



# Tomatoes

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Photo by Hartmut Rühl, from Pixabay.

## Environmental Preferences

**Light:** Sunny.

**Soil:** Well-drained, loam.

**Fertility:** Medium-rich.

**pH:** 5.5 to 7.5.

**Temperature:** Warm (70° to 80°F).

**Moisture:** Moist, but not waterlogged.

## Culture

**Planting:** Transplant after all danger of frost has passed and when the soil has warmed.

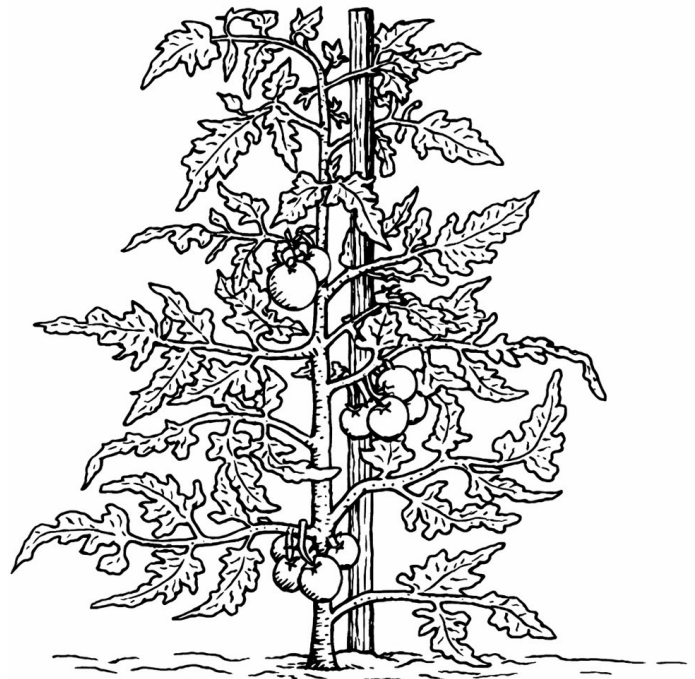
**Spacing:** 18 to 36 inches by 36 inches if staked or caged.

**Hardiness:** Tender annual.

**Fertilizer needs:** Heavy feeder. In the absence of a soil test, use starter solution for transplants. Begin sidedress one to two weeks after the first hand or cluster of tomatoes begins to develop with 3 tablespoons 33-0-0 per 10-foot row. Sidedress again two weeks after the first ripe tomato with a balanced fertilizer such as 5-10-5; repeat one month later.

## Cultural Practices

Tomatoes are valuable garden plants because they require relatively little space for large-scale production. Each standard tomato plant, properly cared for, yields 10 to 15 pounds or more of fruit.



Choose varieties with disease resistance bred in for the best results. Letters after the variety name indicate tolerance or resistance to the following:

- Fusarium Wilts Race 1(F)
- Early Blight (EB)
- Fusarium Wilt Race 1 and Race 2 (FF)
- Root-knot Nematodes (N)
- Septoria leaf spot (SLS)
- Tobacco Mosaic Virus (T)
- Gray leaf spot (GLS)
- Alternaria Stem Canker/Crown Wilt (AS)

The varieties of tomato plants available may seem overwhelming to a new gardener; ask gardening friends for the names of their favorites. This will give you a good idea of what does well in Virginia. [Virginia Cooperative Extension Publication 426-480, Vegetables Recommended for Virginia](http://www.ext.vt.edu/426/426-480.html) (pubs.ext.vt.edu/426/426-480.html), may also be helpful. Several major types of tomatoes exist that can be chosen according to need:

### Based on plant characteristics

- a. **Patio**, or **dwarf** tomato varieties have very compact vines and are best grown in hanging baskets or other containers. The tomatoes produced may be, but are not necessarily, of the cherry type (1 inch or less in diameter). Some produce larger fruit. These plants are usually short-lived, producing their crop quickly and for a short period.
- b. **Compact** or **determinate** tomato plants have a plant habit of growing to a certain size, setting fruit, and then declining. Most of the early-ripening tomato varieties are determinate and will not produce tomatoes throughout a Virginia summer.
- c. **Indeterminate** tomato plants are the opposite of the determinate types. The vines continue to grow until frost or disease kills them. These are the standard, all-summer tomatoes that most people like to grow. They require some support for best results, since otherwise the fruit would be in contact with the soil and thus susceptible to rot.

