For reasons unclear, plants handle natural rainfall pretty well in places like the Portlands — far more easily than they manage a conscientious gardener in a Mediterranean climate with a garden hose or a timed sprinkler system.

SIGNS OF DROUGHT STRESS

Plants contend with drought situations in a number of ways. Plants that naturally tolerate drought have small leaves or waxy, gray, and fuzzy foliage that both deflect the effects of too much sun and help a plant conserve available water. A pomegranate, for example, tolerates more drought than a persimmon. You can tell by looking. Big, deep root systems have the capacity to collect more water if water is in limited supply. The five-inch oaks that sprout in my meadow have eighteen-inch taproots. Plants without these overt defenses, though, can still handle some drought in the same way that people manage the stress of a few sleepless nights, provided it doesn't become chronic.

Losing Luster

As a plant tries to manage a water shortage, certain routine events tend to occur. Plants that run dry lose their healthy luster. A practiced eye will catch the flat, blue-green color of a suffering lawn by sight, as well as the same dull green of dry plants in the nursery, garden, or forest. Spring growth that follows winter rain or snowfall shows itself in bright, shiny foliage. As the summer progresses in my unirrigated summer-dry landscape, the vibrancy of foliage flattens and grows drab until spring comes again. The native and Mediterranean plants in my garden have adapted to tolerate just these conditions.

Wilting

Wilting is a plant's first line of defense against a water shortfall. Wilting has a biological function. When leaf surfaces droop they get less sun, and with less sun the plant preserves its diminishing stores of available water. Plants running slightly dry are also more likely to sunburn. Sunburn looks like sunburn — scorched — and, like sunburn on a

What's Your Soil Type?

One factor that affects water is soil. The ratio of clay, sand, and silt particles defines soil type. Water penetration improves with more sand particles to separate the silt and clay particles. Does this mean you should add sand to your clay soil? Emphatically not, but more on this shortly.

Clay

Clay particles are the tiniest soil particles. They stick together. More accurately, they congeal. If you dig clay soil, it hangs together in a big lump. Water and air won't move easily through soil that is predominantly clay because the spaces between soil particles are so small. Clay soil is mucky and airless when it's wet and impenetrable when it's dry. When you water clay soil, the water slicks out across the surface of the soil in a shallow puddle. Water that confronts heavy soil has a hard time going deep. Roots growing in heavy soil appropriately stay near the surface to get the water and air they need. To compensate for heavy soil, water long and slow. This gives the water a chance to percolate down. Water less frequently – heavy soil excels at holding water. Clay soil is rich in minerals and nutrients because they don't wash away.

Sand

If sand is added to clay soil in the interest of drainage and in inappropriate amounts, the tiny clay particles gather around the sand, much the way cement gathers around sand particles to form concrete. As discussed in chapter 5, organic amendment dug into soil can be counterproductive. Removing "bad" soil and replacing it with "better" soil changes the way water moves through soil and will likely make your problem worse. Develop the soil you have with mulching. As you will learn in the next section, surface mulching is the best way to amend any kind of soil and improve its capacity for managing water.

In contrast, sandy soil lacks enough clay and silt to hold water around roots. The air pockets created by too much sand send water racing down and away from the root zone. Plants that grow in sandy soil need more frequent watering for shorter durations. Plants not naturally acclimated to sandy soils need more fertilizer, too. Roots grow easily through fast-draining soil – they meet no resistance – but this soil type dries out quickly and nutrients leech away with frequent watering.

Loam

Gardeners aspire to loam. Loamy soil has a balance of clay, silt, sand, and organic matter that combines the drainage benefits of sand and the water and nutrient holding capacities of clay. In places where loam doesn't naturally occur, a top dressing of organic mulch will reduce water needs, create healthier soil, and encourage marginal soil of any kind in a loamier direction.

person, manifests in a pattern on the parts of the plant that had too much exposure. At the nursery, we always saw lots of sunburned leaf samples a couple of weeks after a heat wave, yet our customers rarely connected a sunburn event to the weather.

Drought stress shows itself from the outside in. With extreme water shortages, water travels through the plant as far as it can go. When a plant runs out of water the tips and edges of foliage dry out and turn brown. If the lack of water recurs consistently — if, for example, a sprinkler system is timed to run consistently a little short — a series of lines appears at the edge of the leaf, one line for every time the water didn't go quite far enough.

WATER IN EXCESS

Proper watering allows for an exchange of water and air in the soil. As roots pull water out of the soil, air comes in. Roots need air as much as they need water. Plants affected by over-watering lose roots, not because they have too much water, but because they lack oxygen. Roots without oxygen die off. As the root system in waterlogged soil gets smaller, it tries to maintain a plant that is too big in relation to the diminishing roots. Damage from root rot progresses exponentially. Continue to water as you have been, and the problem quickly grows worse and worse.

An over-watered plant preserves the exterior of the plant at the expense of the interior. In essence, it gives itself less plant to support by losing foliage. A plant sheds yellow leaves from the inside out, yellow foliage that drops or detaches easily when you tug at it. The center and lower parts of the plant are affected first. In contrast, yellow leaves that hold fast to the plant indicate micronutrient or nitrogen deficiencies, not excess water.

Plants with water-damaged root systems have more difficulty recovering than plants that merely dry out. If you catch an underwatered plant in time, the roots hydrate and begin to grow again. In contrast, the small and shrinking root system of a water-damaged plant lacks the capacity of a healthy plant to pull much water from overly soggy soil. The plant can't do its part to help the soil dry out. Soggy soil stays wetter longer, a big problem for the already waterlogged roots. When the soil does begin to dry out, you must water these plants as soon as they need it and only as they need it to allow the root system to grow large again. Even with a moisture meter, recovery is tricky.

In addition, too-frequent watering keeps surface soil consistently moist. This moist surface favors an environment for many soilborne diseases, especially a problem for

apricots and cherries. Water plants long enough to give them a good soak. The size of the resulting root system enables a plant to survive as the surface soil dries out. Dry surface soil greatly reduces the likelihood of disease. Let soil dry at least a couple of inches down before you water again.

Check for moist soil first if a plant is wilted. Plants that wilt when soil is moist don't need water. When a plant perks up after a hot day at sundown, this means it protected itself from the sun by drooping its leaves, a natural process called transpiration. If the soil is moist, don't add water. If you water a wilted plant and it perks up, you don't have a problem. If you water a plant and it stays wilty for several days, you likely have a collapsing root system — damage that might be corrected with careful watering, but is more likely irreversible.

JUST ENOUGH

When you do water, water thoroughly. Let plants use up most of the water they're given, and then water thoroughly again. How often is this? It depends on the situation. Light soils require more frequent water. Heavier soils require less. For established fruit trees in lighter soil usually once weekly is enough; in heavier soils, and as the tree gets older, water once or twice a month or only rarely. If you find yourself watering daily, you're probably not watering deep enough. Again, proper watering depends on a number of factors — the soil itself, the presence or absence of mulch, the weather, the wind, the time of year, the age of the plant, and the type of rootstock.

While a moisture meter won't ever replace alert human engagement and observation, this device costs very little and can be helpful as a tool of enlightenment. Water, check the moisture content of the soil around the plant in several places and at different depths with the meter, then check the moisture content before you intend to water again. As you work with the meter, a pattern develops. Things underground might not be as you supposed. Use the plant's water usage pattern as shown by meter readings to adjust your watering schedule. Let a plant set its own watering pace. A moisture meter can be especially helpful if you're working out timing for a drip system.

The need to water provides an excuse to get into the garden. It keeps you engaged and aware of events there.

With or without a drip system, most people water too often and not thoroughly enough. A problem with boring insects in young trees suggests the drought stress associated with this kind of watering. Plant roots follow water in the soil. Thorough, less frequent watering results in a plant with a root system big enough to sustain itself in crisis situations — hot days, droughts, and two-week vacations. An extensive root system makes a more resilient plant.

Be aware of a few other considerations. Plants work harder and use more water on hot days. They also work harder and use more water when they are actively growing in the spring. Wind can be more drying than heat. Depending on the soil and type of rootstock, most trees more than four years old manage easily on one deep watering a month through the summer season. Because of their smaller root systems, young plants need more frequent water than established plants, but less than you might think if you water thoroughly enough. Check with a moisture meter if you are uncertain. Nights are longer and cooler in late summer and autumn, even when it's hot in the daytime. As a plant slows down and readies for winter, it uses and needs less water than it did in spring and early summer. Last but not least, less irrigation makes fruit meatier and concentrates its flavor.

