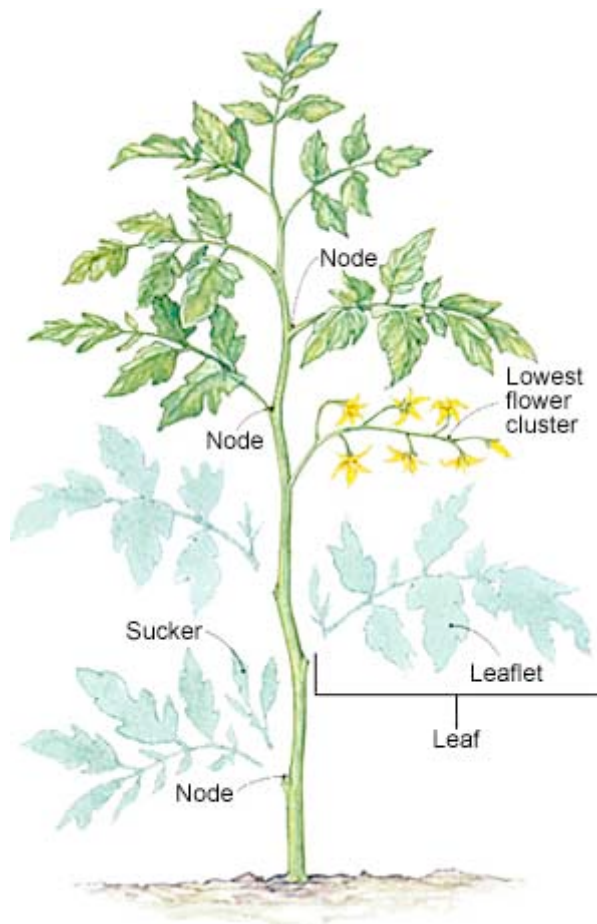


# Pruning Tomatoes

## How to manage your plants for better health and better fruit

by Frank Ferrandino

Undoubtedly, the main reason tomatoes are so widely grown is that home-grown tomatoes taste so much better than their store-bought counterparts. But another reason is the intrinsic vigor and hardiness of this nightshade relative, which almost always guarantees a successful harvest. However, the rapid growth of a healthy tomato plant can also lead to problems.



Like all plants, a tomato is a solar-powered sugar factory. For the first month or so it's in the garden, all of the sugar it produces is directed towards new leaf growth. During this stage, tomato plants grow very rapidly, doubling their size every 12 to 15 days. Eventually, the plants make more sugar than the single growing tip can use, which signals the plant to make new branches and to flower. This usually happens after 10 to 13 leaves have expanded, at which time the plant is 12 to 18 inches tall. In the next few weeks, the entire character of the tomato plant changes. If unsupported, the increasing weight of filling fruit and multiple side branches forces the plant to lie on the ground. Once the main stem is horizontal, there is an increased tendency to branch. Left to its own devices, a vigorous indeterminate tomato plant can easily cover a 4- by 4-foot area with as many as 10 stems, each 3 to 5 feet long. By season's end, it will be an unsightly, impenetrable, disease-wracked tangle.

## **Prune for plant structure and health**

With tomatoes, we want to maximize the efficiency of photosynthesis and minimize the risk of disease. This is best accomplished by ensuring that each leaf has plenty of room and is supported up off the ground. When a tomato plant lies on the ground, or when its growth is extremely dense, many of its leaves are forced into permanent shade, greatly reducing the amount of sugar they produce. There is no free ride in the plant world. If a leaf uses more sugar than it makes, a layer of abscission cells develops between the main stem and the leaf petiole; eventually the leaf yellows and drops. Of course, sloughed-off leaves are replaced by new ones, but time is wasted. Prostrate plants get around to fruit production two or three weeks later than a pruned and staked plant. Most of the fruits they do produce are on the

### **RULE 1**

**Get plants off the ground.**

### **RULE 2**

**Give plants room.**

### **RULE 3**

**Never prune or tie plants when the leaves are wet.**

small side, and tend to come in one big, late harvest.

A properly pruned and supported single-stem tomato plant presents all of its leaves to the sun. Most of the sugar produced is directed to the developing fruit, since the only competition is a single growing tip. The result is large fruits that are steadily produced until frost. If more stems are allowed to develop, some of the precious sugar production is diverted from fruit to multiple growing tips. Fruit production, although slowed, never stops. The result is a nearly continuous supply of fruits throughout the season. In general, more stems means more but smaller fruits, which are produced increasingly later in the season. (This is much less applicable to determinate plants, due to their shortened growing season and better-defined fruiting period. Therefore, determinate plants require little pruning.)

