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Sustainable Gardening for School and Home Gardens: Tomato

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SUSTAINABLE GARDENING

FOR SCHOOL AND HOME GARDENS

Tomato

Solanum lycopersicum

QUICK FACTS

- **Plant family:** *Solanaceae* (Nightshades)
- **Season:** Warm
- **Life cycle:** Annual
- **Transplant to first harvest:** 60-85 days

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THE LOUISIANA FARM TO SCHOOL PROGRAM

Create a Sustainable Garden by improving soil health, relying on locally available materials and resources, and practicing environmentally sound horticultural practices

History

Tomatoes belong to the *Solanaceae* family, also known as nightshades, which includes the Irish potato, pepper, tomatillo and eggplant (Figure 1).

The first wild tomato plant had bright red, cherry-type fruit and is thought to be native to the Andes Mountains region of Peru and Bolivia. Tomatoes spread to South America and Central America by the natural migration of Indigenous peoples. Confined to the Americas for several thousand years, tomatoes were bred and selected for larger fruit that varied greatly in appearance. The plants were likely bred in Mexico beginning with the Aztecs and Toltecs. There it was traditionally companion planted with corn.

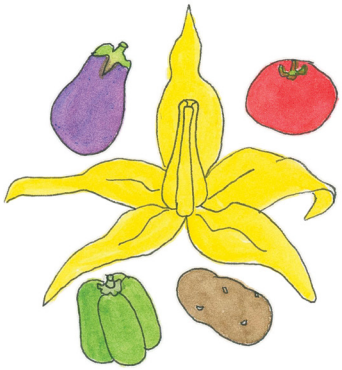

Figure 1. Tomatoes belong to the* Solanaceae *plant family, along with Irish potatoes, peppers, tomatillos, eggplants and many more.

