Horticulture

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Revised April 2020 Garden/2004-05pr

Tomatoes in the Garden

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Summary

Tomatoes grow best in sunny locations and in fertile, well drained soils. Incorporate organic matter and a complete fertilizer into the area before planting. Side dress with additional nitrogen fertilizer later in the season to help grow a large vine. Plant tomato seeds directly in the garden 10-14 days before the last frost date. In Utah, most gardeners transplant tomatoes through black plastic for earlier maturity. Use row covers or hot caps to protect the plants when transplanting before the frost-free period. Irrigation should be deep and infrequent. Plastic and organic mulches also help conserve water and reduce weeding, however, do not apply organic mulches until soils have warmed to 75°F. Control insect and diseases throughout the year. Harvest tomatoes when the fruits are fully colored but still firm. At the end of the season, gather all mature green and slightly colored fruits and store at 55°F. There are more than 4,000 tomato varieties worldwide so select varieties based on use, fruit size, earliness, soluble solids, growth habit or disease resistance. Many varieties are hybrids but heirloom tomatoes are becoming very popular. Consult with your local nursery or garden center, seed salesman or any seed catalog for detailed information on characteristics of each variety.

Varieties

Tomatoes can be categorized by maturity class (early, midseason or late), fruit size (cherry, pear, plum or large), plant size (determinate, semi-determinate or indeterminate), fruit color (red, pink, yellow, orange), or use (fresh, process or dual use). When selecting varieties, consider your growing environment, primary use, and how much space is available to grow the plants. Since the growing season in Utah is short, it is best to grown determinate or semi-determine types as they have a more concentrated fruit set and maturity. However, all varieties will grow in Utah but not all are available or suitable. Most garden centers and nurseries carry varieties that have been proven to grow well and produce high quality, flavorful fruits for local conditions.

How to Grow

Soil: Tomatoes need well-drained soil and do poorly in heavy, wet soils. If planting in an area that does not drain well, it is advised to plant in a raised bed.

Soil Preparation: Choose a site in your garden that receives full sun. Before planting, determine fertilizer needs with a soil test and then follow the recommendations given with the test report. If fertilizer applications are warranted, work the fertilizer into the top 6 inches of soil. If you fertilize with compost, apply no more than 1 inch of well-composted organic matter per 100 square feet of garden area.

Plants: Allow 6-8 weeks to grow transplants. Transplants should have 5-7 leaves and a well-developed root system before planting. Germinate seeds at 80°F until the seed root emerges, then transfer seeds to sterile seeding mix and grow out at 65-70°F. Adequate light is essential to produce quality transplants. Cool fluorescent tubes placed 2-3 inches above the plants, lit for 14-16 hours per day will ensure plants grow big and healthy. Water regularly and feed weekly with a half strength soluble complete fertilizer before planting into the garden. Transplants mature about 4 weeks before seeded tomatoes and are recommended for most areas of Utah.

Planting and Spacing: Tomatoes should be transplanted when soils are warmer than 60°F or after all frost danger has past. Seed can be planted two weeks before the last frost. Plant 4-6 seeds ½ inch deep, and 18 inches apart in the row. After seedlings have two leaves, thin to 1-2 plants per clump. Transplants should be planted 2 feet apart in row, with rows 2-3 feet apart. Transplants that are stocky, dark green, have 5-7 leaves and are 6-10 inches tall grow most rapidly. Transplants with flowers or fruits establish slowly and yield poorly so re remove them before planting. If plants are quite tall, they can be planted deeper as tomatoes form roots from their stems.

Mulch: Black plastic mulch warms the soil, conserves water and helps control weeds. Plastic mulches allow earlier planting and maturity, especially with transplants. After laying out the mulch, secure the edges with soil and cut holes for seeds or transplants. To avoid heat injury to the transplant, the stem should not touch the plastic mulch. When using plastic mulches and row covers, seeds or plants can be set out several weeks before the last frost date. Do not apply organic mulches (grass clippings, straw, newspapers etc.) until soils are warmer than 75°F. Both plastic and organic mulches help conserve water and control weeds.

Row Covers: Row covers enhance growth and earliness. Hotcaps, plastic tunnels, fabric covers, and other devices help protect seedlings and transplants from cool air temperatures. Plants grown under row covers require ventilation when air temperatures exceed 80°F. Tomato flowers are sensitive to high temperatures during flower development and early fruit set. Fruits abort if temperatures exceed 90°F, so use a thermometer to help determine the temperature under the row covers. Remove covers when weather has stabilized.

Irrigation: Water tomatoes deeply and infrequently, applying 1-2 inches per week. Use drip irrigation if possible. Mulch around the plants will help conserve soil moisture and reduce weed growth. Irrigate so that water goes deeply into the soil. Irregular watering (over or under) can cause blossom-end rot, a dark leathery spot on the bottom of the fruit.

Fertilizer: Avoid over-fertilizing tomatoes which causes excess leaf growth and delays fruit set and maturity. Side dress each plant with 1/2 tablespoon of (21-0-0) fertilizer, sprinkled around the plants at 4 and 8 weeks after transplanting, then water in the fertilizer.

Trellis: Wooden stakes or wire cages are regularly used to support tomatoes and keep ripening fruits off the ground. Stakes should be driven 18 inches in the soil, 3-4 inches from the stem. Semi- and indeterminate varieties require more support and vine pruning to keep plant size manageable. Continue to tie up plants as they grow. Determinate vine types are generally grown on the ground.

Problems

Weeds: Plastic and organic mulches (straw, leaves and grass clippings) effectively control weeds. Healthy vigorous plants outcompete weeds, once they are established. Cultivate shallowly to avoid root damage if weeds are a problem. Volunteer tomatoes plants may create a weed issue in future years if fruit is not removed from the garden.

