



**CORNELL  
COOPERATIVE  
EXTENSION OF  
ONEIDA COUNTY**

# HOME GROWN FACTS

121 Second Street Oriskany, NY 13424-9799  
(315) 736-3394 or (315) 337-2531 FAX: (315) 736-2580



## GROWING TOMATOES

The most popular garden vegetable crop, tomatoes come in a wide range of sizes, shapes and colors. Choose determinate varieties for early harvest or cool conditions. Compact varieties are also good choices for containers and planting in flower beds.

### Site Characteristics

#### Sunlight:

- full sun

Tomatoes need at least 8 hours of direct sun daily.

#### Soil conditions:

- tolerates acid soil
- requires well-drained soil

Prefers well-drained, fertile soil, high in organic matter. Clays and loams produce the highest yields. But lighter soils that drain and warm quickly can produce earlier harvests -- particularly if they are on a slight slope to the south or southeast. Can tolerate slightly acid soils, as low as pH 5.5. But produces best when pH is 6.0 to 6.8. Consistent moisture needed to prevent blossom end rot, but does not tolerate waterlogged soils.

#### Special locations:

- outdoor containers - Small, determinate or miniature varieties work best. Requires frequent watering

### Plant Traits

#### Lifecycle: annual

Tender annual

#### Ease-of-care: moderately difficult

Requires good soil, even moisture. Very labor intensive if you stake, prune or use plastic mulch and row covers. Easier if you purchase plants. Difficult if you start from seed.

#### Height: 2 to 6 feet

Staked and pruned plants can grow to well over 6 feet tall in favorable growing seasons.

#### Spread: 2 to 6 feet

Staked and pruned plants can be trained to narrow spreads. Plants left to sprawl can spread 6 feet or more. If space is limiting, use smaller determinate varieties.

#### Bloom time:

- mid-summer
- late summer
- early fall

#### Flower color: yellow

#### Foliage color: medium green

#### Foliage texture: medium

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**Shape:**

- spreading mass
- upright
- climbing / vine

Unstaked determinate varieties can form an upright bushy plant. Indeterminate varieties will sprawl in a mass over the ground, or can be trained into an upright vine when tied to a stake.

**Growing Information**

**How to plant:**

Propagate by seed

Germination temperature: 60 F to 95 F - Germinates best at 75 F to 90 F. Germinates very slowly at cooler temperatures.

Days to emergence: 6 to 12 - About 1 week at 75 F.

**Maintenance and care:**

If you purchase transplants, look for sturdy, short, dark green plants. Avoid plants that are tall, leggy, or yellowish, or have started flowering. Transplants that are too mature often stall after transplanting while younger, smaller plants pass them by, producing earlier and more fruit.

Starting your own plants from seed gives you more choices of which variety to grow. But if you start your own plants, be sure you have a place where they can get enough light. Even a sunny, south-facing window is barely adequate. Consider using a grow light to supplement sunlight.

Don't start plants too early. Sow seeds indoors 6 to 8 weeks before transplanting outside. Plant them 1/8 inch deep in sterile seed starting mix in flats or cells. Seeds germinate best at 75 F to 90 F. Then grow transplants at about 70 F.

Don't rush to transplant, either. Cold soil and air temperatures can stress plants. Wait at least a week or two after the last frost. Nighttime temperatures should be consistently above 45 F. Use black plastic mulch to warm soil and/or row covers, hot caps or other protection to keep plants warm early in the season. Remove covers whenever temperatures exceed 85 F.

Harden off plants before transplanting by reducing water and fertilizer, not by exposing to cold temperatures, which can stress them and stunt growth. Transplants exposed to cold temperatures (60 F to 65 F day and 50 F to 60 F night) are more prone to catfacing.

Space transplants:

- 12 to 24 inches apart for determinate varieties
- 14 to 20 inches apart for staked indeterminate varieties
- 24 to 36 inches apart for unstaked indeterminate varieties

Unlike most plants, tomatoes do better if planted deeper than they were grown in containers. Set them in the ground so that the soil level is just below the lowest leaves. Roots will form along the buried stem, establishing a stronger root system.