Ultimately, nothing beats a little attention. Water systems on timers encourage inflexibility and detachment that are usually not beneficial to plants. The need to water provides an excuse to get into the garden. It keeps you engaged and aware of events there. Hose-end bubblers, sprinklers, and soaker hoses hooked up to spigots you turn on and off yourself deliver water slow, deep, and as needed.

CHAPTER 9

WORKING with MOTHER NATURE

"A good farmer is nothing more nor less than a handyman with a sense of humus."

— E. B. WHITE

HEALTHY PLANTS ARE LIKE HEALTHY PEOPLE. They have strong natural mechanisms at work to ward off potential trouble. They self-correct. Gardeners can support these systems in numerous ways: by paying attention, by deferring to climate when making plant choices and choosing varieties, and by meeting a plant's fundamental requirements for placement and care.

Plant diversity is one feature of a healthy garden. An elaborate dance is at work here, with a beauty, order, and intelligence of its own.

Some troubles arrive with the weather. Certain plants have built in susceptibilities to certain pests and diseases. As with people, the natural decline of aging weakens defenses and aggravates all kinds of issues, whether a plant's life span is as short as a summer season, like a tomato, or centuries long, like a redwood.

Engagement with the garden as plants cycle through their seasonal changes — "the footsteps of the farmer" — is the best defense against problems of all kinds. An attentive gardener can remedy problems in their early stages and, more important, has fewer problems to begin with.

Insects and diseases are opportunists. They take advantage of plants compromised by either human-induced or natural phenomena. Plants can be stressed by being situated in the wrong place or being improperly cared for — given too much attention, for example, or not enough — or by acts of God: torrents of rain, drought, heat, and the unseasonable late frost.

Engagement with the garden is the best defense against problems of all kinds. An attentive gardener can remedy problems in their early stages and, more important, has fewer problems to begin with.

Borers attack elderly fruit trees, drought-stressed trees, and sun-stressed bark. Killing borers does nothing to resolve the underlying problem. Aphids enjoy succulent new growth from too much fertilizer or an especially rainy spring. Aphids also attack plants like pansies and Swiss chard at the end of the season as the plants go into a natural decline. Cherries, apricots, and plums are disposed to weeping sap, called gummosis, but water-logged soil promotes it with a vengeance. Mildew prefers certain varieties to others and is most active when these plants get too much shade, or during cool, dry conditions. Fire blight is a bacterial disease that enters through blossoms and causes stems to wither. It attacks apple relations and is promoted by extreme temperature fluctuations from day to night.

LIVING WITH PESTS AND DISEASES

Gardens don't need to be pest free. Having a balance of insects in the garden is okay and even desirable. A garden that maintains some prey attracts beneficial predators. Small outbreaks of ash whitefly on citrus, for instance, encourage their Encarsia wasp predator to stick around. As long as both survive in the landscape, the small populations of whitefly that spring up from time to time are naturally controlled. It's an elegant system.

In many instances, minor incidents of disease do little harm. Disease problems often decline as the weather becomes more congenial and soil conditions are rectified. It's easy enough to prune out diseased and infested foliage and remove infected fruit as you come across it, especially if your trees are small. And pesticides, even the least toxic, can harm beneficial insects in the garden.

When encountering trouble, don't panic. Most plants can sustain some damage. Proceed as you do with pruning: evaluate the situation before taking action. Run through a checklist. Is the problem stable or getting worse? Is the plant compromised by an environmental condition like weather, drought, or too much shade? Is that condition temporary or permanent? Is it something you can fix, like your watering practices, or is the problem caused by a larger issue that is out of your hands, like irregular weather patterns?

When you address root causes, so to speak, the secondary problem often resolves itself. If you can't fix it, say, by pruning up trees to bring sun into a shady area, or because the plant is too big to move to a more favorable location, the problem is sure to continue. Personally, I find these constant battles wearying. The very best lesson I learned in all my years of nursery work is this: eject the troublesome, and install plants that want to live where you want to put them.

You can probably relax if only a small percentage of the fruit or foliage is affected, the tree is otherwise healthy, and the problem, whatever it is, doesn't seem to be getting worse. When do you call in the big guns? I rarely do. A spray bottle of anything offers support but only solves part of the problem.

Some garden events fall under your control and some don't. Cursing the weather is a pointless exercise. As I write this, it rains unceasingly on my blooming Friar plum. It's cold out there. Not a bee in sight. It goes that way sometimes. That's farming, and one reason I'm a gardener, not a farmer. Other things being equal, the most appropriate action is often acceptance. Let Nature take her course. Next year provides a new set of headaches, and a new set of rewards.

Regarding Insects

Aphids. Aphids are small sucking insects that come in a rainbow of colors. On fruit trees, they are most commonly green and black. Aphids gather in what seems like an alarming abundance, usually in spring, and feed on newly emerging foliage. This foliage grows out to be twisted and deformed and is commonly confused with peach leaf curl. Aphids secrete a sticky substance called honeydew that attracts ants. Ants corral and farm the aphids like milk cows and fight off aphid predators. Aphids especially enjoy the succulent spring foliage of plum trees but are a common problem on other fruit trees, too. They prefer lush growth, the kind promoted by abundant spring rains or the use of certain types of nonorganic, fast-acting fertilizers.

Many predators go after aphids. If you unfold a curled aphidy leaf, you usually see these insects at work. Tiny, gray, puffed spheres are aphid carcasses that hosted the egg of a predator wasp. Little red and black "alligators" are baby ladybugs and big aphid eaters compared to the charming and more familiar adults.

Don't bother with packages of ladybugs. Sellers collect and remove hibernating ladybugs from native habitats. When you release ladybugs in the garden, they're in a migratory mode and fly away. Let predators come in on their own. If you have a sizable population of aphids, they will. Washing aphids off with water is as effective as any kind of organic or chemical spray, but definitely optional. Aphids are active only two to three weeks before they move on. The deformed foliage they leave behind looks worse than it actually is.

Wooly apple aphids. Wooly apple aphids are a different story. These cottony white aphids attack apple trees and apple relations like pears and quince. These aphids stay put. Spraying with horticultural oil kills surface insects — not a bad idea — but wooly apple aphids make galls in both roots and stems and live inside plant tissue where you can't get at them. If practical, cut out smaller infested stems when you spot them. A mulch of worm castings improves the overall health of the tree and may encourage the

These wooly apple aphids form galls in plant tissue.

insects to go elsewhere. Systemic pesticides that travel through a plant's system to control pests are dangerous for people and compromise the health of plants. Nor are they particularly effective. Never use systemic pesticides on food plants — the poison travels through the plants and into the fruit. A plant with wooly apple aphids can live a long, long time if you keep it healthy otherwise.

Scale. The symbiotic relationship between barnacle-like scale insects and their ant protectors can be intractable. This requires additional attention like manual removal, targeted organic pest controls, and applications of worm castings. But even for scale insects, resolving the stressors that invited these scaled insects in the first place makes the most difference.

The Elaborate Dance

Leafcutter bees saw perfect circles from foliage to use as nest packing and are important pollinators. The plant doesn't suffer. Spiders, even black widows, do no real harm and a considerable amount of good. Whitefly and housefly populations explode when people routinely spray around the exterior of the house to kill spiders. When we offered this no-spray advice at Scenic Nursery the pest control companies cried foul but couldn't manage either fly population with pesticides once the spiders were dead. Live and let live. Chemical controls provide short-term solutions before insects develop resistances, but in the final analysis leave us worse off pestwise, degrade the environment, and affect our health.

When we lend an active intellect to the garden, it responds in kind.

An elaborate dance is at work with a beauty, order, and intelligence of its own, of which our understanding is limited. We, too, contribute to the cosmic scheme of things, as much a part of that order and intelligence as a bird or an apple tree. When we lend an active intellect to the garden, it responds in kind.

