

# GROW THE BEST TOMATOES

REVISED AND UPDATED!

JOHN PAGE



*The mission of Storey Publishing is to serve our customers by publishing practical information that encourages personal independence in harmony with the environment.*

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# Grow the Best Tomatoes

Revised and Updated

**John Page**

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# Introduction

The tomato, *Lycopersicon esculentum*, is a fruit that we use as a vegetable. It is one of the few vegetables native to the Americas. It was first known as a food in Peru. Until a couple of centuries ago, it was grown only as an ornamental and was dubbed the “love apple.”

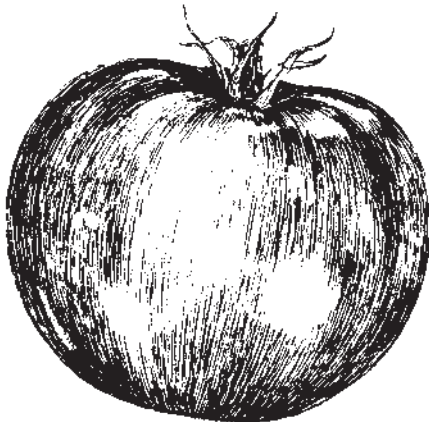
For a plant that was thought to be deadly poison in colonial times, the tomato has made up a lot of ground. It is now the most popular vegetable in our gardens. Why shouldn't it be? It can be used in so many ways, from eating single ripe ones in the garden, to frying them green, from making preserves from green and ripe ones, to pickling green and ripe ones, on into mincemeat, paste, juice, stew, soups, salads — the uses are endless.

Delete the tomato from all of your cookbooks, and you'll leave a hole that you can drive all the other vegetables through.

## The Nature of Tomatoes

The tomato is actually a perennial; if the weather never got cold and if summer or tropical conditions continued to prevail, it would keep on growing for a long time. But as it is grown in virtually every part of the United States, the tomato acts more like an annual, and is treated by gardeners as if it were annual — which means it has to make it from seed to seed in a single growing season.

We consider the tomato to be a heat-loving crop. It doesn't do well until the soil warms up to 65°F or more, and until nighttime tem-



peratures get up into the 50s. This occurs in late May in our northern areas; but if we planted seed at that time, the season wouldn't be long enough to get ripe tomatoes most years. Therefore, we have to lengthen the season by getting the plants started indoors or under protected conditions so that they are already several weeks into their growing season when soil and air reach optimal temperatures.

As we go south and reach the rough climatic equal of Chesapeake Bay, it becomes possible to start with seed in the garden and get ripe tomatoes each year. But even in these warmer areas, why not get your first tomato plants started inside, before the outdoor weather is ready? They will ripen earlier, and you can also plant seed when the time comes. Then you can have fresh tomatoes over a longer season.

The tomato isn't a particularly hard plant to grow, and to grow well, which is just as well since it is perhaps the single most popular vegetable garden plant grown in this country. Some folks are determined to make it difficult, however, and these efforts are usually centered on getting a tomato or two earlier than anybody else. This obsession with early fruit makes sense only for market growers, who can profit heavily from being the earliest. If you have gone to the trouble of getting tomatoes the size of golf balls before transplanting time, you are a hybrid between a gardener and a greenhouse grower. If it's your claim to fame, great! I figure that getting a six- or eight-week start on the weather is cheating enough and keeps me in the gardener category. I shall proceed to consider tomatoes a garden crop and not a greenhouse crop.

Tomatoes come in two different types, determinate and indeterminate. Determinate tomatoes produce fruit at the ends of their branches. They stop growing while they are fairly short. Indeterminate types, in contrast, produce fruit at intervals along their



*Determinate tomato plants (left) have flowers on the ends of their branches, and indeterminate varieties (right) flower along their stems.*



ever-growing stems. They keep growing throughout the season until frost stops them. Most gardeners will not care whether they are growing determinate or indeterminate tomatoes. Staking and pruning are the only activities that could cause trouble if you don't know which type you are working on. Seed packets, labels, and catalogs should always say which type you are buying.

## Growing Conditions

Unless you are fortunate in soil and site, some parts of the garden offer better growing conditions than others. Give tomatoes one of the good sites. The soil must be well drained with full sun. If it isn't well drained, you'd better do some drainage work. If it isn't in full sunlight, you'd better do some forestry work. Once you have selected a good site, don't plant tall peas or corn to the south of the tomatoes; these cast shadows on sun-loving tomatoes. If you have a choice, choose a south-facing slope and avoid north-facing slopes.

### Soil

We say the kind of soil necessary to grow tomatoes well isn't different from the soil conditions necessary for growing any other vegetable well, except that when we say this about tomatoes, we really mean it. They like the best of what your garden has to offer. You can chisel a little on corn and beans, but not on tomatoes. You will need to know what sort of soil you are dealing with, so start with a soil test that measures pH, nutrients, and texture if you don't already have that information.

Then put the pH up there to 6.5 or thereabouts with lime. It won't do any harm to use high-magnesium lime, as long as you don't have a magnesium test to tell you you don't need it. Your starting pH and soil condition will determine how much lime you need, but you can count on needing about 2½ pounds of limestone per 100 square feet of sandy soil, 6½ pounds for loamy soil, and 9 pounds for clay soil to raise your pH from 5.5 to 6.5.

Once it is limed, you can make a garden soil out of some pretty poor earth by tilling in rotted manure at the rate of one pound per square foot. If you have already burned out the organic matter with years of gardening, till in a dose in the fall and another in the spring.

If you don't have and can't get well-rotted manure, get a load of fresh manure, but get it a year early. In a year's time, it will be the "well-rotted manure" people are always writing about. Any kind of manure will do, but cut the amount in half if you opt for poultry manure.

If you are gardening a new piece of soil, your soil test will help you to determine levels of phosphorus and potassium as well as give you the lime requirements. The rotted manure will correct most deficiencies. So get on the manure program, which takes care of both fertility and organic matter problems.

If you really can't get manure, then you'd better go the "green manure" route, along with commercial fertilizer with frequent soil tests to keep the soil on an even keel. Soil that is manipulated to grow good tomatoes will grow good vegetables in general.

Gardeners should stop complaining about their soil being too light, too sandy, or too heavy, like clay. The solution to all of these is to keep the level of organic matter high. Manure, green manure, and compost all keep sand from behaving like sugar and clays from behaving like brick. Few of us, indeed, start with a soil that isn't too heavy or too light, and it's your job to make what you have good

## Green Manures

Green manures are simply a cover crop planted before the desired crop (in this case, tomatoes) and then cut and either dug or tilled into the soil. Beans and other legumes are examples of a good green manure: They add nitrogen to the soil they grow in, as well as adding organic matter when they are dug into the ground.