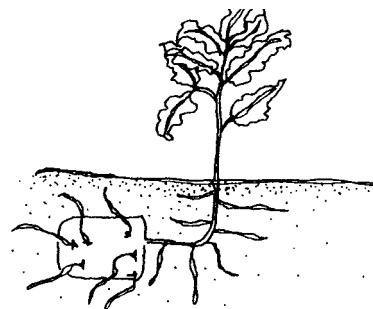
### Based on fruit characteristics

- a. **Cherry** tomatoes have small, cherry-sized fruits (or slightly larger) that are often used in salads. Plants of cherry tomatoes range from dwarf (Tiny Tim) to seven-footers (Sweet 100). One standard cherry tomato plant is usually sufficient for a family, since they generally produce abundantly.
- b. **Beefsteak** type tomatoes are large-fruited types, producing a tomato slice that easily covers a sandwich, and the whole fruit weighs as much as 2 pounds or more. These usually ripen late, so plant some standard-sized or early tomatoes for the longest harvest.
- c. **Paste** tomatoes have pear-shaped fruits with very meaty interiors and few seeds. They are less juicy than standard tomatoes and are without a sizeable central core. Paste tomatoes are a favorite for canning because they don't have to be cut up, and since they are so meaty.
- d. Tomatoes come in a variety of **colors**, including orange, yellow, pink, and striped, and often the only way to get a specific one is to grow your own. Most are heritage varieties obtained through seed-saver groups. Tests have shown that there is no relationship between tomato color and acidity.

### Planting Tomatoes

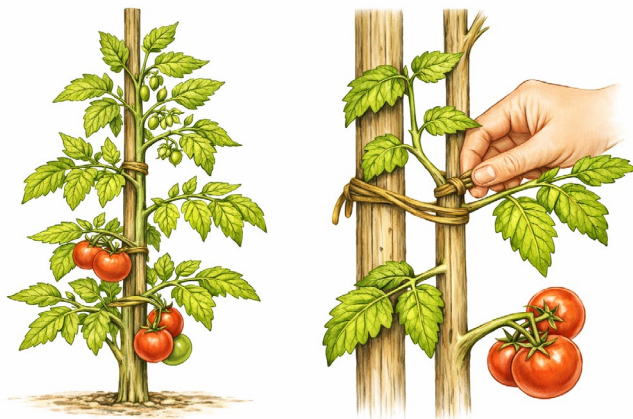
Tomato plants may be started indoors from seed or purchased as transplants. If starting your own plants, use a light soil mix and provide them with plenty of light. Tall, spindly transplants are usually caused by low light levels in the home. Unless you have a sunny, south-facing window, supplemental light will probably be necessary. The seeds are sown six to eight weeks before the last frost date in your area. A few weeks before transplanting, harden off indoor-grown plants by gradually increasing the number of hours they spend outdoors each day. Bring plants in if there is danger of frost.

When you are ready to put home-grown or purchased plants into the ground, select stocky transplants about 6 to 10 inches tall. Set tomato transplants in the ground, covering the stems so that only



two or three sets of true leaves are exposed. Horizontal planting of tomato plants is an effective way to make plants grow stronger, especially leggy ones. Roots will form along the buried portion of the stem, promoting better growth and reducing the risk of plant injury from a too-weak stem. Do not remove the containers if they are peat or paper pots, but open or tear off one side to allow roots to get a good start. If non-biodegradable containers are used, knock the plants out of the pots before transplanting, and loosen the roots somewhat. Press the soil firmly around the transplant so that a slight depression forms to hold water. Pour approximately one pint of starter solution fertilizer around each plant to wash the soil around the roots.