Pruning also affects plant health. The leaves of a pruned and supported plant dry off faster, so bacterial and fungal pathogens have less opportunity to spread. Soil is less liable to splash up onto staked plants. The bottom line: Upright plants have fewer problems with leaf spots and fruit rots because their leaves stay drier and free from pathogen-laden soil.

The way you choose to train and prune your tomato plants will affect how you space your plants, as well as the best method of support. There's no one right way to do it. Instead there are a few good patterns to follow.

## **Side stems affect plant vigor**

As a tomato grows, side shoots, or suckers, form in the crotches, or axils, between the leaves and the main stem. If left alone, these suckers will grow just like the main stem, producing flowers and fruit.

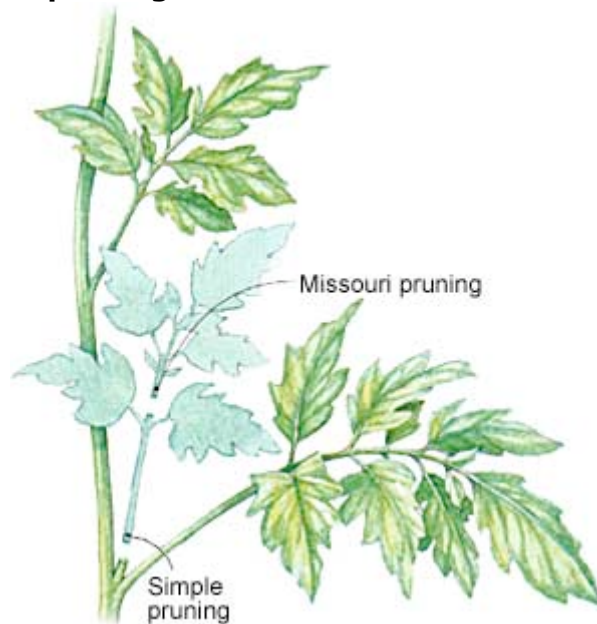
Suckers appear sequentially, from the bottom of the plant up. The farther up on the plant a sucker develops, the weaker it is, because the sugar concentration gets lower as you move up the plant. On the other hand, side stems arising from below the first flower cluster, although stronger, compromise the strength of the main stem. For a multi-stemmed plant, your aim is to have all stems roughly the same size, although the main stem should always be stronger, because it has to feed the entire plant for the next five or six months. Here's how I achieve this.

I keep tomatoes free of side stems below the first fruit cluster. When trained to one vine and left free-standing, tomato plants develop strong main stems. To encourage a strong stem, I remove all suckers and I don't tie plants to their supports until the first flowers appear.

Determinate tomatoes need no pruning other than removing all suckers below the first flower cluster, because pruning won't affect their fruit size or plant vigor. If you do any pruning at all above the first flower cluster on determinate tomatoes, you'll only be throwing away potential fruit.

Indeterminate tomatoes can have from one to many stems, although four is the most I'd recommend. The fewer the stems, the fewer but larger the fruits, and the less room the plant needs in the garden. For a multi-stemmed plant, let a second stem grow from the first node above the first fruit. Allow a third stem to develop from the second node above the first set fruit, and so forth. Keeping the branching as close to the first fruit as possible means those side stems will be vigorous but will not overpower the main stem.

### Simple vs. Missouri pruning



There are two ways to deal with a sucker that isn't destined to become a stem. The simplest is to pinch it off entirely; not surprisingly, this is called "simple pruning." This should be done when the sucker is still small and succulent. Grab the base of it between your thumb and index finger and bend it back and forth. The sucker should snap off, producing a small wound, which will heal quickly. Avoid cutting the sucker with a knife or scissors, because the resulting stump can become easily infected. Once a sucker becomes too tough and leathery to snap off, however, you'll have to use a blade. I recommend a retractable razor knife.

In Missouri pruning, you pinch out just the tip of the sucker, letting one or two leaves remain. The advantage is that the plant has more leaf area for photosynthesis and to protect developing fruit from sun-scald. The disadvantage is that new suckers inevitably develop along the side stems, adding to your future pruning chores. Personally, I prefer Missouri pruning, despite its shortcomings. I relish revisiting each Missouri-pruned side stem, repeatedly reinforcing my initial godlike decision to cut or not to cut. Either method works, though, so enjoy your newfound power.

Missouri pruning is necessary when things have gotten out of hand. When you're dealing with large suckers, it's better to pinch off just the tip than to cut off the whole thing close to the main stem. For one thing, if disease hits, it's farther away from the main stem. And for

another, removing just the growing tip is less of a shock to the plant than removing a foot or so of side stem.