Use pesticides — especially the organics — when you need to, but never regard a pesticide as the entire answer. The best approach is to watch the whole of what goes on in the garden, support the impulse toward health and life, adopt a philosophical attitude, and allow events to unfold. It helps to develop more tolerance for imperfection and an occasionally reduced harvest. We can cut the apple around the odd codling moth. Good plant health and an environment in ecological balance is the first and best defense against insects and disease.

MULCH & FERTILIZER: LOAM WASN'T BUILT IN A DAY

In many natural environments, a layer of nutrient-rich duff of decaying leaves and debris builds up on the surface of the soil. This layer benefits plants for numerous reasons. Microbial activity as leaves decay aerates and enriches the soil. Microbes also boost overall plant health because of their probiotic relationship with roots. In addition, decayed plant material reintroduces nitrogen and provides other nutrients to the soil. The duff layer slows the evaporation of water. It keeps roots cool and functioning efficiently. A surface mulch of organic material does the same thing.

Mulch is a classification, not a specific material. Any covering laid on the surface of the soil is called mulch. Sheet plastic, sand, and stones are sometimes used as mulch, though I don't recommend them. Bagged products from the nursery, organic matter like leaf rakings, and chipped-up trees make great mulch.

Organic mulch has every desirable consequence. Surface mulches reduce the need for too-frequent watering. A mulch at least two inches thick slows the evaporation of water from the soil and helps any type of garden soil stay more evenly moist. As a top dressing of organic matter breaks down, it improves tilth and the overall health of the soil. It improves the friability, or looseness, of clay or compacted soil. And mulch just looks nice.

In any type of soil, mulch breakdown helps a plant gain access to soil micronutrients, such as iron, that it might have a hard time getting otherwise. If plants like citrus show nutrient deficiencies, mulch should be a part of the remedy. Mulch keeps roots warmer in winter and cooler in summer. Mulch attracts earthworms to the loamy soil developing beneath. It prevents weeds from competing with root systems.

My Mulching Method

Every fall, I like to apply a thick top-dressing of a soil amendment that contains fifteen to forty percent chicken manure around my fruit trees, a combination that provides both mulch and fertilizer, the only fertilizer my fruit trees get. At a depth of at least two inches and spread to the perimeter of the tree canopy – called the *dripline* – this application carries a fruit tree to the following fall. The mulch advisors say keep mulch away from the trunk. This is probably a good idea. Try. I've never been able to do it. As soon as I water, the mulch is back where it shouldn't be. I never found this made much difference, maybe because the mulch I use dries out so quickly.

Lazy Way Compost

Compost makes itself. Any household with a little outdoor space can take advantage of a compost bin. My square stacking bin has a lid that keeps the mammals out. More people should avail themselves of this nutrient-rich, free, easy, wormy, benign, something-out-of-nothing resource that benefits almost everything in the garden. Homemade compost is a far better product than anything a nursery sells in a bag. Plants love this stuff.

To make compost, pile moist or green materials like kitchen scraps and fresh garden prunings into the bin with dry materials like fallen leaves, shredded paper, or crumpled newspaper in roughly equal proportions. Keep wet and dry materials piled alternately and airily. The finer the material, the more quickly it degrades. If the pile gets too goopy or begins to smell, aerate it with dry material. If it gets too dry in summer and stops cooking, add a bucket of water. Cool weather slows the whole process down. That's all there is to it.

I keep a small bucket under the kitchen sink, lined with a folded piece of newspaper. Into it I deposit a daily supply of compostables – kitchen scraps and paper, everything from toilet paper roll tubes, coffee grounds, empty seed packets, worn-out cotton T-shirts, egg shells, grapefruit rinds, and onion husks – before dumping it in the compost bin outside. Nonwoody outdoor debris, such as perennial prunings and leaf rakings, go into the outside bin, too. While there is minor controversy about the efficacy of using paper in compost, most agree this practice is safe.

To make compost, pile green materials like kitchen scraps into the bin with dry materials like fallen leaves in roughly equal proportions.

Green waste from a single household makes a sizable contribution to the waste stream. Every solitary compost pile goes a long way to help control the aggregate costs, both fiscal and environmental, of collecting and driving our green waste to the local composter/garbage dump. As good as we might feel about civic recycling, better – it seems to me – to keep as much of our waste as close to home as possible. Better still to use the alchemy of microbes and time to degrade our refuse and spread it enrichingly throughout the garden.

Compost takes care of itself until the bin will hold no more. Then, devote a day to a big compost harvest. Set the undecayed material from the top aside on the lawn and shovel out the compost from the bottom of the bin. The last time I did this, I collected ten cubic feet of fluffy, earth-fragranced material that I deposited directly into my raised vegetable beds. The broccoli sure liked that. Compost is great for fruit trees, too. There is never enough compost. Dole it out to your highest plant priority.

Say No to Synthetics

Landscape fabric and sheet plastic, even products with perforations, used under layers of mulch are counterproductive. These products interfere with the water and air absorption roots need to be healthy. A barrier of landscape cloth also keeps the beneficial effects of mulch as it breaks down from improving the soil. And it adds more useless plastic to our already plastic-saturated world.

Landscape fabrics don't even control weeds very well. As chipped bark, leaves, and garden debris accumulate on top of these weed barriers and decompose, weeds grow in the layer of organic matter that develops there. If mulch laid directly on soil is at least two inches thick, the few weeds that grow through are easy to remove.

Do You Need to Fertilize?

Once established, fruit trees usually get the nutrients they need from the soil. Fertilizer is optional for most established fruit trees with the possible exception of persimmon and citrus. Mulch alone often rectifies nutrient deficiencies, and mulch can be fortified with manures or used in conjunction with fertilizer. Organic sources for nitrogen like organic fertilizers, manures, blood meal, and fishmeal release more slowly and last longer, and they preserve earthworm populations.

Plants pick up nutrients from fall fertilizer applications while the soil is still warm. These nutrients provide a kind of savings account for the tree and become available when growth begins again in spring. Spring fertilization is less effective because plants can't take up nitrogen when the ground is cold.

Mulch benefits fruit trees. Use it.

Be aware that soil products at the nursery labeled "organic" are usually organic in the biological sense and not organic in the way most of us use that term; that is, certified. Soil products aren't regulated like food, but they don't necessarily contain anything harmful. Soil companies list product ingredients in order of decreasing quantity on the bag.

I evaluated my gardening dollar and realized I spent fully 80 percent on surface mulches compared to the 20 percent on plants and everything else. That actually works out about right. Buy as much top dressing as you can afford, or find out if a local tree pruner will deliver chips for free. Some do.

Only Dr. Gordon Frankie of the Urban Bee Project at University of California, Berkeley, lacks everybody else's enthusiasm for mulch. Mulch makes life difficult for ground-nesting bees. Bees are vital pollinators on our garden planet. Bees are endangered.

Our lives would be grim without them. Do these bees a favor. Target your mulch where it's most useful and leave at least half of your ground bare to accommodate the bees.

IN PRAISE OF WORM CASTINGS

This section leaves the solid ground of hard science to enter the realm of anecdote and personal experience, but the news is too good to omit. When a plant is stressed and bug-ridden, once the environmental causes of that stress have been identified and corrected, I often recommend a top dressing of worm castings. Worm castings are like acupuncture or homeopathy for the plant kingdom — they work in ways that are subtle, mysterious, and unlikely. Plant pathologists remain leery and, in fact, might laugh you out of town. In my experience worm castings are hugely helpful, especially with soil diseases and all sorts of insect infestations.

I recommended worm castings to hundreds of customers, saying just what I say here. It sounds crazy. Try it. Report back. They did. Worm castings worked for them, too. Not always. Castings may differ batch to batch depending on how old they are and what the wigglers eat. Worm castings help only if other environmental factors, like water issues, are resolved. Even so, they seem to provide benefit enough of the time to assure me that my experience has valuable general applications.

Worm castings are essentially worm manure. Red wigglers digest food scraps and junk mail into a dense and odorless compost that plants adore. You can easily make worm castings at home in a worm bin. If you're not up to tending livestock, you can buy a bag of worm-free worm castings at most retail nurseries.

Worm castings are like acupuncture or homeopathy for the plant kingdom — they work in ways that are subtle, mysterious, and unlikely.

