

Tomatoes for the Home Garden



**W. M. Colt,
M. A. Swanson,
and A. M. Wilson**

Tomatoes are classified by their growth patterns into three groups. All three groups can be staked and caged.

- ✓ **Determinate:** small plants, stem growth ends with a flower cluster at 12 to 18 inches, fruit production stops when growth stops;
- ✓ **Indeterminate:** vines grow and plants bear indefinitely;
- ✓ **Semideterminate:** varieties are intermediate.

Determinate plants have fruit clusters between every node, which produces a more concentrated set of fruit. This can be a distinct advantage in short season climates. On indeterminate plants, fruit clusters are normally formed between every third node. Indeterminate plants continue to bear fruit longer in long growing seasons. When grown as staked or caged plants, tomatoes require relatively little space, yet they are capable of producing 8 to 10 pounds or more fruit per plant.

Tomato fruit may be red, yellow, orange, pink, or white. Some are striped. Fruit may be round, slightly flattened, globe, cylindrical, or pearlike. Fruit size varies between cherry and extra large, depending upon variety. Most of the extra early varieties have small- to medium-sized fruit.

Since Idaho's climate varies greatly, gardeners should select a tomato variety particularly suited to their growing conditions. Recommended varieties for the warmer areas, such as the Treasure Valley, include Big Boy, Celebrity Hybrid, Earliana, Early Girl, Peto 88, Sioux, and Superstar. In the cooler areas of Idaho, such as eastern Idaho, early determinate varieties are the best choice. Varieties such as Early Temptation, Gem State, Heinz 2653, Ida Gold, Oregon Spring, Pixie, Santa, Sub-Arctic, and Whippersnapper have proven very successful. A few of the earliest indeterminate

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Soil Preparation



varieties are also satisfactory, although not as concentrated in fruit set as determinate types. These include Early Cascade, Early Girl, First Lady, Kotlas, and Ultra Sweet. Determinate varieties also have a place in long-season areas since they are usually earlier than the long-season varieties.

There are many excellent tomato varieties to choose from. A good variety for your area and taste preference may not always be available locally as transplants, requiring you to grow your own transplants (see CIS 800 *Growing Vegetable Seedlings for Transplanting*).

Tomatoes can be grown in any well-drained, fertile soil with a pH of 5.5 to 8.0. If your soil is low in organic matter, spread 2 to 3 inches of compost, aged manure, or peat moss over the planting area, and work it into the top 4 to 6 inches of soil. Do not spade or rototill your garden when the soil is so wet that it sticks to garden tools. Start seedbed preparation when the soil is moist enough to form a mud ball that easily crumbles into medium-sized fragments. Cultivation should destroy current weed growth and provide a good seedbed for transplanting.

Soil temperatures below 50°F inhibit plant growth. The soil along the south side of a building is warmed by reflected sunlight in the spring; consider such a location, if available, for growing tomatoes. Use black plastic to help warm the soil while preventing weed growth and maintaining good surface moisture. If you don't use black plastic film, applying a bark or straw mulch later in the season will help discourage weed growth, conserve moisture, and maintain an even soil temperature. However, since mulches provide insulation, do not apply them until late June or July when the soil has become warm.

Fertilizer

Soil tests are the best indicators of fertilizer needs. In the absence of a soil test, apply a preplanting fertilizer of 0.1 pound nitrogen for each 100 square feet. Be sure to work fertilizer well into the soil to reduce the chance of burning. Excessive nitrogen, whether from organic or inorganic sources, tends to produce plants with large stems and leaves, and only a few tomatoes that are delayed in maturity. If you have worked in organic matter, such as leaves, compost, or well-rotted manure, and your garden soil has good tilth, you do not need to apply fertilizer except perhaps a starter solution in the



Table 1. Tomato varieties evaluated at the Aberdeen Research and Extension Center.

Variety	Avg. date mature	Avg. size fruit (oz)	Total produce per plant (oz)
Latah	July 24	1.1	46.4
Rocket	July 24	1.8	33.6
Early Salad	July 31	0.7	171.2
Pixie	Aug. 1	1.6	25.6
Sandpoint	Aug. 1	0.1	125.4
Sub-Arctic Maxi	Aug. 5	0.9	07.2
Benewah	Aug. 6	1.0	40.0
Early Girl	Aug. 9	3.3	220.8
Starfire	Aug. 14	3.9	51.2
Kootenai	Aug. 18	1.2	25.6
Rushmore	Aug. 18	4.0	33.6
Earliana	Aug. 19	4.0	148.8
Floriana	Aug. 22	3.0	84.8
Supersteak	Sept. 12	8.5	22.4

Planting Suggestions

transplanting hole before setting in the plant. The starter solutions may be made using ½ ounce of diammonium phosphate or 1 ounce monoammonium phosphate per gallon of water.