To reduce root disease risk, don't plant on soils that have recently grown tomatoes, potatoes, peppers or eggplant for at least two years.

Mulch plants after the soil has warmed up to maintain soil moisture and suppress weeds. Tomatoes need a consistent supply of moisture. If it rains less than 1 inch per week, water to make up the difference.

Many factors (in addition to your choice of variety) affect total yield, first harvest and fruit quality. Raised beds, black plastic mulch and providing consistent moisture by watering or through drip irrigation are good ways to improve all three.

How you provide support to plants can also affect performance. Determinate varieties do not need staking. But staking and pruning indeterminate varieties can hasten first harvest by a week or more, improve fruit quality, keep fruit cleaner, and make harvest easier. Staking and pruning usually reduces total yield, but fruits will tend to be larger. Staked and pruned plants are also more susceptible to blossom end rot and sunscald. Allowing indeterminate varieties to sprawl reduces labor, but takes up more space and plants are more prone to disease.

Wooden tomato stakes are typically about 6 feet long and 1 ½ inch square, but you can use similar materials. Drive stakes at least 8 to 10 inches deep at or soon after transplanting so as not to damage roots.

Prune tomatoes to one or two vigorous stems by snapping off “suckers” (stems growing from where leaf stems meet the main stem) when they are 2 to 4 inches long. Tie stems to stake with soft string, twine or cloth, forming a figure-8 with the stem in one loop and the stake in the other. This gives the stem room to expand without being constricted. Start about 8 to 12 inches above the ground and continue to tie at similar intervals as the plant grows. As an alternative to using individual stakes, grow several plants in a row between heavy-duty stakes or posts spaced about 4 feet apart, and use twine to weave in and out around posts and plants.

Growing tomatoes in cages is a good compromise between labor-intensive staking and just letting them sprawl. You can purchase tomato cages at your local garden center, or simply bend a 6-foot-long piece of 4- to 6-inch wire mesh into a cylinder about 22 inches in diameter. (Cattle fencing or concrete reinforcing wire mesh work well for this.) Place cage around plants soon after transplanting and anchor with stakes.

Avoid excessive N applications, which can cause excessive foliage and poor fruit set. Also avoid using fresh manure or high nitrogen fertilizers (those with three or more times nitrogen than phosphorus or potassium). Poor fruit set can also be caused by heavy rainfall or temperatures that are either too high (above 90 F) or too low (below 55 F).

On most soils, you can sidedress about 1/2 cup of 5-10-5 per plant and work shallowly into the top inch of soil when fruits are about 1 inch in diameter and again when harvest begins.

To avoid other common tomato problems:

- Keep soil evenly moist to prevent blossom end rot. This can also help prevent cracking when fruit absorbs water too fast after heavy rain following dry conditions.
- Do not remove leaves that shade fruit to prevent sunscald.

Catfacing (misshapen, deformed fruit) is caused by incomplete pollination, usually due to cold weather. Don't rush to transplant until weather has stabilized and soil is warm.

### **Pests:**

Tomato hornworms - Hand pick larvae. This pest is frequently controlled by natural enemies.

Aphids - A hard stream of water can be used to remove aphids from plants. Wash off with water occasionally as needed early in the day. Check for evidence of natural enemies such as gray-brown or bloated parasitized aphids and the presence of alligator-like larvae of lady beetles and lacewings.

Whiteflies - Do not purchase whitefly-infested transplants. Inspect carefully before purchasing.

Colorado potato beetle - Handpick and destroy beetles, eggs and larvae.

Cutworms - Control weeds. Cardboard collars around each plant give good protection.

Flea beetles - Use row covers to help protect plants from early damage. Use in place at planting and remove before temperatures get too hot. Control weeds.

### **Diseases:**

Blossom end rot - Water during drought or mulch to keep moisture level constant. Grow on soil high in organic matter. Fertilize properly. Avoid cultivating close to plants.