The best way to use green manures is to begin planning for your tomato garden the year before you want to plant. The first year, plant peas and beans in the garden. Harvest what you want to eat and preserve, then cut down and till the plants under. Wait a couple of weeks, then plant a cover crop like rye or buckwheat. Chop it up with a string trimmer or scythe and till it under in the fall.

If you don't want to start an entire year ahead, you can simply collect dried leaves, grass clippings, garden plants, and other garden refuse in the fall. Chop it up with a hoe or string trimmer and mix it into your garden soil where the tomatoes will go. In the spring, you will have good, rich soil to work with and your tomatoes will thrive.

enough to grow tomatoes. It really isn't that difficult. If you keep up with adding compost or manure every year — or even every spring and fall — you will end up with great soil, no matter how you started out.

If you have a real clay, carting in sand to lighten the soil is a bit like trying to desalinate the ocean beach with a garden hose. But at least it raises the elevation of the garden.

## **Starting Indoors**

We start the plants, from seed, six or seven weeks before the frost-safe date when we plan to turn them loose in the great outdoors. If you don't have the right place or the inclination to do this, simply buy started plants from your local greenhouse when it is time to set them out in the garden. The potential problem with this is that they get to choose the varieties you will plant, and their selection is usually limited compared to a good seed catalog. So we start our own plants.

### ***When to Sow the Seed***

Under the home conditions that most of us have, starting seed in early in February or even March gives us leggy, long, tangled, brittle plants that have had to tolerate poor growing conditions far too long. Little is gained in the long run by extending the six- to seven-week period between planting of seed and setting out in the garden on your "frost-safe" date.

Frost-safe dates are a myth, but along about Memorial Day in the north country you have to have a little faith — and some coats or tarps ready to cover the plants in case of unanswered prayers. If you wait much longer, you'll get only green tomatoes in the fall.

### ***The Potting Soil***

Make yourself a good potting mixture. I use 50 percent of my silt loam garden soil, 50 percent peat moss, and 10 percent compost or rotted manure for fertility. You say this doesn't add up? It has added up for me for years.

You should sterilize the soil if you are afraid of the damping-off organism wiping you out. Or go out and buy some sterilized soil already mixed, instead of using garden soil. Just don't be 100 percent sure it's sterile, okay? Otherwise, make up your own mix. If you can stand the odor in the kitchen, you can sterilize it by baking it at 180°F for 30 minutes. Frankly, I think this is a lousy way to treat living soil. I don't sterilize, but instead use vermiculite as described in the next section.

## What Ye Sow

Now get yourself a dish about the size and shape of a bread pan. The aesthetic qualities of the dish are strictly secondary to the fact that it should have good bottom drainage — good-sized holes and lots of them. Fill it with your good, loose potting soil. Then pack it down well, leaving about  $\frac{3}{4}$ -inch between the soil and the top of the container. At this stage you saturate the soil with water.

Scatter the seed evenly over the surface. If you are buying an expensive hybrid, you may have only 25 seeds in the pack. This is all right if you need only a dozen or so tomato plants. If they give you 200 seeds in the packet, and you need only a dozen, then scatter only 25 of the seeds around on the soil surface. It's a poor gardener who can't get a dozen plants from 25 seeds. Now you can cover the seeds with a sprinkling of soil if you wish, or you can let them germinate on the surface of the damp soil. In any case, here is where you can usually take care of the damping-off organism. Scatter  $\frac{1}{4}$

*Germinate seeds in  
a pan of soil mix.  
Layer vermiculite  
on top to prevent  
damping-off.*



to ½ inch of vermiculite over the surface. Then put newspaper over your dish and leave it there for five or six days. The seeds don't need light to germinate and the newspaper holds the moisture in. When the seeds start to sprout, remove the paper and let them have light. The plants are growing up through dry vermiculite. As long as it stays dry, you shouldn't have any damping-off disease problems. Keep it dry by bottom watering or watering around the edge of the dish. Plants of this size use precious little water anyhow.

## *Potting Time*

About two weeks after germination, three weeks after planting, it is time to give each little plant a pot of its own for the next few weeks. You can use peat pots, foam coffee cups, tin cans, paper cups, clay pots, or anything that suits your fancy as long as it has drain holes and won't fall apart before setting-out time. Some folks use eggshells, but I'd want turkey eggs if I were to go this route.

Before you start to pot the plants, water them well an hour or two before you disturb their roots, which you will. While they are imbibing water, fill your pots with loose potting soil and then pack the soil firmly. Punch a hole in the center with your finger. Then take a seedling — I use a fork to remove it from the soil — and place it into the hole at the same depth it was before. Pack the soil tightly around the roots. I repeat, tightly around the roots. Water the plant well at this time. Then put your ½ inch of vermiculite on the surface and go on to the next. Whenever you move a plant, break the roots as little as possible, and never let the roots dry out.

If you are growing several kinds of tomatoes, it is at this stage that you'd better get your labeling system down. You may think you can remember, but in 10 days you won't be able to tell a 'Roma' from a 'Big Boy'. And you won't find out until you have tomatoes. If your idea of fun is a mystery garden, then feel free not to label.

From here on the little plants need light, lots of light. If there isn't enough outside light, supplement it with artificial light. You can use a mix of fluorescent and incandescent light if you don't have the regular plant lights. Or just use fluorescent. One of the best systems is to hang a fluorescent light just a couple of inches above the plants. As the plants grow, raise the light to keep it at the same relative height. I'd keep the plants on 16 hours of light and 8 hours of darkness daily.

Water them only when they show a little wilt. Tomatoes are not a swamp plant. Bottom watering is still preferable. If they get long and leggy, they aren't getting enough light. They do not need hot temperatures at this stage. Old-timers always grew them in the cool windows, and around 60°F would be fine.

If they are in a full-sun window and have been exposed to several dark, cloudy days, they may show sunburn when the sun comes out suddenly. Tape a piece of newspaper up on the window for a day to acclimate them to the sun again. (Greenhouse operators use whitewash instead of newspapers.)

## Season Extenders

If you want to use season extenders to form miniature greenhouses over your plants after you have set them out in the garden, you can push the "frost-safe" date back for a couple of weeks. If you do plan to use them, then get your whole seed-to-planting operation geared a couple of weeks earlier.

