

# Growing Garden Tomatoes

Few vegetables can inspire or disappoint gardeners more than the promise of the sweet juiciness of a vine-ripened tomato. Although tomatoes are now available year-round, the truly wonderful qualities of tomatoes are the best when they are harvested from your own garden. Tomatoes are one of the most popular of home garden crops. They require a relatively small area to grow if staked or caged, are widely adapted and many are easy to grow. In the area of food and nutrients, tomatoes are rich in vitamins C and A, plus studies on lycopene in tomatoes show many health benefits including antioxidant and cancer-preventing properties.

## Varieties

There are many excellent tomato varieties available to home gardeners, both new and old including "heirloom" varieties. Newer hybrid varieties offer better productivity, freedom from fruit splitting, heat tolerance and disease resistance. Fusarium wilt and verticillium wilt are two common problems that can be overcome by selecting wilt-resistant varieties and rotating the planting to prevent these organisms from building up in the soil. Leaf diseases such as early blight, a fungal disease, can cause substantial leaf drop. Select medium size fruiting varieties such as Celebrity, Superfantastic, Carnival, Early Girl or tycoon, plus Roma and cherry type. Avoid the large types such as Beefsteak, Big Beef, etc.

## Producing tomato plants

The quantity of transplants will influence ultimate production, so select well. The ideal tomato plant should be 5 to 7 inches tall in a 4 inch container and 8 to 12 inches tall in a one gallon container. Trans-plants should be dark green, with a stocky stem and well-developed root system. Normally, six to eight weeks are required to produce this type of plant from seeds. To get best results when only a few plants are needed, purchase them from your local nursery at the proper planting time. Check the plants quality and ask if they have been kept at the proper temperature. If a fairly large quantity of plants is needed, they can be started from seed in a good seed starting mix. Use 4 inch containers, jiffy pots or multi-cell starter trays. After seed has germinated, give them plenty of light. If kept in the house, expose them to a south window, and rotate them regularly to give uniform light. Add extra light with florescent lighting i.e. shop-light fixtures. The fixtures should be kept on for up to 16 hours per day and no more than 4 inches from the plants. Daily temperatures should be kept between 60 and 80 degrees F. Plants maybe transferred to a cold frame or set out of doors to harden off for several days prior to being placed in the garden.

## Selecting growing area

Tomatoes grow best when they receive full sun (afternoon shade around 2pm is okay). Plant them away from trees and buildings for best yield. A tomato plant requires consistent moisture, so arrange for ease of watering. Select a well-drained area, preferably raised beds, because poor soil aeration leads to root decease and problems such as blossom-end rot.

## Preparing soil for planting

Tomato plants grow well in many types of soil. Work the soil only when it is dry enough so it will not stick to tools. Improve garden soil by adding peat moss, finished compose, leaf mold, well-composted manure, coffee grounds or other organic materials. If necessary, add 2 to 3 inches of expanded shale to increase aeration and improve soil drainage. Add no sand of any kind to clay soils. Take a soil test if fertilizer and nutrient needs are unknown. Tomatoes grow best in nearly neutral soil with pH of 6.5 to 8.0. Use finished compost, coffee grounds, leaf mold and other organic soil amendments to help buffer high soil pH.

## Fertilizing

Add a complete garden fertilizer (N-P-K) at the time the soil is prepared. For bed preparation, use an organic fertilizer such as alfalfa meal, soybean meal or cottonseed meal. Apply 1 or 2 pounds per 100 square feet. Excess nitrogen prior to first fruit set can result in reduced

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flowering and fruit production. At planting time use a root stimulator solution or water-soluble fertilizer, such as 20-5-10 or fish emulsion solution and 2 to 4 tbsp of magnesium sulfate (Epsom salts) on soil surface and water in. Use a moderate amount of fertilizer until the plant sets first fruit (about 1 inch in size) and then apply 1 to 2 tbsp of water-soluble nitrogen fertilizer every 7 to 10 days over the soil area around each plant. Add 1 tbsp of Epsom salts every 6 weeks and water in.