Plants should be staked or caged. Though it requires more initial work, this makes caring for tomatoes easier than letting them sprawl. Since they are off the ground, fruit rots are reduced, spraying is easier and may be required less, and harvesting is much less work. **For staking**, space them 24 inches apart in rows 3 feet apart. Use wooden stakes 6 feet long and 1 1/2 or 2 inches wide. Drive them 1 foot into the soil about 4 to 6 inches from the plant, soon after transplanting. Attach heavy twine or strips of cloth to the stakes every 10 inches. As the plants grow, pull the stems toward the stakes and tie loosely. Prune staked tomatoes to either one or two main stems. At the junction of each leaf and the first main stem a new shoot will develop. If plants are trained to two stems, choose one of these shoots, normally at the first or second leaf-stem junction, for the second main stem. Remove all other shoots, called suckers, weekly to keep the plant to these two main stems. Pinch shoots off with your fingers. Tomato plants may also be set along a fence or trellis and tied and pruned in a manner similar to that used with stakes.



**Growing tomatoes in wire cages** is a popular method among gardeners because of its simplicity. Cage-growing allows the tomato plant to grow naturally, while keeping the fruit and leaves off the ground. Using wire cages requires a large initial expenditure and a large storage area, but many gardeners feel that the freedom from pruning and staking is worth it. The cages, if heavy-duty, will last many years. Be sure to get fencing with at least 6-inch spacing between the wires so that you can reach in to harvest the tomatoes. If tomato plants in wire cages are pruned at all, once is enough; prune to three or four main stems. Wire-cage tomatoes develop a heavy foliage cover, reducing sunscald on fruits and giving more leeway when bottom leaves become blighted and have to be removed. Many staked plants are nearly naked by late summer. Caged plants are less prone to the spread of disease from plant handling, since they do not have open wounds and must be handled less frequently than staked plants. However, it helps to space the plants somewhat further apart (3 feet is good) to allow good air circulation between plants. Because humidity is higher due to the foliage density, diseases, such as late blight, spread rapidly in humid conditions. If well-nourished and cared for, caged tomatoes can produce exceptional harvests and make up for the lack of extra space with high yields. This type of culture is especially suited to indeterminate varieties.



## Causes of Poor Tomato Fruit Set

The transition of a flower into a young fruit is very sensitive to several environmental factors over which gardeners have some control. The following is a brief discussion of some of the causes of poor tomato fruit set with particular emphasis on urban gardening.

**Temperature and Humidity.** Daytime temperatures above 90°F and nighttime temperatures above 70°F reduce flowering and fruit set. There is considerable evidence that night temperature is the critical factor in setting tomato fruit, with an optimal range of 59° to 68°F. With night temperatures much below or above this critical range, fruiting is reduced or absent. Low temperatures reduce the production and viability of pollen. High temperatures, especially when accompanied by low humidity and moisture, hinder fruit set by impairing pollination and/or fertilization.

**Plant Nutrition.** Reduced fruiting may result from either stunted or excessively vigorous vegetative growth. Injury from disease and insects, especially sucking insects such as aphids and thrips, can severely check growth. Inadequate moisture and/or available nitrogen can hinder growth and flower production. Conversely, abundant water and nitrogen can stimulate rapid vegetative growth, leaving low levels of carbohydrates for the normal processes involved in fruit set.

Garden sites located on heavy subsoils are infertile and poorly drained. Gardeners create nutrient deficiencies by either not applying fertilizer or by adding too much. In addition, irrigation water is often unavailable during droughts.