Purchased transplants should be 4- to 6-inches tall, have a stem the size of a pencil with a slight purpling at the base of the stem, and have dark green, thick, and turgid foliage. Start homegrown transplants 5 to 7 weeks before planting outside; harden off all plants by placing them outside for a few days before transplanting. On the first day of the hardening process, take the plants outside for a few hours and place them where they'll be protected from direct sunlight and wind. Each day, lengthen this time outside a little, gradually exposing them to more sun and wind.

Transplants should not have flowers or fruit on them when you plant them out. As a rule of thumb, plant your transplants 10 days after the last expected killing frost. Using hot caps, 1-gallon plastic bottles with the bottom cut out, floating row covers, Wall-of-Water, or other protective devices may allow an earlier transplanting date. If you use such frost protection devices, lay black plastic over the planting area 3 to 4 weeks before transplanting to warm the soil.

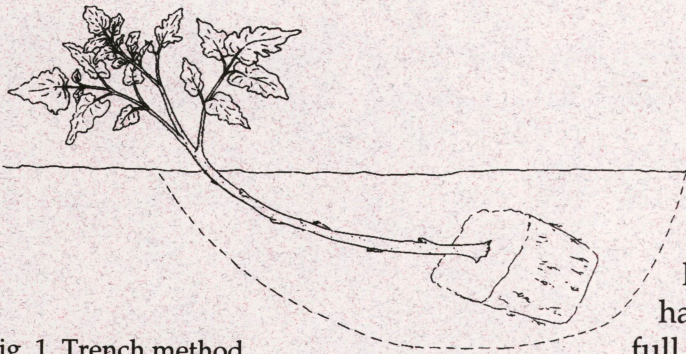


Fig. 1. Trench method.

Transplants grown in individual peat or plastic pots or cell type plastic trays can be transplanted with the least amount of shock and root system disturbance, and will become established more quickly than group pots or flats. If the roots must be disturbed during transplanting, transplant in the late afternoon so that the plants will have a night to recover before enduring a full day of sunlight.

You can plant tall, spindly transplants using a trench method; strip leaves from all but the top few inches of the plant and lay plant sideways in a 3-inch deep trench (fig. 1). Additional, *adventitious roots* will form along the buried stem. Space tomato plants between 24 and 36 inches along the row, and about 36- to 60-inches wide.

Transplants planted in open areas should have some protection from the wind while getting established. Driving a wooden shingle into the ground on the windward side can be effective. Remove it in a week or two. You also may place transplants in the center of used tires for wind protection and to benefit from additional heat absorbed by the tire.

Unfavorable temperatures for pollination will frequently cause early tomato blossoms to drop off healthy plants, causing little or no early fruit production. Tomato set will not occur on most varieties when night temperatures are below 55°F or when day temperatures are above 90°F. Fortunately, most short-season varieties are not as susceptible to temperature-caused blossom drop.

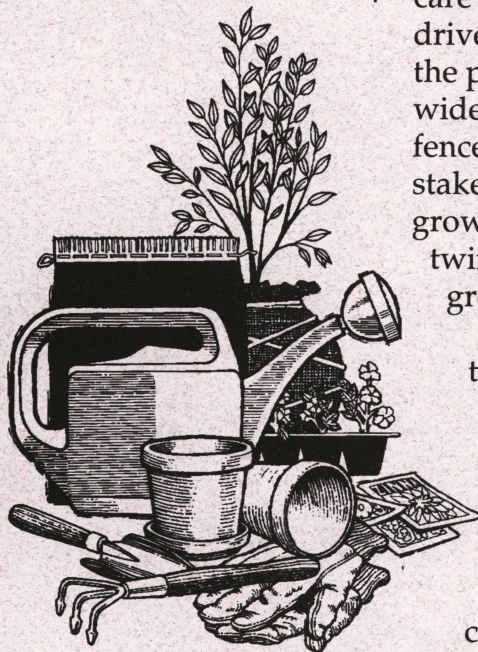
A sudden hot spell can interfere with fruit set for about a week after temperatures return to normal; all you can do is wait. Poor soil fertility, excessive use of nitrogen fertilizer, or keeping soil too wet or too dry are other reasons blossoms fail to set. Since too much shade can also cause the problem, be sure to plant tomatoes in full sunlight or at least where they receive more than 4 hours of sunlight daily.