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## Setting out plants

Set tomatoes in the garden when the weather has warmed and soil temperatures are above 60 degrees F. Tomato growth is impaired by soil temperatures below 50°. Apply a layer of black plastic to the raised beds two to three weeks prior to transplanting, in late February. In North Texas, plant tomatoes outside from March 1 to April 1 (provide protection below 45°). If the plant is in a peat pot, make sure the entire pot is covered, least the pot act as a wick and dry out the root ball. Apply 1 to 2 tablespoon of a fertilizer in the bottom of the planting hole. Also, apply 3 to 6 tablespoon of Epsom salts around the soil and water in. Guard the plant stem from cutworms with two toothpicks or a piece of drinking straw 3 inches long as a collar set into the soil around the stem. Add a quarter cup of sugar and water in as well.

## Planting distances

Proper spacing and support are essential for healthy plants and good fruit production. Distances between plants depend on the type of tomatoes (determinate, indeterminate or dwarf) and whether plants will be staked or grown in cages. Space dwarf plants 24 to 30 inches apart; staked tomatoes should be 30 to 36 inches apart if grown single stem. Allow 3 to 4 feet between staked or caged plants. Rows should be spaced 5 feet apart. Plant tomatoes in containers with sufficient container size (5 gallon minimum) to allow good root development. Container grown tomatoes need to be supported too.

## Staking and Caging

Staking allows more plants in a given area and the fruit will be larger, cleaner and easier to harvest. Staked plants also lend themselves to better insect and disease control. Use party hose for tying plants off, and allow at least 1/2 inch of slack for stem enlargement. Many gardeners prefer to support tomato plants in cylindrical wire cages. Mesh should be large enough for access to pick fruit. The best cage material is concrete reinforcing wire fabric. This method saves time required for staking, pruning and tying. Both methods will also improve air circulation around plants.

## Pruning

Plants should be staked. Remove side shoots or suckers on indeterminate varieties when 3 to 4 inches long. Don't cut suckers with a knife because this practice can spread diseases that may be present. Break out only enough shoots to allow good light and air movement through the foliage. Also, remove lower stems that touch the soil to reduce insect and disease problems and improve air circulation. A thin layer of brown peat moss will inhibit soil born fungal problems.

## Watering

Give tomatoes at least 1+ inch of water per week during March and April and 2+ inches per week there after. Keep a record of rainfall and supply the extra water needed. Soak the soil thoroughly when watering. Frequent light watering will encourage a weak root system. Plants growing in containers may need daily watering. Water plants at the soil surface to discourage early blight. Use a moisture meter.

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## Fertilizing

Fertilizer applied at the time of planting will not supply enough nutrients for the entire season. Too much nitrogen in the beginning brings heavy vegetative growth and poor fruit set. Apply fertilizer at planting time and increase the application when the first fruits are about 1 inch in size. Apply 1 pound of 4-1-2 ratio per 100 sq. ft., or approximately 1 tablespoon per plant every week or two. Mix the fertilizer carefully into the soil surface. Don't get mineral fertilizer on the foliage. Apply 1 tbsp of Epsom salts (Mg SO<sub>4</sub>) every 6 weeks and water in. (Use slow release fertilizers)

## Cultivating and controlling weeds

Many weeds are carriers of diseases that may seriously affect tomato plants when transmitted by you or insects. Weeds also compete for soil moisture and nutrients. Use mulch to reduce the need for cultivation and hand weeding. Mulch will also reduce moisture loss and build up in the soil. Use straw, pine needles, compost, landscapers mix, shredded leaves or landscape fabric/plastic. Apply organic materials in a 2 to 3 inch thick layer.

## Harvesting

Tomato color and flavor are best when daily temperature is below 85 degrees F. High temperatures soften the fruit and color and flavor is impaired. At temperatures below 50°, the ripening process is impeded and the fruit may rot. Remove fruit when the bottom of the tomato starts to show good pink color. This will reduce the incident of bird, squirrel and insect damage. Ripen fruit indoors on kitchen counter. There is no need to ripen fruit in a sunny window. Tomatoes should not be refrigerated, as the quality of the fresh flavor will be reduced. For long-term storage, canning and freezing is the best approach.