We usually leave the extenders on a couple of weeks before and after the normal frost-safe date. If the weather gets particularly hot, the plants can "cook" under the hotcap, so you must be able to let in air at the base or, if very hot, take them off. You might gain a few days by covering a few of your plants. Before using these, I'd mound the soil up for a week or two to warm it up, because warm leaves and cold roots won't speed things up much.



*A miniature cold frame (above) or wall-o-water (below) will keep your plants safe from frost and help you extend your growing season.*



# Into the Garden

As the days get warmer, the soil thaws, and spring advances, it is time to think of moving your plants into the garden. Timing will depend on your location, and on the severity and duration of the winter. Tomato lovers walk a thin line. You want the last frost to have passed and the soil to be warming up toward the ideal 65°F, but if you wait too long, you will have green tomatoes at first fall frost. From year to year, your transplanting time may vary by two weeks or more.

## *Hardening Off*

Moving the plants from the indoor to the outdoor environment without damaging them is called hardening off. About a week or 10 days before transplanting them into the garden, you must begin acclimating them little by little to the cooler temperatures, to the direct sunlight, and to some wind. Let them see sun for an hour at first and work them up to 5 to 6 hours a day. If it is going to stay over 50°F, leave them out overnight. And make sure they have plenty of water. Air circulates much more outside than it does in your house, and it will dry the plants more quickly. After a week of hardening, they'll be able to take what Mother Nature has to offer when you set them out. Failure to harden off the plants can result in your having to go out and buy plants to replace all of those that didn't take the shock.

## *Setting Out the Plants*

Spacing will vary with your method of growing. If you are going to let the plants sprawl on the ground, each needs 4 by 4 feet. For those that are to be staked, caged, or trained, 3 by 3 feet is adequate.

If your soil tends to be on the wet side, set the plant out on a mound 4 to 6 inches higher than the surrounding soil. If the land is particularly dry, set the plant down in a depression, hoping that rainwater may concentrate around its roots a bit. Water plants well an hour or two before transplanting so that they will not dry out during the move.

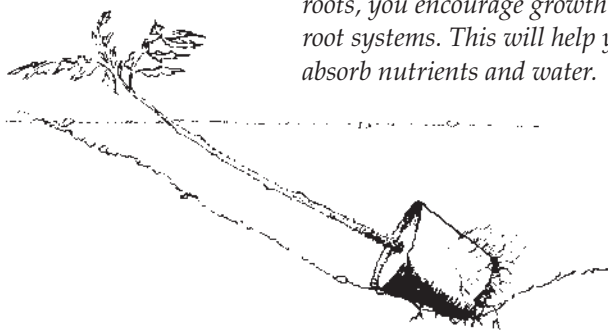
If you have nice sturdy plants, set them straight into a hole dug with your hands or a trowel. Set them about 2 inches deeper than they are in the pot. Don't disturb the roots any more than necessary. If they are in a peat pot, crush the peat pot well or cut out the bottom so that roots can escape easily. After planting, remove a couple of the lower leaves by picking them off. This brings the top into balance with the roots, which you may have injured a little in your transplanting manipulations.

If your plants are long and leggy — much stem and few leaves — lay the plant down on its side in a trench instead of in a hole. Prune off the lower leaves, leaving just the top leaves of the plant exposed, and bury part of the stem along with the roots. Roots will soon form on the stem, and at this stage the growth of the top will take care of itself in rapid fashion. We call this "layering."

Immediately after planting, water the plant well. Some folks water the plant after it is placed in the hole and again after it has been covered. This is called "mudding-in" and is common when planting woody plants. It forces all the air away from the roots. After the initial watering, go back and water only plants that show wilt. Otherwise, leave them alone. They don't need to be drowned.

If possible, set out the plants on a cloudy day. If you can't, plant in late afternoon and hope for clouds for the next day. Strong sunlight can burn the leaves of new plants, even after hardening off.

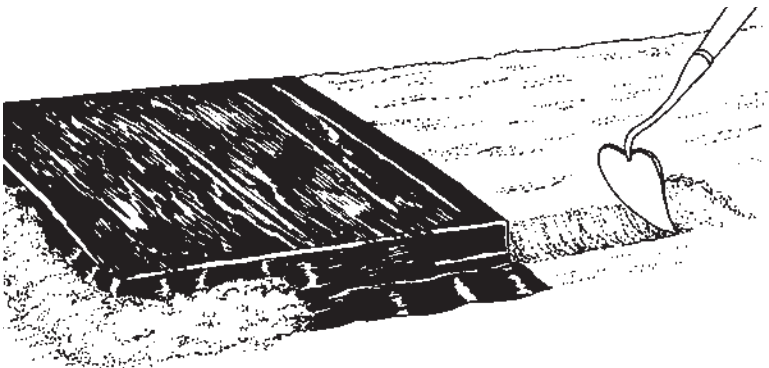
*By taking off lower leaves and laying much of the stem in the hole with the roots, you encourage growth of extensive root systems. This will help your tomatoes absorb nutrients and water.*



## Think about Mulching

Some people can't wait to bury these newly set-out little plants under a couple of feet of mulch. In fact, some folks put the mulch down and then dig a hole in it and do the planting. I'd much prefer, and strongly recommend, that you let the soil get well warmed up before insulating it with mulch. The soil should be warm enough to mulch by the time the tomato plant is as big as a basketball. Then a good hay or straw mulch 5 to 6 inches deep has several benefits. It preserves moisture and evens out the supply between rains. It keeps the tomatoes up off the ground as they develop. The mulch eventually rots to improve the soil's organic matter. And, of course, it discourages weed growth.

Black plastic mulch is okay, but it is real work to put it down and take it up. It is effective in evening out moisture supply, and it does absorb a lot of heat and speed things up to begin with. I prefer hay as a mulch for tomatoes, but I do reluctantly use plastic for melons here in the subarctic of southern Vermont. Another idea is to use biodegradable paper mulch, which will decompose in the soil.



*Black plastic mulch can be difficult to put down, but will keep away all weeds and will lengthen the growing season by absorbing heat and holding moisture and warmth in the soil.*

# Supporting Your Plants

Tomatoes do not really climb. They are rangy, spreading plants that, if left to their own devices, will spread almost as far as a squash vine will. Most people choose to restrain them and try to keep them upright. The secret is to remember that they will not attach themselves to anything, but will simply lean against any support.

I've always had a sneaking suspicion that we tie our tomatoes to stakes to satisfy us more than the tomato. If you lay down a thick layer of mulch, you can leave your tomatoes to sprawl as they choose. They will grow perfectly well and produce a good crop if you never lay your hand on them or direct them after you lay down the mulch.