Worm castings are rich in nitrogen, growth hormones, beneficial microbes, micronutrients, and minerals. The who-knows-what that makes plants resistant to insect pests and disease is more concentrated in worm castings than in wormy compost. Because worm castings are more expensive, I use compost more generally and reserve worm castings for use as preventive medicine or when there's a specific problem. You don't need much. Top-dress a plant a half-inch deep out to the dripline. Reapply every six months or as needed.

Most remarkable is the castings' proven ability to control soilborne fungus disease and its ability, as yet unproven, to help control insect infestations. Worm castings seem to accomplish this systemically — from the inside out.

Maybe worm castings boost the overall health of soil, which has a positive effect on plant immune systems much the way a substance like brewer's yeast boosts immune systems in people. Vermiculturalists speculate that the chitinase enzyme in earthworm castings degrades chitin. Because insects, like ants, have exoskeletons made of chitin, they avoid a top-dressed layer of castings around a plant and seem to stay away from the plant as well. This sounds plausible. It may or may not be true. Maybe worm castings complete some missing link in the environment that makes everything work better. The reasoning is unclear and in dispute, but there are several ways this might work.

Ants have a reciprocal relationship with aphids and scale insects. Ants fight off predators in exchange for the sweet and sticky honeydew these insects produce. If worm castings keep ants away, the absence of ants might give natural predators already present in the environment the opportunity to go after scale insects. Or possibly, the next generation of scale insects present when castings are applied may prove to be weaker than the parent generation, and more likely to die off. Treated plants might also be less attractive to invaders because, overall, they are healthier and have better defenses than weakened plants do.

Case 1: Take Scale on a Grapefruit Tree, Please

The ten-foot grapefruit tree that grows in my parents' yard was riddled with cottony cushion scale insects, white and puffy insects especially fond of citrus. Insecticidal soap killed them, but new scale came right back. Oil sprays kill scale insects only in their soft-bodied crawler stage. Once the insects develop protective cover, they're safe. Ants ran up and down the trunk. Black sooty mold grew on the honeydew secreted by the scale and covered foliage and fruit. From a practical standpoint, the tree was too big to keep spraying. Nothing conventional did the job, but I had long heard rumors about worm castings from a variety of sources.

I put a half-inch layer of worm castings under the tree. I layered two inches of bagged mulch with 40 percent chicken manure on top of that. In six weeks, the scale had all but disappeared. New foliage popped out, bright green with a healthy shine. Now, I top off the mulch once a year with chicken-rich soil amendment and top-dress the plant with worm castings every six months or so. The tree radiates health. It looks better than ever — robust, healthy, lush, and green. Are the castings responsible? I couldn't tell you, but I won't leave them out of the mix.

Case 2: Codling Moth in the Fuji Apples

The caterpillars that tunnel through apples are the larvae of codling moths. Codling moth control requires a multifaceted approach. Even then, prudence makes peace with the idea that you never get them all and that more moths are on the way. Codling moths fly in from other locations all summer and overwinter in fallen fruit. By far, sanitation is the most effective means of codling moth control. Dispose of fallen fruit. Don't put infested fruit in the backyard compost pile.

When the Berkeley Horticultural Nursery apple tree had reached age seven, nearly half the crop showed sign of codling moth. I thinned each clump of apples to one lone fruit so caterpillars couldn't travel fruit to fruit. I removed fruits from the tree that showed signs of infestation, the "dimple" where the hatched caterpillar drilled in. In this case, I sent a heartbreaking 40 apples from my smallish apple crop to the nursery green bin. At that point, I closed the barn door by applying a half-inch layer of worm castings. The following January I applied another. Nothing else changed.

By the next fruiting season, the tree showed no evidence of codling moth at all. In subsequent years, I repeated January and June applications of worm castings. I always removed one or two infested apples, but we never again had a problem like we had that one bad year. It's important to note that the tree is small, so I removed occasional wormy apples as I came across them, and that our tree was otherwise cared for and in good health. Except for the addition of worm castings, nothing else about our care of the tree had altered. This experience by no means represents a controlled experiment. I can't say for sure that worm castings were the magic ingredient, only that it looks that way to me.

Codling moth larvae create wormy apples. Eradication is difficult because the moths fly in all seasons.

Used as part of a wider program, traps provide some control of codling moths in isolated trees. When you read the fine print on the boxes, however, you learn that the real purpose of traps is to monitor insect populations. Barriers like paper bags or nylon stockings around individual apples are surefire, but way too much trouble for a gardener like me.

Keep things clean. Monitor and remove infested fruit and fallen fruit. Keep the tree healthy with adequate, not excessive, water and apply a layer of organic mulch. Plant diversity is an important part of pest control. Attract beneficial Trichogramma wasps by planting plants with umbel flowers like alyssum, dill, parsley, and yarrow. Unfortunately, because codling moths fly all summer, winter dormant sprays of horticultural oil offer little benefit in their control.

Colleagues and customers continually report worm casting success in the control of scale insects, aphids, wormy apples, and the mealy bugs that live not only on plants themselves but are shot through the soil of plants in containers. Even the thrips so ubiquitous in the Bay Area appear to avoid plants treated with worm castings. A top dressing of worm castings works enough of the time to make it worth trying. If they do little else, worm castings will give your plants a boost. For me, they seem to work as the most simple, noninvasive method of insect control I ever tried.

LIVING WITH THE ANIMALS

My young Sierra Beauty apple finally produced a decent crop of ten. Delighted, I monitored and admired my beautiful apples summer and into fall. One by one, birds picked off the first nine. I found them either still on the tree or scattered around the garden, not near ready, and rotting with one peck each. All the same, I like the animals. And they are only being what they are — hungry animals. By late October, when I went out to pick the last remaining apple, finally ripe, it was gone without a trace. Probably a raccoon.

My friends the Sinarles used a carbide gun, a device they called the "crow popper" in their almond orchards in Ripon, California. Every twenty minutes or so this device fired a blank and the birds scattered.

"You got used to it after a while," Debbie said.

Evidently, the crows did, too. Now and then her dad went out with an actual shotgun, killed a few crows, and hung them by their feet from the barbed-wire fence to prove he meant business. Your suburban neighbors would doubtless discourage this method of bird control.

Alternatives exist for dealing with marauding animals, just not very good ones.

Strategies and Tactics

Mylar bird scare tape, available at your local nursery, hung above and around the trees affords fruit some protection from birds. This material flashes in sunny commercial vineyards as the grapes begin to ripen. Farmers wouldn't waste time with scare tape if it didn't do some good. Hang up the tape shortly before your fruit begins to color. If birds have discovered your fruit, it's too late. The tape evidently works as a confusion device. Birds don't know if the tape is safe and tend to stay away. I attached ten-inch strips of the Mylar with packing tape around the top of a six-foot bamboo pole, like a maypole, and stuck it into the ground in the middle of the plum tree. Remove the Mylar when the crops are in. Birds learn to ignore flash tape if you leave it in place.

A barrier of net most reliably keeps birds off fruit, but net carefully. If you want to feel like a human monster, trap a bird in a bird net. Honestly, I'd rather lose the apples, but birds get all the plums, too. Small trees make netting a practical possibility. One fed-up fruit grower near Fresno grows his fruit trees inside a large mesh enclosure.

Diversion is an appropriate tactic. My neighbor Ted told me that birds wreak havoc with his grapes but leave his peaches alone. I expect the birds just like grapes better.

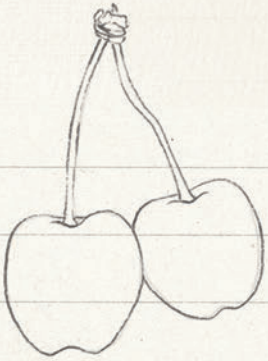
Just grow more fruit. That way, they can't possibly get everything.

This year, I carefully netted my 15 Friar plums, the total crop from a rainy spring. No problem with birds, but a raccoon worked around the clothespins and twist ties. It got away with ten of my plums without much disturbing the net. Raccoons have nearly opposable thumbs and often outsmart us. Deer eat fruit trees, even citrus. You can, of course, grow the trees over the heads of the deer, but then the trees become a different kind of headache. Plant fruit trees in a place where deer can't get at them, or put up a fence.