Water tomato plants slowly and completely to help develop a strong root system. Do not let tomatoes wilt, or yields and fruit quality will be reduced. Cold soil temperatures, uneven soil moisture, and excessive watering can cause blossom-end rot to develop. This

Blossom Drop of Tomatoes

Watering

Care During the Season



Insects

nonparasitic disease appears first as a water-soaked area at the bloom end of the tomato fruit, the end opposite the stem. This area eventually becomes a blackened, dry spot. (For further information about this malady, see CIS 292 *Blossom-End Rot of Tomatoes*.)

For highest yields, mulch tomato plants with a 2- to 3-inch layer of organic material, such as compost or straw, around the growing plants. Mulching helps prevent water loss from the soil.

You can let tomato plants grow on the ground, or support them by staking or caging. Unstaked plants ripen fruit a week or two earlier. Staking minimizes care and reduces fruit rots. Soon after transplanting, drive stakes 1 foot into the soil, about 4 to 6 inches from the plant. Use wooden stakes 6-foot long and 1½-inches wide. For more permanent stakes use 4-foot long steel fence posts at 5-foot intervals. Attach heavy twine to the stakes at 10-inch vertical intervals. As the tomatoes grow, pull them to the stakes and tie loosely or weave twine between stakes, trapping tomatoes as they grow.

You can also set tomato plants along a fence or trellis or place them in wire cages. Using wire cages is more expensive but requires less time for pruning and staking. You can buy cages at most garden stores or make your own using a piece of concrete reinforcement wire 5-foot tall and 6-foot wide.

Prune staked, indeterminate (vining) tomatoes cultivars 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. Pinch off other shoots, called *suckers*, weekly. In wire cages, prune only once, in early summer, leaving only three to four main stems. Do not prune determinate varieties because it will stop growth and reduce fruit production.

To control weeds, cultivate or hoe around the plants. However, only work the soil deep enough to kill weeds without damaging plant roots. Black plastic mulch will prevent most weed growth.

Each of these insects may be a problem for tomato plants: green peach aphid, garden symphylan, flea beetles, spider mites, wireworms, and tomato horn-

worms. Discourage cutworms by placing a collar, such as a tin can with the top and bottom removed, around each plant. (For further information, see CIS 226 *Garden Vegetable Insect Control* or the Pacific Northwest Insect Control Handbook, revised annually.)

Diseases

Diseases include: anthracnose, aster yellows, bacterial canker, bloom-end rot, curly top, early blight, fruit rots, leaf mold mosaic, root-knot nematode, streak and wilt and tobacco mosaic virus. (For further information, see Pacific Northwest Disease Control Handbook, also revised yearly.)

Harvesting

For best flavor, harvest fruits when they are fully ripe and firm. Tomatoes will ripen to high quality indoors if picked when the red color first shows. As the season draws to a close, green tomatoes still on the vine may be protected with little effort by a temporary plastic greenhouse. Support plastic so it doesn't contact the foliage, and ventilate to prevent excessive heat buildup during the day. Blankets or quilts can protect plants from overnight frosts. Harvest and wrap green fruit in newspaper, storing it at 55 to 60°F. Unwrap the fruit as needed and place it in the windowsill to ripen at room temperature. Whole plants can also be pulled and hung upside down in a frost-free place. Pick tomatoes as needed.

Canning Tomatoes and Tomato Products

Canning tomatoes and tomato products is an excellent way to preserve them for year-round enjoyment.

When canning tomatoes and tomato products, use safe, scientifically determined procedures. Heat processing used in canning destroys the microorganisms that cause spoilage (molds, yeast, bacteria). Several factors influence the time and temperature required:

- √ Composition of tomatoes (acidity, solids content),
- √ Composition of other vegetables or meats added (acidity),
- √ Style of tomato preparation (crushed, whole, or halved),
- √ Type of liquid added to tomatoes (juice, water, none),
- √ Consistency of tomato product (thick, thin),
- √ Initial temperature (hot or raw packed),
- √ Type of jar (size, shape).