## *Staking*

Because staking requires pruning, only indeterminate types of tomatoes should be staked. There are several advantages to staking. You may get a few tomatoes a few days earlier. If you are going to prune suckers, you just about have to stake them, because it is difficult to sucker a plant that is sprawling on the ground. Staking gets the plant up off the ground where it may or may not get less damage from passing insects, birds, or mice. You can grow a plant in about half the space. When you get around to harvesting, your fruit is hanging there, so you don't have to hunt for it. Staked plants look good too, as if somebody actively grew tomatoes, rather than just let them grow. There should be fewer disease problems because plants should dry out quicker due to improved air movement around them.

Conversely, staking is a lot of work: driving the good solid stakes and tying the plant to the stake, an exercise you can engage in during many spare moments. Because you do a little pruning both intentionally and unintentionally while staking, you probably get less yield per plant. Because you plant them close, you can probably get more tomatoes per yard of space. You do expose the fruit to sunburn. I have staked my last tomato patch, though I will continue to stake one or two of the small salad tomatoes to get some for early salads.

## Staking Tomatoes

Set stakes when you set out your transplant, and keep in mind that your tomato plant will get quite tall by fall. Stakes should be 6-8' tall and no thinner than 1" x 2". Drive them deeply (6-8") into the ground; your tomato plant will get heavy as it grows and bears fruit.



As your tomato plant grows, tie it to the stake using coarse twine or fabric. Knot the tie around the stake, then around the plant.



When the plant becomes as tall as its stake, pinch off the growing point at the top. Remove any new flowers that form; this will direct the plant's energy into the fruit it has already set.

## *Fence Me In*

If staking is too much work, but you still want your plants growing vertically instead of horizontally, buy some tomato cages. Unlike stakes, cages are suitable for both determinate and indeterminate types of tomatoes. Made of heavy-duty wire, they are usually narrow at the bottom and wider at the top, with strong wires

protruding 10 inches or so at the bottom. Drive the wire ends into the earth around your young plant, and it will naturally grow up through the cage. At the end of the season, you can remove the cages and stack them for storage.

If you are thrifty or a confirmed do-it-yourselfer, you can make tomato cages from concrete reinforcing wire or other wire fencing. The key here is to make sure the wire weave is open enough for you to reach your hand in and pick a huge tomato. Chicken wire will keep your plants tidy, but you will only be able to visit your tomatoes, not actually pick them. So choose an open-weave fence, and cut it into 6-foot lengths about 4 feet tall. This will give you a circular cage about 19 inches in diameter and plenty tall enough to support your tomatoes. When you cut the wire, loop the ends into hooks that will link together. Then, in the fall, you can unhook them and flatten the cages for storage.



*A cage made of large-mesh wire will keep your plants off the ground and tidy. Stake the cage to the ground for support.*

You will have to support these cages with stakes, since they cannot be driven into the ground like purchased cages. Just drive stakes into the ground on either side of your plants. Make sure the stakes are the same distance apart as the diameter of your cage. Then set the cage down over the stakes and make sure it is a snug fit. Or use one stake (place it to the north of the plant so it will not shade the tomatoes) and tie the cage to the stake. Once your plants grow into the cages, they will not go anywhere in almost any wind.

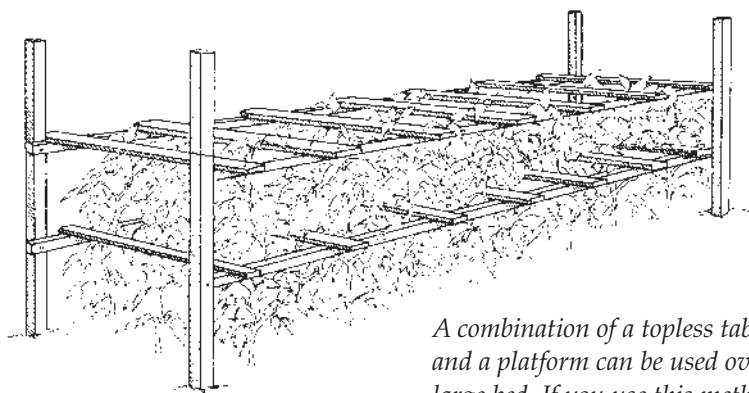
## ***Platforming***

Other ways of keeping tomatoes off the ground include letting them grow up through a snow fence or other material that is held off the ground about a foot. This keeps them off the ground, but I can do that with hay mulch, and I haven't got to worry about the platform collapsing in an early snowstorm. Besides, I think rabbits

hide under these horizontal fences and use them for raiding parties elsewhere in the garden.

## *Topless Table*

A friend of mine was as confused as I about whether to stake or cage or platform, so he devised a method that did the job well. He made a little table about 16 inches square out of some thin wood strips. The four legs were about 18 inches long. But he didn't put any top on his table. He simply shoved the four legs into the ground around his tomato plant. As it grew up through, it sort of looped itself over the edge of this topless table, and he had the best of both worlds. It sure beats tearing up old bedsheets and tying tomatoes by moonlight. When you price the cage wire, this may not sound too bad.



*A combination of a topless table and a platform can be used over a large bed. If you use this method, it becomes simple to throw a tarp over the plants in the fall if frost is predicted.*

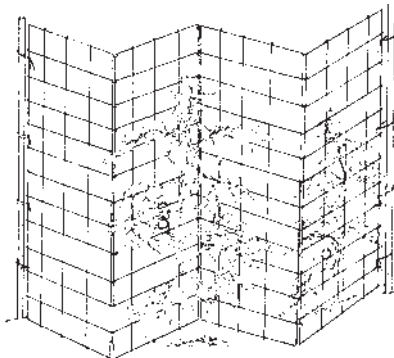
## *Trellising*

Tomatoes lend themselves to several methods of traditional and nontraditional trellising for the hopelessly tidy gardener. Several methods can be used to trellis your tomatoes.

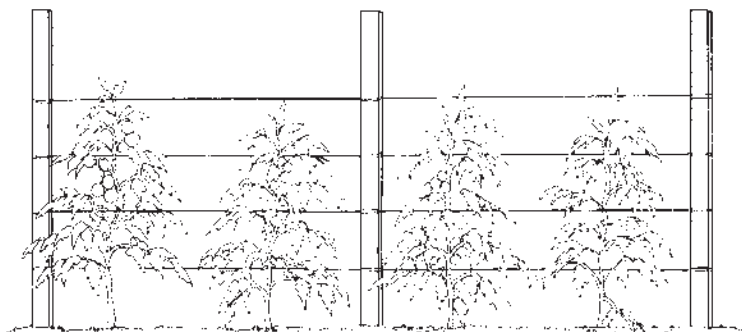
Cut open-mesh fencing into sections 2½ feet wide, leaving wire ends on one side. Loop the wire ends of one panel around the edge of the next panel. Set this fence in a zigzag pattern down a row of

tomato plants with one plant framed by two panels. The panels will support the plants, and at the end of the season, you can simply fold the fence flat for storage.