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## Plant Problems and Pests

Many of these problems are common and must be recognized early. Prevention is the most important means to keep plants healthy and productive.

### Early blight

A soil born fungal disease caused when rain or overhead watering splashes infected soil onto lower leaves of the plant. Prune up lower leaves to about 12 inches. Use plastic sheeting early in the season and an organic mulch later to reduce this problem. Also, use the spray program shown on page four.

### Flower drop.

The problem occurs when night temperatures are lower than 55 degrees F and when temperatures remain above 85° and when day temperatures are higher than 95°. Hot drying winds may exacerbate the problem. Varieties also will differ in their temperature response. Tomatoes are self-pollinating so thump flowering branches every other day to encourage good pollen release. Hand pollinate with small brush.

### Blossom-end rot

It appears as a depressed brownish spot the size of a dime or larger on the blossom end of the fruit. It is caused by a calcium deficiency combined with moisture stress. Remove the affected fruit and keep the plants well watered. Provide good soil drainage and mulch to maintain uniform moisture. Avoid cultivating (hoeing) near the roots of tomato plants. Apply Epsom salts 2 to 3 times during the growing season.

### Sunscald

High temperatures retard development of fruit color. Fruits exposed to the hot sun may scald.

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Sunscald is localized damage to the tissue often accompanied by discoloration. Shade cloth is helpful.

## **Cracking**

Variation in soil moisture increases cracking as fruit are enlarging and/or ripening. Select varieties that are crack resistant and maintain consistent soil moisture. Catfacing causes deformity on the blossom end, and is usually most common in the large-fruited beefsteak-type tomatoes.

## **Cloudy spots**

Irregular whitish spots just under the skin. This is the result of stinkbugs feeding on the fruit at some stage in its development.

## **Chemical injury**

Drift from 2, 4-D and similar chemicals commonly used on lawns may cause distorted leaves, twisted stems, dropping of flowers and fruit abnormalities. The drift may originate one-half mile or more away. Sprayers used for herbicides and then used for disease and insect control on tomatoes may also be a source of contamination.

## **Insects**

A variety of insects may attack tomatoes, although they can be controlled with a regular spray schedule. The following insects are a few that commonly attack tomatoes.

## **Cutworms**

Fat, gray, brown or black worms up to 1-1/4 inches long. They cut off plants close to the soil surface. They are most destructive early in the season. Use toothpicks or drinking straw collar as prevention.

## **Flea beetles**

Black or brown jumping bugs 1/16 inch long attack young transplants and leave them looking as though they have been shot full of small holes. Control with SunSpray™, Neem, insecticidal soap or pyrethrin.

## **Hornworms**

Large green worms up to 4 inches long eat foliage and fruit. Hand-pick or use a spray that contains Bt early in the season and often to prevent damage.

## **Leaf miners**

Larvae that make long tunnels in the leaves. Start sprays of Neem, SunSpray™ and insecticidal soap early.

## **Stink bugs**

Brown, green, or black shield-shaped bugs that give off a foul odor. They suck juices from the plant and cause hard, whitish spots under the skin of fruit. Neem, SunSpray™, and insecticidal soap are effective.

## **Spider mite**

Tiny mites are barely visible to the naked eye, fine webs may be visible under leaves. Mites suck plant juices and cause many small yellow specks, then leaves turn tan and plants can die. Forceful water sprays, insecticidal soaps, Pyola™, Neem oil, Rotenone and SunSpray™ Ultra-fine oil sprays may be used for control.

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## Diseases

Tomatoes are susceptible to early blight (*Alternaria*), Fusarium wilt, anthracnose, gray leaf spot, tobacco mosaic virus, curly top virus and *Verticillium* wilt.

Resistance to various diseases is indicated by the following letters following the plant cultivar name on labels and description.