Processing times are scientifically determined. Only follow a tested recipe for canning tomatoes and tomato products, such as salsa. Changing the amount or type of

ingredients and preparation method can influence the processing conditions needed to guarantee safety. For example, adding extra vegetables to a salsa recipe can change acidity and overcooking can change consistency. *Products not prepared according to instructions should be frozen.*



Over the years, tomato canning recommendations have changed as a result of new research findings. In 1987, the U.S. Department of Agriculture (USDA) completed extensive testing of tomato canning procedures. Based on this research, the USDA has made several changes to ensure that home-canned tomatoes and tomato products will be safe to eat and can be stored on the shelf without spoiling.

When you can tomatoes, choose only firm underripe to ripe produce. Do not can overripe tomatoes or those with bruises, spots, decay, mold, cracks, or growths. Wash tomatoes in cool running water. Dip tomatoes in boiling water for 30 seconds or until skins start to crack. Dip in cold water then slip off skins and remove cores and any green spots. You can use the *hot pack* canning method or the *raw pack* method for tomatoes and process in a boiling water canner or a pressure canner.

Add acid to your jars of whole, crushed, or juiced tomatoes before processing. Adding acid is an extra protection against spoiling.

You need to add acid when using either a boiling water canner or a pressure canner. If you wish, you may add a small amount of sugar to mask any sour flavor.

Acid Ratios

Bottled lemon juice: 1 tbsp/pint; 1 tbsp/quart
Citric acid USP: ¼ tsp/pint; ¼ tsp/quart
Sugar: 1 tsp/pint; 2 tsp/quart

Salt adds flavor to tomatoes, it does not preserve them. Therefore, you may omit it. If you use salt, add ½ teaspoon to each pint jar, 1 teaspoon to each quart jar.

One popular home canned product is crushed tomatoes. Crushed tomatoes are packed hot without any added liquid. Follow the directions precisely to ensure safe, high-quality canned tomatoes.

Cut peeled tomatoes into quarters, trimming off any bruised or discolored portions. Heat one-sixth of a canner load quickly in a large pot, crushing tomatoes with a wooden spoon as they are added to press out

juice. (Continue heating to boiling, stirring to prevent burning.) Gradually add remaining quartered tomatoes, stirring constantly. (Crushing is not necessary.) Boil gently 5 minutes after adding all tomatoes. Fill jars immediately with hot tomatoes leaving $\frac{1}{2}$ -inch headspace. Add acid and salt, if desired.

Adjust lids and process in a boiling water canner or pressure canner.

At altitudes less than 1,000 feet:

- ✓ Process pints for 35 minutes and quarts for 45 minutes in a boiling water canner.
- ✓ Process both pints and quarts for 15 minutes in a pressure canner using 10 pound pressure for a weighed gauge and 11 pound for a dial gauge.

For altitude adjustments or information on canning other types of tomatoes or tomato products, refer to PNW 300 *Canning Tomatoes and Tomato Products* (available in Spanish) and PNW 395 *Salsa Recipes for Canning* (also available in Spanish) or contact your local Extension office.

To order these or other University of Idaho publications, contact the University of Idaho Extension agent in your county, or write to Ag Publications, University of Idaho, Moscow, Idaho, 83844-2240, or call (208) 885-7982.

PNW 300 Canning Tomatoes and Tomato Products (25¢)
(WREP 112 for a Spanish version)

PNW 395 Salsa Recipes for Canning (\$1)
(PNW 395s for a Spanish version)

CIS 292 Blossom-End Rot of Tomatoes (25¢)

CIS 226 Garden Vegetable Insect Control (45¢)

CIS 800 Growing Vegetable Seedlings for Transplanting (35¢)

EXT 726 Weed Control in the Home Garden (35¢)

Pacific Northwest Insect Control Handbook (\$19.50)

To order the following or other publications, contact Agricultural Communications, Publication Orders, Oregon State University, Corvallis, Oregon, 97331-2119, or call (503) 737-2513.

Pacific Northwest Plant Disease Control Handbook (\$19.50)

The authors—W. Michael Colt, Extension horticulturist, Parma Research and Extension Center; Marilyn A. Swanson, Extension food safety specialist, Department of Family and Consumer Sciences, University of Idaho, Moscow; Alan M. Wilson, horticulturist, Ricks College, Rexburg.

Illustration on page 4
by Lorraine Ashland.

CORRECTION

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Acid ratios on page 7 are incorrect. The correct ratios are

Bottled lemon juice: 1 tbsp per pint; 2 tbsp per quart

Citric acid USP: 1/4 tsp per pint; 1/2 tsp per quart