If you don't have or want to buy fencing, you can trellis your tomatoes very easily with nothing but stakes and some heavy-duty twine. Simply set tall stakes (6 to 8 feet tall) at each end of a row of tomatoes. Starting low when the plants are small, tie one end of the twine to a stake and weave back and forth between the plants. Tie at the other stake. Now do the same thing a little higher starting from the other end, making sure you are weaving back and forth opposite from the first string; every plant should have support on both sides after you are done. As the plants get bigger, repeat higher up the stakes. If your row is very long, add a center support stake, or your middle plants are at risk of keeling over, bringing down the whole trellis.



*A zigzag fence is one way to trellis your tomato plants.*



*Twine woven between stakes is an effective tomato trellis.*

## *Hangman Tomatoes*

Last, there is the hangman's method of supporting tomatoes, used by frustrated derrick operators. Here we run a tight wire above the tomatoes, then we lasso the tomato now and then and pull it up toward the wire and let it hang there until we get a new hold. A variation of sorts on this is the espalier method, where we keep the branches pinned and shaped to a fence or a wall: beautiful and effective if you have a place and the time to really put your heart and talent into it.

## **Controlling Leafy Growth**

In the fall, you often see tomato plants nearly bare of leaves, just a stalk and the ripening fruit. The theory here is that with less green to support, the plant puts its energy into the fruit. Also, fewer leaves offer less shade, an advantage in the dwindling sunlight of autumn. You can start the process while the plant is still growing, if you have the time and energy.

## *Suckering*

People ask me if I sucker my tomato plants. I tell them no. It's hard to sucker plants that grow on the ground as they get larger and denser. Many people ask this because they don't know what a sucker is and are trying to find out because somebody they know attached some degree of importance or urgency to getting rid of suckers. Suckers are simply the little vegetative growths that arise at the junctions of the stem and the side branches. They have no useful purpose, as far as I know. Prune them if you are a sucker-pruner. Pinch them if you are a sucker-pincher. Let them go and things will get pretty dense and green, often requiring some topping.

## *Topping*

Now and then, in a good growing year with frequent rains, the tomato plant will go on a wild vegetative binge in August. This requires some pretty drastic surgery. If you have a couple of plants,

you can nip off some of the fast-growing leaves with pruning shears and let the sun into the stem area. If you have a dozen or more plants, you can make a few slashing motions with a sickle or a corn knife and do the same thing. It wouldn't do any harm to do a little pruning out on the ends of the branches after you get first fruit ripe to size, anyhow. It will let in the sun to keep ripening, and put the vigor toward maturing the fruit rather than growing late-season leaves. Topping is sort of a lazy man's way of suckering.

## Care and Maintenance

To hear gardeners talk about it, tomatoes are the most difficult crop in the home garden. Not so. But you will have better results with a few pointers about what conditions they prefer and how to achieve those conditions.

### *Fertilizer*

Tomatoes like rich, fertile soil. And they are large, vigorous growers, which means they will benefit from occasional applications of fertilizer or compost during the growing season. You can apply a good organic fertilizer like fish emulsion, or well-broken-down compost every two or three weeks beginning after blossoming. Because tomatoes are sensitive to nutrient levels in the soil, they often let you know what they need. For example, a white edge around the leaves may mean they need more potassium. Thin stems and yellowing leaves may indicate a nitrogen deficiency. Too much nitrogen will cause your plants to be all stem and foliage and few fruits. And purple leaf stalks indicate a deficiency of phosphorus.

### *Side-dressing*

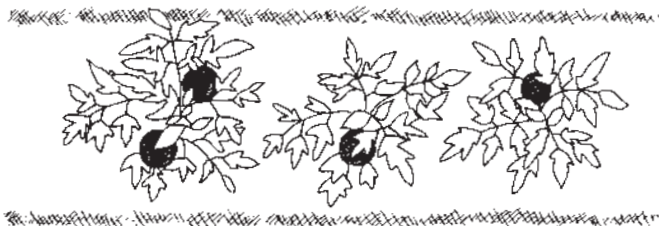
One of the best ways to get nutrients to your plants is to side-dress them. Side-dressing is a method of feeding plants without disturbing their root systems at all. Simply apply compost in a circle around each plant or in two lines on either side of your rows.

Beware of side-dressing with nitrogen until flowering is well under way. It promotes foliage growth in excess and will delay

flowering. Once flowers appear, side-dressing a little can result in more vigorous plants and more fruit, providing there isn't already enough nitrogen present. You can side-dress with an ounce or so of 5-10-10 commercial fertilizer in a ring around the base of the plant. Don't get it on the leaves; it may burn. You can use a quart of manure tea, made by mixing 1 part manure and 2 parts water, and stirring daily for a couple of weeks. Great stuff for side-dressing, but don't overdo it.



*Side-dressing in a circle (above) or double line (below)*



## **Watering**

The secret to good watering is good mulching. If you've mulched to even out the water supply between rains, don't water tomatoes until you see wilt. Then water them well and leave them alone. Frequent light watering makes shallow root growth and weak roots. What we want are roots that are reaching down and out for water. At any stage of the tomato's growth, overwatering is undesirable. Roots need a balance of both soil gases and nutrient solutions in the soil pores.

## **Weeds**

Get weeds by pulling when they are little. Mulch out weeds at the proper time. Keep herbicides away from tomatoes in the home garden. If the plant has any vigor at all, it will soon shade out any

weeds you can't reach with a hoe. If you can't control weeds in tomatoes, better take up golf.

## Problems

Your tomatoes may develop some problems. If you have purchased healthy plants or seeds, prepared the soil, and mulched properly, you are on the road to prevention. But forewarned is forearmed.

### *Diseases*

We mentioned damping-off of seedlings, which is caused by *Phytophthora*, *Pythium*, and *Rhizoctonia* fungi, and control of the disease by keeping the surface dry with vermiculite and using sterile soil. As plants get larger, damping-off organisms are no problem.

Two other soilborne diseases can wipe you out, but can also be prevented: verticillium wilt and fusarium wilt. If you get them, you have had it. The plants just wilt and die. To avoid them, buy only varieties that have resistance to these two diseases built into them genetically. Their seed packet, catalog entry, or label will have the "VF" designation.