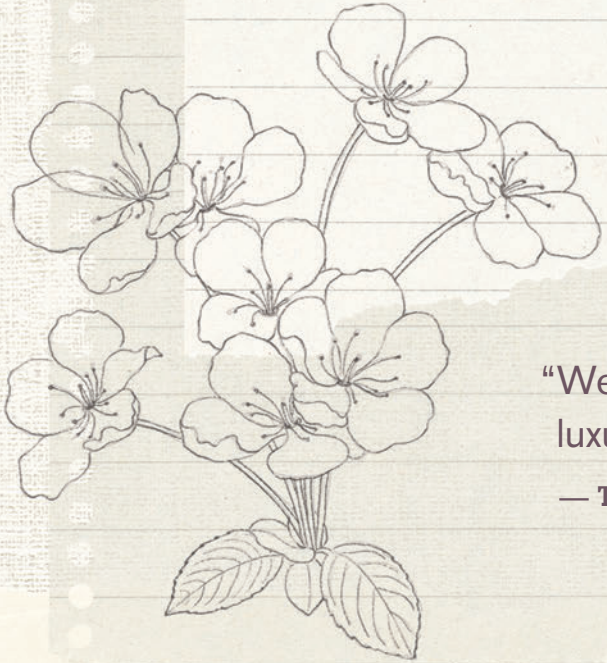
Customers report that squirrels can be distracted from ripe fruit with better snacks in a different part of the garden. Who can tell what motivates or dissuades a squirrel? Motion-activated sprinklers get good reviews. I just learned about fox and coyote decoys with furry moving tails. Perhaps these fake animals will stalk my orchard next summer. They might put off the gophers, but I doubt it.

Netting is the only surefire way to keep birds and animals from harvesting your fruit. Small fruit trees like this one make a barrier of bird net a practical possibility.

CHAPTER 10



RIPE FRUIT



"We abound in the luxury of the peach."

— **THOMAS JEFFERSON**

AND SO WE ARRIVE AT OUR DESTINATION: RIPE FRUIT. Efficiencies of scale allow a backyard orchardist to follow the day-to-day nuances of each fruit as it approaches ripeness. Sweet, ripe fruit, perhaps with a hint of acid for balance, perfectly textured, and picked at its prime is unlike fruit available any other way. The farmers' market, a farm stand, the grocery store, or a fancy mail-order house can't deliver fruit anything quite like it.

Only a home gardener has the luxury of learning the habits of individual trees; keeping them well pruned, winter and summer; thinning overproduction; keeping trees mulched and watered; nurturing them through weather calamities; coaxing them past insects and disease; and standing by them in lean years. The homegrown fruit that finally ripens has the opportunity to reach, if not flawlessness, then as close to perfection as we are likely to get. Production growers, however skilled, however conscientious, can't give attention to one tree and one fruit at a time the way a home grower can.

The less fruit you have, the more important the following information will be. As abundance becomes the rule and you have fruit to spare, as you become better acquainted and more familiar with the fruit on your fruit trees, and as years pass, you develop a knack for the look and feel of ripe fruit, and harvest becomes second nature.

A fruit tree's job is to make another fruit tree. Fruit develops around the stone or seeds to attract animals (including human animals) that carry it off to start a new life in a different territory. When fruit is ready for this journey, it loosens from the tree.

APPLES

Every September, I offered slices of tree-ripe Golden Delicious apples to nursery customers, apples picked from my sisters' Richmond tree that morning before I came to work. Many customers told me, "No, thanks, I don't like Golden Delicious," but I persisted. The shoppers turned from the four-inch perennials or the one-gallon shrubs, accepted a slice, absently bit into it, and almost without exception focused their entire attention on the experience of the fruit. They looked up at me baffled and pleased. It tasted so much better than they had expected. I can't count the number of apple trees I sold as a result of these samples, only because I had allowed the fruit to tell me it was ready.

The Fuji apples on our little nursery tree colored up seductively long before they were ripe. Wait, I told my colleagues, who couldn't help themselves and picked the apples anyway. They taste fine, one of them said, but he only cheated himself. Fine is fine, and about as good as a good apple from the store, but fine is a far cry from the flavor he could have experienced had he been willing to wait only three more weeks. Customers often complained of the blandness of apples, blaming the climate or the variety, when in fact they had merely picked the fruit too soon. In many cases, customers harvested these "bad" apples before they had a chance to develop much sweetness and the full complexity

of their flavor. Some apple varieties need even more time. Tart apples, like Ashmead's Kernel, mellow and develop their best flavor with storage.

Put your hand under the fruit and give it a gentle tug. Ripe apples release into your hand. If the fruit holds, leave it on the tree. With apples, the release is definite. With stone fruits, ripeness heightens color, aroma, and a barely soft feel, but they, too, release when they're ripe. I once heard it explained this way: the tree gives you fruit exactly when it's ready.

Because we left our fruit on the nursery Fuji so long, it often developed signs of a condition described as "watercore," translucent areas in the flesh of the fruit where sugars concentrate, usually the result of a heat spell. In commerce, these extra-sweet apples are considered inferior and, if possible, segregated out as flawed. To remedy watercore pick the apples sooner or, in other words, before they're ripe. A customer from Japan told me that watercore apples are prized there because of their extra sweetness. If you cut open a watercore apple in Japan, it's considered good luck.

APRICOTS

The best and really only way to get exemplary stone fruit is to grow your own, or talk a neighbor into doing this for you. In order to transport fragile apricots, for example, growers pick them too firm to bruise. Apricots ripen off the tree somewhat, but never as sweetly as they would have. I would go so far as to say this: unless the apricot for sale is in close proximity to the apricot tree the apricot came from, don't bother to buy it.

No fruit on any tree will ever be ripe all at once. In apricot season devote yourself to the apricots. Maximize your good fortune. Harvest and process your ripening fruit day by day, fruit by fruit. More than other crops, apricots tend to ripen together and in an exceedingly short window of time. Apricots taste best juicy, aromatic, and soft ripe. Keep an eye on color. Ripe fruit is a bright golden orange. It yields to the gentle pressure of your thumb. You learn to tell ripeness partly by the feel of the fruit. Apricots harvested at peak and left on the counter melt into a puddle in no time. Store ripe apricots in the refrigerator for up to a week.

FIGS

As fragile as apricots, and equally as perishable, succulent, juicy figs travel poorly. Figs at market, rarely as ripe as they could be, can't measure up to homegrown. Unlike apricots, figs stop ripening once they're off the tree. The flavor never gets better if you pick a fig too soon.

All figs stick up vertically from branches as they develop. A ripe fig, rich and plump with sugars, bends the stem and pulls itself down by its own luxuriant weight. Ripe figs detach easily from branches. Go through the tree, and watch for limp stems and drooping fruit. Give each fruit a gentle squeeze; it should yield slightly to pressure and detach into your hand. Figs develop a subtle intensity of color as they ripen; dark figs are rich and dark, and light figs brighten, but don't depend on color for ripeness.

Figs taste even better if they degrade a bit. Figs that begin to dry on the tree will shrivel at the stem, an indication of intensified flavor. To dry figs, let them fall naturally, and remove them to a drying rack in a place where they'll be safe from animals and insects. My friend, Margaret Davis, dried figs in the rear window of her Toyota. Most figs produce two crops. A small spring crop, called the breba crop, grows on last year's wood. When you generate new wood by vigorous winter pruning, you generate a more significant summer crop. Figs fruit mostly on new wood. No pruning means fewer figs. Prune figs whenever they look like they need it. While you may lose some breba figs with summer pruning, the resulting fruitfulness more than makes up for any loss.

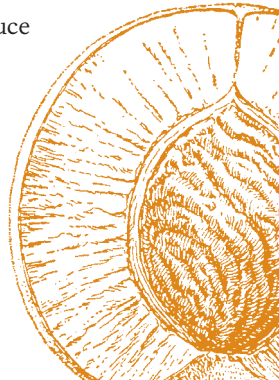
CHERRIES, PEACHES, PLUMS, AND NECTARINES

A fallen fruit or two beneath a tree in high season indicates the time has come to attend to the fruit that ripens in the canopy above. A feel for ripe stone fruit comes with experience. You want to get that fruit before it hits the ground. Cherries are relatively sturdy, or transportable, compared to other stone fruits. Time it right, and you find cherries of excellent quality at markets and along the roadside. And a good thing, too — the birds probably ate all of yours.