**Photoperiod** (length of day). Although the tomato plant can flower and fruit at any day length (day-neutral plant), fruit set is retarded under continuous light. Thus, tomato fruit set may be reduced under the continuous illumination, as in some environments.

## Common Problems

**Diseases:** Early blight, septoria leafspot, verticillium and fusarium wilts, late blight, tobacco mosaic virus, bacterial spot, Southern blight.

**Insects:** Flea beetle, hornworm, stink bugs, Colorado potato beetle, fruitworm, aphids, mites, whiteflies, cutworms, Japanese beetles.

**Other pests:** Nematodes.

**Cultural:** Blossom-end rot, irregular soil moisture or calcium deficiency; poor color, yellow spots or large whitish-gray spots, sunscald from lack of foliage cover; leaf roll, a physiological condition often found in pruned tomatoes; fruit cracking, irregular soil moisture; black walnut wilt, caused by roots of tomato plants coming in contact with toxin from black walnut tree.

Refer to the current year's version of Virginia Cooperative Extension's Pest Management Guide - [Home Grounds and Animals, Home Vegetable Chapter](https://www.pubs.ext.vt.edu/456/456-018/456-018.html) for current control recommendations (<https://www.pubs.ext.vt.edu/456/456-018/456-018.html>).

## Harvesting and Storage

**Days to maturity:** 55 to 105 days.

**Harvest:** Harvest fully vine-ripened but still firm. Picked tomatoes should be placed in the shade. Light is not necessary for ripening immature tomatoes, but it is necessary for color development. Some green tomatoes may be picked before the first killing frost and stored in a cool (55°F), moist (90% relative humidity) place. When desired, ripen fruits at 70°F.

**Approximate yields:** 15 to 45 pounds per 10-foot row.

**Amount to raise:** 20 to 25 pounds per person if used fresh; 25 to 40 pounds for canning.

**Storage:** Medium-cool (50° to 70°F), moist (90% relative humidity) conditions for one to three weeks for green tomatoes. Cool (45° to 50°F), moist (90% relative humidity) conditions for four to seven days for ripe tomatoes.

**Preservation:** Can or freeze as sauces or in chunks (whole or quartered), peeled.

## Heirloom Tomatoes

Heirloom tomato varieties are treasures from the past. Chosen for outstanding flavor, color, or overall performance, they can be grown in your garden, but probably never be found in a supermarket. However, heirlooms may be more prone to disease and therefore require more maintenance. Because heirlooms breed true—meaning their characteristics remain stable—you can save their seeds and plant them again the following season.

With changes in food production trends after WWII, there came a need to develop tomatoes that could be harvested green, withstand shipping, etc., and maintain a good, uniform appearance. These qualities were achieved through hybridizing. The sacrifice of this breeding was flavor – which, in recent years, scientists have been trying to re-introduce. Though hybridized tomatoes have their place, heirloom tomatoes definitely surpass them in one general characteristic – their taste.

Here are some common heirloom tomato varieties you may want to try:

- **Big Rainbow** – This very large tomato is a gold/red bicolor, and is described as being meaty and mild-flavored.
- **Brandywine** – This large beefsteak variety tomato is legendary for its “exceptionally rich, succulent flavor” and “old-fashioned tomato taste.” An Amish heirloom, it is solid pink-red.
- **Black Krim** – This Russian beefsteak variety is deep maroon red when ripe. It is a medium-sized tomato that has a “rich” flavor.
- **Evergreen** – When ripe, this juicy and flavorful tomato is green with yellow highlights.
- **Green Zebra** – This green and yellow tomato has “a sweet zingy flavor” and is “as sweet as an apple.” It is beautiful when served with yellow, red, orange, and pink varieties.
- **Stupice** – This smallish Czechoslovakian tomato is great for northern climates, ripens early, and is very productive. It is a smooth red tomato with great flavor.
- **Yellow Pear** – This variety produces an endless supply of yellow, bite-sized, pear-shaped fruit with a mild flavor.

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