**Blossom end rot.** By the time gardeners see the effects of this "disease," secondary organisms are present that give the tomato a rotting, moldy appearance at the blossom end. The primary cause, however, is an imbalance of calcium in the forming tomato fruit. The imbalance of calcium could be caused by lack of it in the soil due to poor liming, but more likely is caused by the inability of the calcium to be transported to the fruit because of ups and downs in rainfall at a time when the forming fruit requires a large, steady supply of water with its nutrients in solution.

The solution to blossom end rot is hay mulch, which tends to even out the moisture supply to the plant between rains. In case of prolonged dry periods at fruiting time, a heavy watering may be necessary.

**Cracking and splitting.** Ups and downs in water supply while the tomato is forming may cause cracking and splitting of the fruit. Mulching to even the water supply will prevent most of this. Over-fertilizing with nitrogen may result in more cracking and splitting than normal.

**Hard-topped tomatoes.** You may find a tomato now and then that is light colored and leathery around the stem end. This is probably due to shortage of potassium at the time the fruit needs it. Here again, evening the water supply by mulching so that the potassium supply remains constant should prevent this. Gardeners who use adequate manure should have no basic potassium shortage, but dry conditions mean the potassium stays in the soil.

**Virus diseases.** If you should get into trouble with viral diseases, you must learn to recognize them by their mottling pattern on the leaves, curly leaves, and stunting effect on the plant. Pull out infected plants as soon as you see symptoms. Don't smoke or touch tobacco when handling tomato plants at any stage in their growth, because tomatoes are very susceptible to tobacco mosaic virus. The combination of my pipe and tomatoes has shown up in my garden in the form of tobacco mosaic virus. Also get rid of nightshade, jimsonweed, or horse nettle in the vicinity. Once the virus gets in, insects may spread it from plant to plant. Control the insects, and you may control the virus. After handling infected plants, wash your hands well before handling one you think is clean.

**Leaf spots and blights.** There are several very common fungus diseases of tomato plants. The principal ones are early blight, *Septoria* leaf spot, late blight, anthracnose, and soil rot.

These are infectious diseases that can, do, and will hit tomato plants in the home garden. They will not always wipe out the plant, nor will they always prevent you from getting tomatoes. Infection can be heavy or light, depending on a lot of conditions.

In controlling disease, anything we can do to prevent disease spread is our first line of defense. How do we do this? Don't take prevention lightly! Clean up the old plants after picking, and destroy them by burning or putting them on the compost pile until fully and completely decayed. This can break the disease cycle from one year to the next for some problems.

Don't grow tomatoes where you had potatoes last year. There will generally be a late blight infection source in the potatoes you missed harvesting.

Don't crowd plants so that they stay wet for long periods of time. Warm weather and wet leaves for several hours are all that are needed for disease spores to germinate. The quicker the plant dries out, the less chance of infection from fungus diseases. Staking plants is a great help. I like to put tomatoes where the breezes can hit them.

Rotate tomatoes from one place to another in the garden. Always give them a good spot so they can be healthy and vigorous. Wait three or four years before you return to the same place if you have been having disease problems. Keep weeds out of the tomato patch. Some may harbor the disease-causing organisms, and they keep plants from drying out quickly.

Bring in clean plants if you buy them, clean seed from a reputable source if you start your own. Beware of tomato plants that already have leaf spots.

## *Fungicides*

Preventive actions are the best defense for the home garden tomato grower. If these do not give satisfactory control, then you must go to the home gardener's last line of defense, which is prevention by regular fungicide applications before you see evidence of the disease.

If you are trying to grow tomatoes in a community garden where there are all kinds of sources of infection around, or where you have had a history of severe infections, you may have to go the fungicide route to bring a decent crop through. See your local agricultural extension agent for current fungicide recommendations, rates, and timing.

If there is anything I'd like not to be, it would be a plant pathologist, a plant disease man. He sees sick, diseased plants and, for the most part, he can tell people only what they should have done to prevent the plants from being sick. When you deal with tomato disease, you are dealing with disease prevention, or else some tolerance of disorders. I'd recommend a large dose of preventive measures, a reasonable dose of tolerance, and *some* damage in the home garden situation. I'd go the fungicide route only if my tolerance level was exceeded. The fact is, I've brought through tomato crops — not perfect ones — every year for decades without a regular fungicide program. There have been years when I'd have done better had I been on a fungicide program, but I plan on growing a few extra tomatoes to stave off partial disease disaster. (If I were growing tomatoes for a living, though, I'd be out of business.)

On a commercial scale, where spread of disease is certain and partial loss or imperfect fruit isn't tolerable, prevention by use of fungicides is another story indeed.

# Pests

Pests fall into three categories. One is insects. One is slugs. And one is animals. About most animals, all you can do is fence the garden or buy a dog whose presence will frighten off raccoons, groundhogs, rabbits, and other hungry critters. Or plant enough to share with them if you are feeling generous.

## *Insects*

There aren't many insects that will be troublesome year after year on tomatoes. The cutworm, a C-shaped larva of several species of moths, can go down the row and chop off your newly set plants at or just below soil level. If you are on the ball and see where he has hollered "timber" on one plant, you can dig him out and "do him in" on his way to the next plant. If cutworms are around, you can place a collar around the plant and sink it 2 inches into the soil. A collar can be made from a milk carton or a tin can with both ends cut out.

The black potato flea beetle is just about always present soon after you set out the plants. He eats a lot of little holes in the leaf of a plant, making it look like a sieve. He can damage and even kill the plant. Apply an approved insecticide in dust form. When you see damage occurring as the plant gets larger, the insect can be ignored. We used to control the flea beetle with wood ashes. I think the burn on the leaves caused by the wood ashes hurt the plant more than the flea beetle was likely to.

The tomato hornworm is famous for its size, even though it isn't too prevalent, nor very damaging if you stay awake. If one appears on a plant, it can devour a large section of the leaves. Your job is to notice this and stop its chewing in a more or less permanent fashion known as heeling (stepping on it). Another method of disposal is in a bottle of alcohol, which allows the kids to admire their finger-sized and beautiful larva with a horn. In home gardens, hand picking is adequate control. Most of you won't see one for years.

Aphids will now and then break free of their natural controls and multiply geometrically, rapidly. Leaf curling will be in evidence. Here, as in all insect control, we spray insects and not plants. If you spray in anticipation of aphids, you'll knock out the natural predators that normally keep them in check and you'll have to fight aphids continuously. Only if aphids get out of hand do you worry,

and one application will usually bring them under control.

There are a dozen or so other insects that may show up now and then, or in your particular garden they may show up every year. By and large, however, insect problems on tomatoes are fairly easy to handle, and to tolerate. They are not as much of a problem as disease control.