Cherries, plums, pluots, peaches, and nectarines develop a depth of color as they ripen. Ripe cherries and other stone fruits soften slightly when ready to eat. With cherries, test for ripeness by tasting. You'll soon know by color and feel which cherries are ready to pick. Leave too-firm stone fruits on the tree a bit longer. The flesh of ripe stone fruit has a bit of give. Richness of color helps indicate ripeness as you look at the fruit in the tree. Ripe fruit looks ripe. Ripe fruit is ready to let go.

Ripe fruit also smells ripe. Peaches and nectarines in particular are highly fragrant when they're ready. The aroma of ripe peaches and nectarines significantly impacts the experience of the flavor. Peaches and nectarines tend to ripen quickly over a couple of weeks. Compare one fruit to another while they hang on the tree. Compare riper fruit to fruit that is less mature. Some differences, like fragrance and coloring, will be obvious. Check for ripe fruit daily.

When my mother had access to peak prune plums, she halved and pitted them, then froze them in pie tins for use in future pies. These pies oozed cherry-pink sauce and were fat with plums that tasted like they were picked yesterday.



PEARS

A Bartlett pear tree was already established near the patio when my aunt and uncle, Shirley and Bob Hess, bought their house in Portland, Oregon. Aunt Shirley liked the looks of the tree's spring bloom and its bare winter branches. It provided needed shade from the western sun. A bonsai enthusiast and aesthetic pruner, Shirley trained the tree into an umbrella shape. She worked without a ladder and kept it relatively small, not allowing the tree to grow taller than the eave. The pears on this tree were consistently wormy, grainy, mushy, and inedible. She attributed this to climate or bad luck. The tree satisfied her aesthetics, so she left it in place.

What a pear does for itself and what we like to eat are separate issues. Pears don't ripen to human satisfaction when left on the tree. For best success with pears, Shirley learned to remove them from the tree when they are mature but pre-ripe, and allow them to finish their ripening inside on the counter. She ate good ripe pears from her own tree for the first time in thirty years. She also made pear chutney.

"It was excellent," she said.

Like apples, pears, too, release their fruit to the farmer.

This pear advice comes from H. P. Books's out-of-print *Western Fruit, Berries and Nuts* by Lance Walheim and Robert L. Stebbins: "To harvest pears, lift up fruit until the stem separates from the spur; do not pull or twist. If the stem does not break easily from the spur, allow fruit to ripen for a few more days."

Pears are classified as summer pears or winter pears. Summer pears ripen in early August. While a few other heirloom summer pears are still in cultivation, the summer pear you're most likely to encounter is a Bartlett. As summer pears mature, they brighten a little on the tree. Summer pears aren't stored the way winter pears are. When they begin to color and separate from the spur when lifted, bring them inside to a coolish place below 75°F to ripen for a few days. The brighter the yellow, the softer and sweeter they become. Some people prefer pears firmer, some softer and sweeter. Watch the color of the skin. Once ripe, Bartletts keep only a day or two in the refrigerator.

Winter pears begin to ripen in September. Anjou, Bosc, Comice, and other winter pears, require storage for two to six weeks of chilling at a temperature below 40°F, either in refrigeration or in a cool place like a garage or basement, before you bring them out to ripen on the sink.

Unlike apples, the shelf life of a ripe pear is quite short. Pears ripen from the inside out. By the time the outside of a pear appears ripe, the flesh inside has gone to mush. Most experts agree that the best time to eat a pear is when the flesh of the fruit gives a bit to some gentle pressure at the stem end. Eat pears as soon as they're ready.

Harvest Asian pears as you would apples.

PERSIMMONS

The most common variety of the astringent persimmon is called Hachiya, a large, handsome orange fruit; it has an acorn shape with a pointy end. Astringent persimmons contain inedible tannins that dissipate as the fruit overripens to a soft, very sweet state just short of fermentation. Eat astringent types when they're overripe. Believe me, you'll be sorry if you eat a persimmon before it's ready. A ripe astringent-type persimmon is a rich, deep orange color with maybe some black streaks.

The astringent persimmon should be soft and collapsed within its skin. This process best occurs inside on the kitchen counter, rather than outside on the tree. Let fruit on the tree color to the stem, then cut the persimmons from the tree using shears. Be gentle with cut fruit; it's prone to bruising. Get to your persimmons before the birds do. My mother — the fruit-eating expert — froze gooey-ripe halved persimmons and ate them from their skins with a spoon, partially thawed like sherbet. Like other fruit, ripe persimmons eventually release from the tree, but by that time they are too ripe to be useful except to foraging wildlife.

Fuyu persimmons are smaller than Hachiyas and have a flat, squashed shape. These and other non-astringent persimmon types have fewer tannins and develop good flavor while still firm. Fuyus are most commonly used while still crunchy, before fully ripe, eaten in hand like apples or sliced into salads. They develop a full, even richer flavor if allowed to soften in their skin like Hachiyas. For backyard gardeners, this means expanded uses, a longer season, and essentially two fruits for the price of one. Like Hachiyas, let Fuyus color all the way to the stem, then cut them from the tree. Let them ripen to either firm-ripe or soft-ripe on the counter. Firm-ripe Fuyu persimmons have a strong orange color and feel firm in your hand. Fuyus keep up to four months if stored in cool, not cold, temperatures. For best flavor, keep them out of the refrigerator.

POMEGRANATES

A pomegranate is ripe when the bright fleshy seed coverings — called arils — swell and push against exterior skin. These swollen seeds change the pomegranate's shape from a perfect sphere to something more angular and obviously under pressure from inside. Core each end and score the crests of the angles for easy peeling. The fruit will break neatly apart. The leathery skin softens slightly and develops a shine. Like other ripe fruits, pomegranates feel heavy.

Ripe arils can crack the skin apart. In the home garden, cracks that expose the interior fruit are a sure way to tell if a pomegranate is ready to eat. Use cracked fruit quickly so the fruit doesn't spoil. Uncracked pomegranates keep for a month or two when stored in a cool place or the refrigerator.

A Word about Citrus

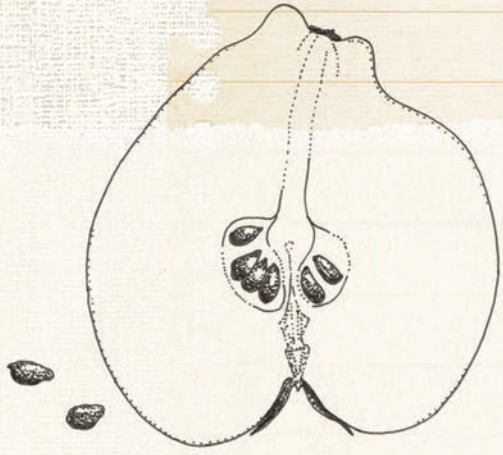
The only real way to tell if citrus is ripe is to taste it. Color isn't a reliable indicator of ripe citrus fruit. Green fruit in warm winter climates can be ripe and tasty. Some citrus, once ripe, regreens as it hangs on the tree. As a rule, though, avoid green market fruit early in the season. However, I watch for regreened grapefruit late in grapefruit season around June and July; it can be especially sweet. Ripe fruit is weightier than fruit that isn't ready; it has a nice heft. The peel of ripe citrus has a little give. Ripening times vary with locale. Improved Meyer lemons brighten in color when ripe. They set fruit and offer ripe fruit most of the year.

Citrus takes many months, often as long as a year, to ripen on the tree. Most citrus blooms and sets fruit about March and, depending on type, will be ready to use late fall and into the following spring. In Modesto, our dwarf Marsh grapefruit is twelve feet tall, up over the eave, and eight feet around – plenty big enough. It sets in April, and we leave fruit on the tree for fifteen months for maximum sweetness.

The Satsuma tangerines and Washington navels in Modesto are ready in time for Christmas stockings. Cut the fruit, with the stem attached, from the tree. Stemless fruit tends to rot once picked. Citrus also stops ripening when removed from the tree. As a rule, citrus keeps best on the tree until you intend to use it. By the time citrus fruit freely releases from the tree, it's often dry, pithy, and past its edible prime.

CHAPTER 11

ENTERING the ZONE of EQUILIBRIUM



"Eden is."