You'll find that suckers grow very quickly during the hot summer months. I can't count the times I've returned home from a five-day road trip in July to find my formerly well-tended tomatoes covered with foot-long suckers growing in all the wrong directions. This is indeed a situation that tests one's resolve. It helps to know that side stems started this late in the season will always be spindly and produce inferior fruit. You must be heartless and tip them all.

### **Blest be the tie that doesn't bind**

Once flowering commences, all tomato vines must be tied to their supports. Although vigorous, the plants are also easily damaged, so take care in how you tie them and what you use. Cloth strips work well as long as they're not too old and threadbare. Pieces of panty hose cause the least damage to plants, but they're not biodegradable. Twine should be at least 1/8 inch thick, or else it can cut into the tomato stems. Twine made of natural fibers like jute or sisal will break down sufficiently over winter not to cause problems with tiller tines, as panty hose would.

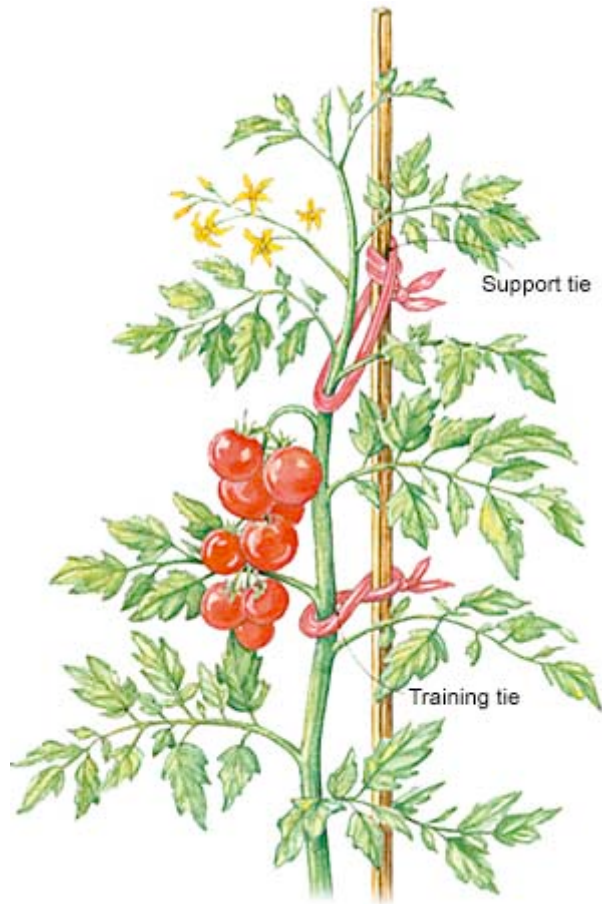
There are two types of ties. Training ties direct plant growth upwards, and supporting ties keep it there. The top foot of a tomato stem, or leader, is very succulent and easily snapped; it needs to be directed upwards, gently. I wrap a short piece of twine around the middle of the leader, cross it over on itself, and loosely tie it to the support. The resulting figure-eight tie reduces the chance the tender stem will rub against the support and get bruised.

Fruit will form along this stem. If left to the devices of the loose training ties, the weight of the fruit will pull the ties down the stake. Eventually, the stem will bend over and crease. Luckily, as the stem matures, it toughens; by the time fruit develops, the stem can tolerate a tighter tie. To support a fruit cluster as it fills and gains weight, I loop a longer piece of twine, 12 to 18 inches, around the stem just above the fruit cluster, creating a sling. Then I gently pull it up to take the weight off the stem. I wrap the twine twice around the stake, and firmly tie it to the stake 6 to 10 inches higher than the point of attachment to the vine. To keep the tie from slipping, I knot it underneath the point where the sling meets the stake.

### **A final pruning pays off**

Later in the season, about 30 days before the first frost, there is one last pruning chore. The plants must be topped. The fruit that has set must be given every opportunity to mature. To this end, I direct all carbohydrates produced by the plant to the fruit by removing all the growing tips. This, too, can be hard to do. Every gardener is reluctant to admit the season is coming to an end. However, this final pruning can make all the difference between hard, green fruits, hurriedly picked before frost, which later rot in a paper bag, and ripe, home-grown tomatoes in your Thanksgiving salad. Be tough, fight your nurturing instincts, and top those plants.

Frank Ferrandino is an associate scientist in the Department of Plant Pathology and Ecology at the Agricultural Experiment Station in New Haven, Connecticut.



## How to Tie

There are two reasons to tie tomatoes, and there's a different tie for each one. Train the leader to grow upright with a loose, figure-eight tie. To support burgeoning fruit, loop a long tie above a fruit cluster, and tie it to the stake 6 to 10 inches higher. Loop the tie twice around the stake and tie it tightly so the tomatoes don't pull it down with their weight.

Drawings: Susan Carlson

From *Kitchen Gardener* #27, pp. 16-19