## Slugs

Slugs aren't insects, but if you have them, they can be worse than most insects you could imagine. They are snails without shells. They multiply and appear in numbers and damage tomato plants and fruit as well as many other vegetables. They are most prevalent in soils that tend to be wet and remain wet. They are most troublesome under heavy mulches. The only effective way of control I know of is the use of slug baits. The beer method, the sandpaper method, the salt method, and all other methods seem to end up as theories when the slugs get serious about eating.

It does help with slugs and some indigenous insects to get the tomatoes up off the ground so that the tomato isn't lying there asking for injury.



Cutworm



Aphid



Slug

# Harvesting

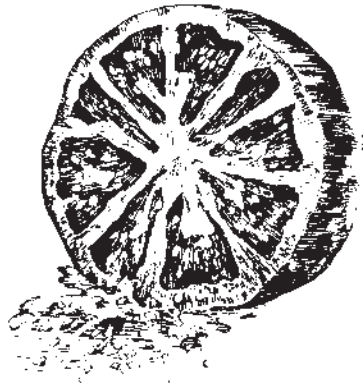
Tomatoes and frost don't get along, so you must either harvest them ahead of a frost or cover them so that the frost won't damage them. Neither the leaves nor the fruit will take much cold.

The "ripe-off-the-vine" superiority theory of the tomato is all right with me. But I wouldn't take much of a chance on frost just to prove the theory. When a green tomato starts to show a whitish color on the blossom end, you can pick it, lay it out on newspapers on the porch or the garage floor, and it will ripen off pretty normally. As far as my taste goes, it is as good when ripe as one from the vine. Some folks say this is not so, by golly! I have ripened off many tomatoes a month or six weeks after picking them green. Half-grown ones will eventually ripen if they are fairly free of disease.

I'd suggest you use the smaller, firmer green ones for your green tomato pickling and preserves, and give the larger ones a chance to ripen, to extend your fresh tomato season and give you sizable ones for processing.

I do not try to ripen them indoors. They ripen too fast, and I want to extend the season. I use old coats and blankets to protect them from freezing as cold becomes more intense. As early November comes, we fill up the vegetable compartment with the ripe ones, give away or process the rest, and call it quits for the year.

I realize that some people pull the whole plant and hang it upside down on the withering vine. All right, if you have hanging room. Some folks bury them in hay. I guess it works, but mine ripen without the hay. In any case, keep them dry while ripening. Wetness will bring on more spreading of rot organisms and more decay.



## Kinds and Varieties

If you do a good job of growing tomatoes, you'll swear by the variety that responds to your green thumb. At the same time, few of us, and probably none of us, have tried and have honestly rated any great number of the hundreds of varieties available. Suffice it to say that there are enough good VF (verticillium-fusarium wilt-resistant) varieties available so that I'd chuck the rest and let somebody else get the wilt.

The growth habit of tomatoes can be determinate, where a plant grows up so high and stops and, in theory, fruits. Most, however, are indeterminate and will keep on growing like Jack's beanstalk. Weather conditions being ideal, I suppose they'd keep right on. Quite a lot of your small cherry-size tomatoes are determinate, as are some of the very early-maturing ones, but we find some of our old standards are determinate, too. I don't worry much because I have found the frosty weather about mid-September tends to make functional determinates out of even the better indeterminates. Don't worry too much about this. I'm sure some good tomato gardeners go through life not knowing the difference and not caring. In fact, the variety 'Springset' is "semi-determinate." You figure that one out!

So how do we choose? First, we get VF resistance if it is available. If the seed pack says nothing about VF resistance, better look for one that does, or get out the seed catalogs. Second, what are you going to use it for?

Key to resistance qualities: V = verticillium wilt; F = fusarium wilt; N = nematodes. Days given are from transplant into the garden to first fruit.

- If you want to make tomato paste, an excellent choice of tomato is '**Milano**' VF (63 days). Milanos are also good in salads and sauces and for drying. Or you can use good old '**Roma**' VF (75 days), which is still popular after many years, or '**La Rossa**' VF (75 days).
- For small cherry-type tomatoes, try '**Super Sweet 100 Hybrid**' VF (65 days), '**Camp Joy**' (65 days), or '**Ruby Pearl**' (67 days). All are heavy-bearing.
- For varieties suitable for growing in pots (in addition to the cherry-types above), there are '**Tumbler**' (very early at 49 days) and '**Superb Super Bush**' VFN (70 to 75 days). For people who don't have land for a garden, the little cherry tomatoes can be grown in pots on the patio.

- Good early-season choices include **'Early Girl Hybrid'** VF (57 days), **'Early Cascade Hybrid'** VF (63 days), and **'Dona'** VFN (65 days).
- Midseason varieties you may especially enjoy are **'Celebrity Hybrid'** VFN (70 days) and **'Red Sun'** F (72 days), which is large and also crack-resistant. **'Enchantment'** VFN (68 days) also has many fans, particularly since it never needs spraying.
- Main-season tomatoes recommended by many include **'Better Boy Hybrid'** VFN (70 days), **'Red Sun'** VFN (72 days), **'Enchantment'** VFN (70 days), and **'Miracle Sweet Hybrid'**



## Saving Seeds

Tomatoes are either hybrid or open pollinated. If they are hybrid, they will not breed true from the seeds. If you have an open-pollinated variety, however, you can save the seeds for planting next year.

1. Look for the healthiest plant that suits your needs, whether it fruited early, bore well, or had the tastiest fruits. Mark the plant or plants you have selected by tying a colored flag to the stake, cage, or trellis near the plant.



2. Leave a tomato or two on the plant until they are just past perfect eating ripeness, but not rotting. This will guarantee that the seeds are mature. Pick the fruit, cut the tomato in half, and use a spoon to scrape out the seeds.

3. Each seed is encased in a membrane about the consistency of jelly. To improve germination rates next spring, it is a good idea to get rid of this membrane before you

VF (69 days). In addition, there's '**Carmello**' VFN (70 days), a French hybrid that Shepherd's Seeds calls "the best tomato ever."

- For those craving giant, beefsteak-type tomatoes, there are '**Beefmaster Hybrid**' VFN (80 days) and '**Big Beef Beefsteak**' VFN (75 days).
- If you live in the North, think about '**Oregon Spring**' V (58 days and quite cold-tolerant) and '**Pilgrim Hybrid**' VF. In addition, northern gardeners have reported great results from '**New Yorker**' V (60 days) and '**Jet Star Hybrid**' VF (70 days).

dry and store the seeds. To do this, you will ferment the seeds. Place them in a jar and add about ¼ cup of water. Put the cap on the jar, but don't screw it on tightly. Keep the jar on the kitchen counter. The contents will turn murky and will begin to smell a bit ripe. Stir daily. The good seeds will sink to the bottom and the infertile ones will float along with the fermented pulp. After 2 or 3 days, pour off the floaters and the liquid. Then dump the good seeds into a strainer and wash them well.