Insects and Diseases: For more detailed information on insect and diseases visit the Utah Pests website (www.utahpests.usu.edu).

Insect	**Identification**	**Control**
Aphids	Green or black soft-bodied insects that feed on underside of leaves. Leaves become crinkled and curled. May transmit virus diseases. Secreted honeydew makes plants appear shiny, wet or sticky.	Use insecticidal soaps or strong water stream to dislodge insects.
Flea Beetles	Small black beetles that feed on seedlings. Adults chew tiny holes in cotyledons and leaves. Beetles can reduce plant vigor or may kill seedlings.	Control beetles with insecticide dust at seeding or transplanting.
Hornworms and Fruit worms	Larvae feed on leaves and fruits causing defoliation and fruit damage. Look for bare areas and black fecal matter.	Hand removal is an easy control method. Use Bt or other insecticides for heavy infestations.
Disease	**Symptom**	**Control**
Leaf Blights or Spots	Dark spots on stem, leaves or fruits. The diseases eventually spread to all plant parts. The foliage eventually dies, exposing fruits to the sun, which causes premature ripening.	Leaf diseases are promoted by cool, wet conditions. Avoid overhead irrigate late in the day; let soil dry between watering. Apply appropriate fungicide once disease identified.
Wilt Diseases	Leaves wilt on one or more vines. Plants often die. Streaking, slime formation, or gummy exudates visible on or in stems. Diseases are caused by different pathogens.	Identify causal disease. Plant resistant varieties that have V, F or N designated in their name.
Viruses	Leaves are light green, mottled, malformed, dwarfed and curled. Early infection affects fruit shape and flavor. Viruses can be transmitted by aphids and leafhoppers, brushing against infected plants, or from tobacco products.	Control aphids. Destroy infected plants and weeds. Don't use tobacco products when handling plants.
Fruit Disorders	**Symptoms**	**Control**
Blossom-end rot	Blossom-end-rot (BER) is caused by a localized calcium deficiency brought on by poor water management, excessive nitrogen, root pruning, and drought stress. Affected fruits become dry, brown or black on the flower end.	Good water and nutrient management reduces BER. Maintain uniform soil moisture during hot weather particularly when plants are flowering. Mulch around plants.
Cat-facing	Cat-facing is associated with cold weather during fruit set. Fruits develop a long scar at the blossom end and fruits can be misshapen and rough.	Early plantings often have cat-faced fruits on early trusses. As temperatures warm, fewer fruits show the disorder.
Sunscald	Sunscald is caused when fruits are exposed to direct sunlight during hot, dry weather. Sun exposed areas over-heat, dry out, and do not color uniformly.	Better water and nutrient management can reduce sunscald since plants have good leaf cover. Support structures, shading, moist soils and more moderate weather helps reduce these disorders.

Harvest and Storage

Tomato fruits requires 25-35 days to mature from flowering, depending on the temperature and variety. Pick fruit when they are fully colored but firm, for the best flavor and quality. Pick fruits as they ripen. At the end of the season, harvest all fruits that are mature, green or colored slightly. Store at 55°F and use as they ripen. Individual fruits do not need to be wrapped. Ripe tomatoes will store for 1-2 weeks if held at 50-55°F. Fruits are subject to chilling injury so do not store for long periods in the refrigerator.

Productivity

Plant 2-3 tomato plants per person for fresh use and an additional 5-10 plants for juicing, canning or freezing. Expect 100 pounds of fruit per 100 feet of row.

Nutrition

Tomatoes are very nutritious and low in calories. One medium fruit has about 35 calories, is low in fat and is an excellent source of vitamins A and C.

Frequently Asked Questions

What causes the flowers to drop off or not set fruit my tomato plants? During unfavorable weather (night temperatures lower than 50°F, or day temperatures above 95°F), tomatoes do not set and flowers abort. The problem usually disappears as the weather improves.

What can I do to prevent my tomatoes from cracking? Some varieties are more prone to cracking than others. Many of the newer hybrid varieties are quite resistant. Severe root or vine pruning increases cracking. Keep soil moisture uniform as the tomatoes develop, and plant resistant varieties to minimize this problem.

I sometimes see small, cloudy white spots just under the skin of my tomatoes. What causes this? These spots on green or ripe fruits are caused by stink bug feeding.

Why are the new leaves on my tomato pointed, cupped, twisted, and irregular in shape? It's likely your tomatoes have been injured by 2,4-D or a similar growth regulator weed killer. Never use the same sprayer in your vegetable garden that you use for weed control in your lawn. Use caution when applying lawn care chemicals near vegetable or fruit plantings. If applying grass clippings to the garden, make sure the herbicides used are safe for food plants. Consult with your lawn care professional to ensure the chemicals applied to your lawn will not affect your edible garden plants.

On some of my tomato plants, the leaves are turning yellow and the plants are no longer growing. Also, the fruits are ripening prematurely, and are leathery and bitter. What is wrong? Tomatoes with these symptoms are infected with the curly top virus, a disease transmitted by the beet leaf hopper. Once infected, there is no known control so it is best to destroy infected plants. The severity of curly top varies from year to year, so planting a few more plants than required will compensate for potential losses. In high risk areas plant Roza, Columbia, Rowpac, or Saladmaster varieties which are more tolerant to curly top.

This project is funded in part by USDA-Risk Management Agency and the Utah Department of Agriculture and Foods Specialty Crops Block Grant (SCBG 161039) under a cooperative agreement. The information reflects the views of the author(s) and not USDA-RMA or UDAF.