**A** - *Alternaria* stem canker, leaf blight resistance

**F** - Fusarium wilt resistance, **FF** - Resistance to both race 1 and race 2 is indicated.

**S** - *Stemphylium* (gray leaf spot) resistance

**V** - *Verticillium* wilt resistance

**T** - Tobacco mosaic resistance

**N** - Nematode resistance

## List of Products (Alternate ingredients in spray program) Note: Do not combine oils.

**Aspirin** - *Salicylic acid*, occurs naturally within plants, use as a stress preventative. (1/2 tablet per Gal.)

**Baking soda** (sodium bicarbonate) - is a white soluble compound that suppresses fungicidal disease when used as a spray, (or use potassium bicarbonate). (1 tbsp per Gal)

**Bt** - *Bacillus thuringiensis*, is used to control caterpillars and loopers. (per label)

**Canola/Vegetable** oil is effective as an insect suffocant and has antifungal properties. (1-2 tbsp per Gal)

**Garlic** contains natural sulfur that acts as an antibacterial and antifungal agent. (do not use with oil)

**Fish emulsion** - rich in nutrients and trace minerals, use as a soil drench. (per label)

**Insecticidal soap** - made from potassium salts of fatty acids; kills insect by dehydration. (per label)

**Neem oil** - Controls insects including mites, whitefly, aphid and scale, also fungal diseases. (per label)

**Rotenone** a slow acting contact and stomach poison to insects that works on mites as well. (per label)

**Seaweed** - rich in nutrients, foliar spray, used as a stimulant and tonic. Soil drench. (per label)

**Serenade** – *Bacillus subtilis*, controls fungal disease on a wide variety of plants & vegetables. (per label)

**SunSpray™** Ultra-fine horticultural oil is used as an antifungal, suffocant and repellent. (1-2 tbsp per Gal)

**Superthrive™** as a foliar spray - is a plant stimulant and tonic. (per label)

**Soap** (dishwashing liquid - Palmolive, etc.) use as a surfactant and insecticide (can burn plant leaves).

## Soil application or drench

**Epsom salts** - *manganese sulfate*, benefits nightshade plants. Add 1/4 - 1/3 cup to the soil around plant.

**Fish emulsion** - rich in nutrients and trace minerals, use as a soil drench and mild fertilizer.

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**Sugar** - Increases microbial activity. Add 1/4 - 1/2 cup to soil around plant to reduce nematode problems.

## **Mechanical solutions**

**Reemay™** a spun row-cover material used to exclude insect pests and reduce light frost damage.

**Bird netting** - Keeps birds at bay.

**Black plastic.** - Used to raise soil temperature before and during early planting time.

## **Spraying Program**

Use Bt to kill chewing insects like the Tomato Hornworm. For aphids, spider mites Use SunSpray™ Ultra-fine, Neem oil (Canola Oil) to smother pests including spider mites. Use Baking soda and/or SunSpray™ Ultra-fine oil. Note: Always spray on shady days, in afternoon shade or in early evening. Spray under sides of leaves as well as tops. (Neem, Canola oil or very fine vegetable oil can be used in place of the ultra-fine, but spray a test area first to be safe.)

**Formula:** In a spray container (per gallon), add 2 tbsp Ultra-fine horticultural oil (kills aphids, spider mites, and inhibits fungal spores), 1 tbsp baking soda (kills early blight, black spot, powdery mildew and their spores), 1 tbsp seaweed (foliar feeds and deters insects), 3 to 5 drops of Superthrive™ (plant tonic) and 3 drops of dishwashing liquid (soap as a surfactant), 1/2 aspirin (reduces plant stress). ALWAYS read and follow label directions.

DO NOT add Garlic or anything containing sulfur to oil as this will burn the plant leaves.  
Spray frequency: every 5 to 14 days and after rainfall.

[www.dallascountymastergardeners.org](http://www.dallascountymastergardeners.org) \* \* \* <http://aggie-horticulture.tamu.edu>

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