4. Spread out the rinsed seeds on several layers of newspaper to dry. After a few days, they should be dry and will not stick to the newspaper. If they seem to dry slowly, change the newspaper underneath every day. When thoroughly dry, place the seeds in an airtight container (like a babyfood jar) and store in a cold, dry place — a refrigerator, freezer, or cold pantry.

—Adapted from **Step-by-Step Gardening Techniques Illustrated**. Written by Nancy Bubel and illustrated by Elayne Sears.



- And then there are the tomatoes in various colors — pink, yellow, orange, purple, and even white. Most of these have many fans, because of their low acidity and delicious taste. Some good varieties of non-red tomatoes are **‘Pink Odoriko’** VFN (76 days), **‘Lemon Boy Hybrid’** VFN (70 days), and **‘Sweet Tangerine’** VFN (68 days).
- Finally, if you’re interested in tomatoes that will keep well, look at Burpee’s **‘Red October Hybrid’** VFN (68 days) and **‘Long-Keeper’** (78 days).

The reason I go through the process of growing my two dozen or so plants is that when I go out to buy plants, I can’t get a variety I want to take a chance on in many cases. Hence, I start on my own. Besides, it keeps my thumb green longer. I cannot grow as nice a plant, sturdy and strong, as the man who has the greenhouse.



## *In Spite of You*

Whenever I write about all the diseases, weeds, pests, frosts, or methods, I’m afraid the new tomato grower will figure that if all of these troubles occur, he’d better grow something easier. In practice, tomatoes are one of the easiest vegetables to grow. Certainly, all of the problems outlined won’t hit you in any one year. And some never will.

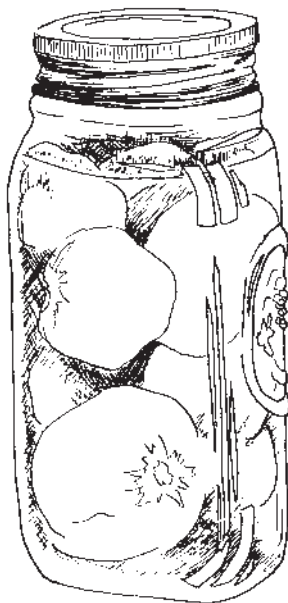
## **Safe Home Canning**

“Low-acid” varieties of tomatoes have been blamed for botulism in home-canned tomato products. As a result, these fine varieties have received undeserved criticism. To the contrary, it has been concluded by government scientists that it is not “low acid” but low heat that causes the growth of the deadly bacteria in home-canned products.

The so-called “low-acid” tomatoes actually contain normal levels of acidity. It is because these tomatoes are slightly sweeter to the taste than other varieties that they have been dubbed “low acid” by writers of seed catalogs. Only very overripe tomatoes have an acid level low enough to support the botulism bacteria.

It is not, then, “low-acid” tomatoes but rather microorganisms present in the tomato product before heating that probably cause botulism. The metabolic activities of these microorganisms may reduce the acid content of the tomatoes to a level at which the bacteria could grow.

Correct heat treatment will eliminate these microorganisms and, with them, the threat of botulism. Therefore, if you want to avoid botulism, don’t avoid “low-acid” tomatoes. Avoid overripe ones. Most important, be sure to follow reliable rules for canning. And follow the directions for heating as if your life depended on it. It just might.



## Sources for Tomato Seed

### **Johnny’s Selected Seeds**

877-564-6697

*www.johnnyseeds.com*

### **Park Seed Co., Inc.**

800-213-0076

*www.parkseed.com*

### **Pinetree Garden Seeds**

207-926-3400

*www.superseeds.com*

### **Seeds Trust, Inc.**

928-649-3315

*www.seedstrust.com*

### **Tomato Growers Supply Co.**

888-478-7333

*www.tomatogrowers.com*

### **W. Atlee Burpee Seed Co.**

800-888-1447

*www.burpee.com*

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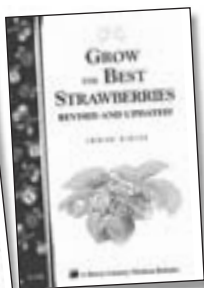
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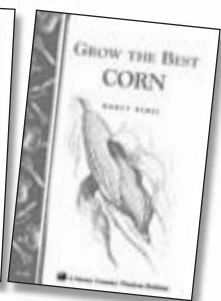
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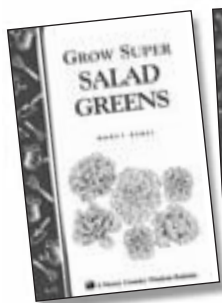
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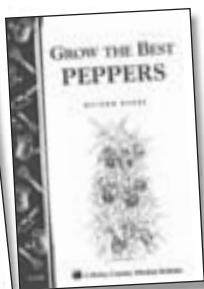
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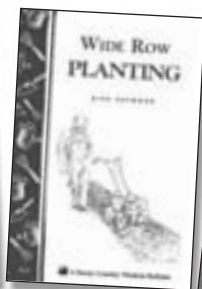
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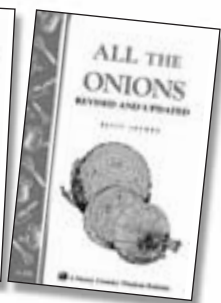
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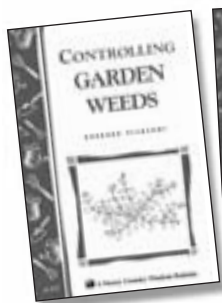
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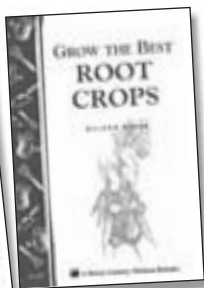
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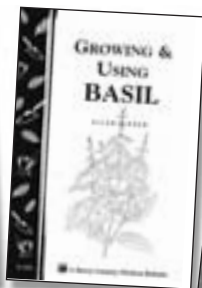
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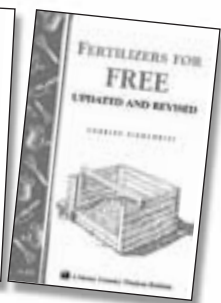
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