— **JOSEPH CAMPBELL**

AS YOU PLANT YOUR TREE AND TAKE UP YOUR SHEARS, remember these few important things. A fruit tree pruned to a human scale radically simplifies the entire fruit tree project. Fruit trees cycle through a seasonal process of growth, bloom, fruit, and rest, to grow again in spring. Where you time pruning, as this cycle turns, determines how the tree manages the pruning, and with what level of vigor. Be clear about the realities of fruit production. Decide what constitutes "enough."

A promising new beginning . . .

Fruit trees respond differently to heading and thinning cuts, and these differences have practical applications useful to both you, the pruner, and the tree. Winter reveals a fruit tree's architecture. Winter pruning corrects and improves that structure. Summer pruning near the solstice keeps fruit trees small. You know to promote good health and how to do it: fruit trees like sun, mulch, and deep, not too frequent water. Fruit thinning is as important as pruning.

Remind yourself that a fruit tree has a great capacity for rejuvenation and forgiveness. Fruit tree trouble is often not so very dire. When issues arise, pay attention. Consider possible causes, and correct them if you can. Watch and wait. Wait and see. Errant paths can take you somewhere interesting. You will have fruit tree disappointments, surely, but nothing that can't be rectified by waiting a few weeks, until next year, or in a worst-case scenario, by planting a new and different fruit tree — one that works better with your late frosts or spring rains or whatever limiting factors affect your environment. That $12 tree you bought at Costco on a whim and on who-knows-what rootstock might be okay in Indiana or New Mexico. It might not belong where you live.

Yes, it takes a little time for a fruit tree to bear fruit once you plant it. Should that stop you? Of course not. Time passes more quickly than we would like. Remember the woman who wrote to Dear Abby fearing she was too old for a law degree? Abby inquired how old she would be if she didn't go to law school. Three years isn't so long, especially if there is fruit at the end of the trail. You don't plant fruit trees for today, anyway. You plant them for tomorrow. My grandfather moved to a new house and planted new fruit trees when he was 96 years old. Fruit trees are about the future.

Remember what the nursery people say: the best time to plant a tree is ten years ago.

You also know this, or will as soon as you get started: pruning is easy. And satisfying. These four simple pruning rules should provide the guidance you need on the path ahead.

FOUR BASIC PRUNING RULES

Rule 1: If you don't know what to do, cut some stuff out.

This rule, from a University of California, Davis, Extension seminar on fruit tree pruning, is the best advice I ever heard for stymied and uncertain gardeners on the topic of fruit tree pruning. The implications are obvious: it's hard to make a mistake, and if you decide you have made a mistake, you can correct it later on. Better to make your best guess than to be so paralyzed by the idea of proper technique that you prune timidly or not at all. Perhaps most important, this advice reflects a trust in the native intelligence of the pruner. We are more capable than we give ourselves credit for.

First, consider the tree. Find a crowded spot with branches bumping into each other. Begin with the obvious. Use thinning cuts to remove the interfering branches to make way for the preferred ones. Remove a branch that crowds other branches. Cut out the branch growing straight up through the center. Remove crossing branches and branches that aim toward the interior of the tree. Remove a branch that shoots straight up. Remove a branch that seems redundant.

Maybe you like the direction of certain branches or their angle a little better than the others, maybe the placement is better, or maybe there is very little difference, but you have to pick something because there are entirely too many. Choose. "Cut some stuff out."

Rule 2: Prune to keep the *zone of equilibrium* within reach.

The zone of equilibrium is the fruit-producing area of the tree, located between the fast-growing upright branches that develop each season and the structural branches that become unfruitful if light is denied them by aggressive branches above. As the tree ages (and as you do), your job is to keep the zone of equilibrium at hand.

Around the time of the summer solstice, prune these upright branches by a half to two-thirds or remove them entirely. If you fail to take down vigorous branches in mid-summer, the fruit-bearing zone quickly extends beyond your ability to manage it. Prune at the solstice for size control. Your tree will likely have fruit. Unless harvest is imminent, prune anyway. Upright branches are rarely very fruitful; fruit most often develops on the horizontal branches below.

Rule 3: Make aesthetic decisions.

If a well-pruned tree is beautiful, a beautiful tree is well pruned. Prune in a way that makes the tree shapely and attractive. this rule takes a pruner's mind off the rightness or wrongness of pruning decisions in favor of something that often comes more naturally: attending to the inherent "treeness" of the tree. Prune to reveal its shape. Pay attention to a tree's natural growth habits. Subtract the distracting and disoriented. Open up the center. Prune to let sunshine in.

Prune a fruit tree as you would a rose bush: prune to outside buds, the buds that face in an outward direction away from the center of the tree. Make directional decisions by cutting above a leaf node which points in a direction pleasing to you — one that will grow to fill an empty area, for example.

Pruning is more art than science. Anyone who studies what is before her with an eye to improve its good looks will make reasonable pruning choices. One tree can bear as reliably as another, even given radically different pruning choices by individual pruners. A few well-placed aesthetic cuts in January, followed by rigorous scaling back in May or June, keep your tree invigorated, short, well-formed, and fruitful. Remember Steve Detherage's grandpa (see page 28): build the tree that's right for you.

Rule 4: Pruners learn by pruning.

Every experienced pruner knows this: pruning is the best teacher. Ed Laivo tells a wonderful story about sending his ten-year-old son out to prune a Santa Rosa plum tree in the high-density planting orchard at Dave Wilson Nursery. If a ten-year-old boy with little pruning experience could follow a four-page Backyard Orchard Culture handout with success, Ed knew he had a system that would work for almost everybody.

When Joey asked for instructions, Ed said, "You figure it out."

The boy did. He paid attention. He made decisions. Maybe he made some decisions that a more experienced pruner might not have made, decisions some might call "mistakes." But I ask you, if the tree doesn't care, what would constitute a mistake? The boy was uncertain and therefore tentative and careful, but — he had observed his father's pruning — he knew not to be too careful. Joey did fine. The tree did fine. The next year he did better. Dave Wilson Nursery hired Joey at 14. By 15 he was managing Ed's research and development programs.

Ed treasures the years he worked with his son as his right-hand man.

ONE LAST THOUGHT

Because you planted and tended your little tree, its fruit will always be more than a commodity. This Wednesday and last, I harvested the last of the grapefruit from our tree in Modesto. I share these with my sister. Nearly a month of grapefruit halves for each of us, Marsh whites, generously given from the suburb of our childhood, and from departed parents who, in addition to many tangible and intangible gifts, left grapefruit behind. We love this grapefruit. We make do with the storeboughts most of the year but wait for our homegrowns and treasure each one.

A larger value inherent in the undertaking of growing food extends far beyond edible fruit. Caring for a fruit tree has the capacity to nail you down to your own nature, to pull you into the turn of the seasons, to steal you away from the distractions that so consume us all. A fruit tree invites us to rejoin the circle of life that is built into us, who we are, and where we belong. Even if you haven't planted your fruit tree yet, you know enough to want to. That alone is a promising beginning.

A Brief Glossary

Aprium A plum-apricot cross that favors the apricot.

Bareroot The state of dormant, deciduous plants sold in winter without containers and with exposed (bare) roots.

Beneficial An insect, nematode, or bacterium that reduces the impact of plant predators or diseases.

Berm A dike or dam of raised soil around a plant that directs water to the root zone.

Bud A node on the stem that produces a leaf or blossom.

Caliper The diameter of a sapling or branch.

Canopy The leafy part of a tree.

Central leader form A method of pruning that features an upright limb as central spine.

Chill hours The average of total hours below 45°F in winter in a given environment. High numbers indicate long, cold winters. Low numbers indicate mild winters.

Chilling requirement The very approximate number of chill hours a tree needs to be dormant to perform well.

Cling A stone fruit with flesh that clings to the pit. In peaches, this trait is associated with fruit firmness that makes the fruit more desirable for canning.

Collar Fleshy tissue where a branch meets a limb that will grow to enclose a wound if the limb is removed.

Cross-pollination The transfer of pollen from one cultivar to another.

Crotch The point where scaffold branches divide. See also "scaffold."

Cultivar Another word for "variety." Santa Rosa and Catalina are cultivars of plums.

Deciduous A plant that loses its foliage and goes dormant.

Dessert apple An apple best eaten fresh.