Catface - Grow locally recommended varieties and provide adequate fertilizer and water for vigorous growth.

Early blight, Septoria leaf spot - Locate new plants in a part of the garden different from previous year's location. If that is not possible, remove infested soil and replace with fresh soil. Avoid wetting foliage if possible. Water early in the day so aboveground plant parts will dry as quickly as possible. Avoid crowding plants. Space apart to allow air circulation. Eliminate weeds around plants and garden area to improve air circulation. Practice plant sanitation. When plants are not wet, carefully remove and destroy affected plant parts. In autumn, rake and dispose of all diseased leaves and stalks. Septoria occurs early in the season, preferring cool, wet weather. Use clean transplants and remove lower infected leaves.

Late blight - Use same cultural control strategies as above. The fungus that causes late blight has recently become a major threat to home gardens and commercial growers because of migration of new more aggressive strains (genotypes) into the United States. Verification of late blight diagnosis and implementation of prompt control measures are highly recommended. Cultural controls mentioned above may not adequately control these new strains.

Fusarium wilt - Use same cultural control strategies as above. Plant resistant varieties such as Pik-Red, Better Boy, Duke, Freedom, Supersonic, Jet Star, Springset and Floramerica.

Verticillium wilt - Use same cultural control strategies as above. Plant resistant varieties such as Supersonic, Jackpot, Basketvee, Sunny, Jet Star and Springset.

### **Varieties**

You will find hundreds of varieties to choose from in seed catalogs and at garden centers. (It's estimated that there are 25,000 to 40,000 varieties worldwide.) When choosing what to grow from seed or when purchasing plants at the garden center, consider:

**Days to harvest:** This is roughly how long after transplanting (not seed planting) you can expect first ripe fruit. Keep in mind that cool, cloudy weather will slow expected growth. Use days-to-maturity as a guide to distinguish varieties as early (65 days or less), mid-season (65 to 80 days) and late-season (80 days or more). In some cooler areas of New York, only early-season varieties can be expected to mature.

**Determinate vs. indeterminate:** Determinate varieties produce many short branches with flowers and fruit on the ends. They are usually early varieties and produce their harvest all at once. Indeterminate varieties will continue to grow and produce flowers and fruit all season until killed by frost, and are most common in gardens. Semi-determinate plants are more compact than indeterminate, but keep producing until frost.

**Use:** Some are better than others for a multitude of uses: slicing, salads, sauces, canning, juice etc.

**Appearance:** Colors range from the familiar red to orange and yellow, pink and multicolored fruits. Size and shape range from huge round beefsteaks to elongated pasters to tiny cherry and grape tomatoes and everything in between.

**Disease tolerance:** Tomatoes were originally desert plants. So they don't naturally have strong resistance to plant diseases that thrive under our generally humid conditions. Fortunately, many hybrids have been bred specifically for disease resistance, and some open-pollinated varieties tolerate certain diseases.

**Some varieties recommended for New York include:**

Cherry: Early Cherry, Fruity Orange, Sarah's Goldstar Cherry, Sungold, Supersweet 100

Grape: Jubilee

Extra Early: Cosmonaut Volkove, Currant, Daybreak, Early Cascade, Gold Rush

Early: Cascade, Early Girl, Gold Dust, Lemon Boy, Sunrise, Taxi

Main Season: Basket Vee, Better Boy, Big Beef, Big Boy, Celebrity, Jet Star, Mountain Fresh, Mountain Spring, Sunbeam, Sunrise, Supersonic, Ultra Sweet

Paste: Classica, La Roma, La Rosa, Nova, Plum Dandy, Roma, Viva Italia

Heirlooms: Big Rainbow, Black from Tula, Black Prince, Box Car Willie, Brandywine, Cherokee Purple, Golden Queen, Green Zebra, Moskvich, Mr. Stripey, Striped German, Striped Roman, Tappy's Heritage

Source: <http://www.explore.cornell.edu> 2006

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