Dormancy A period of time when a plant drops its foliage and withdraws into its woody structure and roots to protect itself from a harsh seasonal condition.

Dripline The outer edge of the tree canopy.

Drupe A fruit that grows around a pit. A stone fruit is a type of drupe.

Espalier A tree trained in a formal or informal style to grow two-dimensionally.

Fire blight A bacterial disease that enters through the blossoms of apple relations like pears in spring. Fire blight is a good descriptor. The leaves of an infected plant look blackened and singed.

Freestone A fruit that separates cleanly from its pit.

Fruiting spur A stubby twiglet that produces the blossoms that become fruit.

Genetic dwarf An ungrafted tree that naturally stays small. A genetic dwarf's size is dictated by its genes, not its rootstock.

Graft The point at which a bud, shoot, or scion is inserted into the tissue of another tree that adopts it and grows it as its own. The act of the attaching is calling "grafting." Fruit trees are cloned using grafting because a seedling fruit will be different from its parent.

Heading cut This prune removes part of a limb, which changes the buds below the pruning cut to growing tips. Bushy growth results.

Heeling in Covering bare roots with moist soil to keep them hydrated.

Keeper An apple that holds or improves its quality in storage, usually "a good keeper."

Lateral A branch that grows sideways rather than vertically.

Leader The upright central limb that leads the tree to a central leader form.

Leaf node A bud from which a leaf grows.

Microclimate A pocket of climate diversity like a sunny, protected area on the south side of a house.

Mildew A white, powdery fungus disease associated with certain plants like apples and roses and with cool dry weather.

Mulch Preferably organic material like ground bark or wood chips laid on the surface of the soil. Also used as a verb: to lay material on the surface of the soil.

Nurse limb A branch left below a scaffold prune or new graft to encourage sprouting.

Open center form A method of pruning that removes the leader to form an open, vaselike shape.

Outside bud A leaf node facing away from the center of the tree. The leaf node will have grown a leaf by the time of summer pruning.

Peacotum A peach-apricot-plum cross.

Pluot A plum and apricot cross that emphasizes the plum.

Pollenizer The cultivar that provides the pollen.

Pollinator The vector, usually a bee, which transfers pollen from tree to tree.

Pome fruit The apple branch of the fruit tree family. The fruit has a seed-containing core.

Precocity A tendency to bear fruit at a young age.

Rootstock Rootstock is a variety of fruit tree that provides the roots for a grafted scion. Rootstock grows below the graft, the scion above it. Rootstock is notable for its tolerance of certain soil and water conditions, its disease resistance, and its capacity to reduce tree size. It is not notable for its fruit.

Scaffold limbs The major supporting branches of the tree.

Scale insect A sucking insect with a hard, protective shell that attaches itself to a plant.

Scion The bud, branch, or shoot of a desired variety grafted either to rootstock or an existing fruit tree.

Self-fruitful A fruit tree that produces fruit on its own without a pollenizer.

Semidwarf A grafted tree that is somewhat dwarfed by its rootstock.

Standard A full-size tree.

Stone fruit Fruit like a cherry or peach with flesh that develops around a pit or stone.

Sucker A sprout that derives from rootstock.

Thinning cut A cut that removes a limb to its point of origin. Thinning cuts create space.

Variety Types within a classification of species. Roxbury Russets and Baldwins are varieties of apple.

Water sprout A vigorous upright shoot that grows from a scaffold, often in response to a wound or pruning cut.

Whip A young, thin tree with few branches, usually and preferably bareroot.

Winter chill See **Chill hours** above.

Zone of equilibrium The fruit-producing area of the tree.

Advantages and Disadvantages of Commonly Available Rootstocks

This list of rootstocks based on information from Dave Wilson Nursery is not intended to be comprehensive, but rather to indicate the types of issues that rootstocks can address or fail to address. When you are choosing between different rootstocks, the important questions have to do with the conditions in your backyard — climate, soil type, irrigation, and potential for pests and disease. Match the rootstock to your backyard conditions first, and then consider tree size. If a partially dwarfing rootstock matches other criteria, by all means consider it. Just remember that semidwarfing rootstock won't control size the way you might expect, and root systems that create larger trees also generate healthier and better-anchored trees. Keep trees small with pruning.

APPLES

M-7

Pro: Popular, widely adapted to well-drained soils when given adequate water, cold hardy, moderately well anchored, moderate disease resistance, dwarfs to two-thirds of standard size

Con: Susceptible to wooly apple aphid, staking sometimes required, tendency to lean, suckering

M-9

Pro: Tolerates heavy soils, precocious, productive, increases fruit size, dwarfs to less than half of standard size

Con: Shallow rooted, drought sensitive, requires staking, susceptible to fire blight and wooly apple aphid

M-26

Pro: Reasonably cold hardy, precocious, productive, dwarfs to about half of standard size

Con: Not for heavy soils, requires staking, shallow rooted, drought sensitive, susceptible to phytophthora (a root rot disease), fire blight, and wooly apple aphid

M-111

Pro: Excellent all-around rootstock, tolerates both water logging and drought, grows in poor soils and sandy soils, well anchored, good disease resistance, resists wooly apple aphid, somewhat dwarfing

Con: Susceptible to crown rot under very poor conditions

STONE FRUITS

Citation

(For apricots, nectarines, peaches, plums)
Pro: Very tolerant of wet soil and irrigated garden situations, winter hardy, induces early bearing, increases size and sugar content of fruit, somewhat dwarfing
Con: Susceptible to crown gall, bacterial canker, oak root fungus, not drought tolerant

Lovell

(For almonds, apricots, nectarines, peaches, plums, prunes)
Pro: More tolerant of wet soils than Nemaguard, productive, increases fruit size
Con: Susceptible to nematodes, crown rot, crown gall, oak root fungus, somewhat susceptible to bacterial canker

Marianna 2624

(For most almonds, apricots, peaches, plums)
Pro: Shallow root system somewhat tolerant of soggy soils, resistant to oak root fungus, slightly dwarfing
Con: Tends to lean, shallow rooted when young, suckers profusely

Myrobalan 29-C

(For most almonds, apricots, plums)
Pro: Good anchorage, adaptable to heavy soils, immune to root-knot nematode, some resistance to oak root fungus
Con: Tends to lean, mild suckering, susceptible to oak root fungus

Nemaguard

(For almonds, apricots, nectarines, plums, prunes)
Pro: Vigorous, resists root-knot nematode, excellent for well-drained soil
Con: Prefers sandy soil, susceptible to root-lesion nematode, oak root fungus

St. Julian "A"

(For plums)
Versatile plum rootstock, excellent for cold areas with fluctuating spring temperatures due to inconsistent spring weather conditions, somewhat dwarfing, preferred over Citation in north coastal mountains and Oregon

CHERRIES

Colt

Pro: Tolerates wet, heavy soils better than Mahaleb

Con: Drought sensitive, only slight dwarfing if irrigated, susceptible to crown gall, not cold hardy

Mazzard

Pro: More water tolerant than Mahaleb, especially good anchorage, most tolerant of poor and heavy soil, cold hardy, resists root-knot nematode, vigorous, moderately resistant to oak root fungus

Con: Slow to bear, large tree, root suckering

Mahaleb

(Most often used for tart cherries)

Pro: More drought tolerant than Mazzard, somewhat dwarfing

Con: Intolerant of heavy soils and high water tables — provide deep soil with good drainage, attractive to gophers, tends to sucker, susceptible to oak root fungus, some root-knot nematode susceptibility, very susceptible to phytophthora root and crown rot

A Few Good Books

Brickell, Christopher, and David Joyce. *The Royal Horticultural Society: Pruning and Training*, rev. ed. London: DK, 2011.

Flint, Mary Louise. *Pests of the Garden and Small Farm*, 2nd ed. Oakland, CA: University of California, 1998.

Ingels, Chuck A., Pamela M. Geisel, and Maxwell V. Norton, eds. *The Home Orchard: Growing Your Own Deciduous Fruit and Nut Trees*. ANR Publication 3485. Oakland, CA: University of California, 2007.

Sadly, Out-of-Print:

Stebbins, Robert L., and Lance Walheim. *Western Fruit, Berries & Nuts: How to Select, Grow and Enjoy*. Tucson, AZ: H. P. Books, 1981.

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