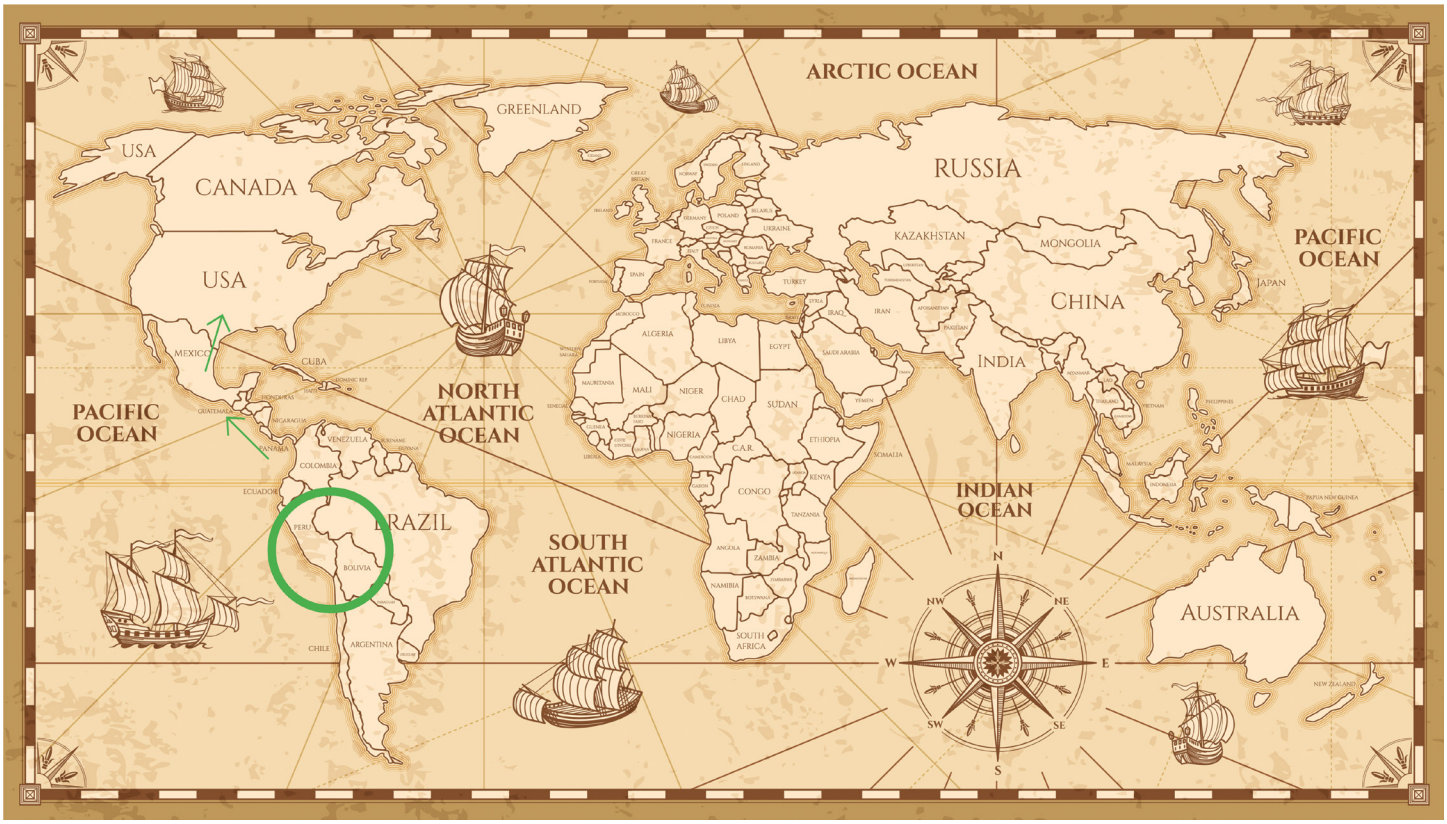

Figure 2. Map showing the origin and migration of tomatoes to the U.S.

Christopher Columbus' arrival in the New World prompted the spread of the tomato plant to Europe via Spanish explorers by 1550. In Spain the tomato was called "pome dei Moro," or "Moorish apple." In Italy it was called "pomo d'oro," or "golden apple," and in France it was named "pomo d'amore," or "apple of love." Development of new varieties continued across those European countries and was centralized around the Mediterranean region. English-speaking countries were skeptical of the fruit, as the tomato is in the deadly nightshade family and the red color was thought to signify its poisonous nature. Tomato leaves and immature fruit contain the toxic alkaloid tomatine.

By the 1700s tomato plants were grown in the U.S. by many gardeners, even Thomas Jefferson himself, but still the poisonous myth lingered. This cultural opposition began to change by 1812 with help

from Creole cuisine in New Orleans, as tomatoes were fundamental for many dishes like gumbo and jambalaya. By the mid-1800s, tomatoes were commonly grown and used across the U.S.

In the 19th century, the tomato had to overcome another myth that it caused cancer. This was eventually disproved by scientific evidence; it actually contains high levels of lycopene, an antioxidant that has cancer-fighting properties. This antioxidant is also found at lower levels in watermelon and grapefruit.

Today, tomatoes are the most commonly grown crop in a home garden, and each American eats a yearly average of 23 pounds of processed tomatoes (ketchup, tomato sauce, etc.). Although the tomato is botanically a fruit, it is treated and classified as a vegetable.

Growing

Varieties

Tomato varieties are grouped by plant growth habit: determinate or indeterminate (indicated in Table 1 with a "D" or "I" after the variety name). Determinate varieties (sometimes called bush types) generally produce fruit during a shorter harvest period (3-4 weeks), as stem growth stops at a "determined" height with a terminal (final) bud. In contrast, indeterminate varieties have a stem that continues to grow "indeterminately" until the frost, producing fruit progressively over a longer harvest period (5-6 weeks).

Determinate varieties often grow 3-4 feet in height, and indeterminate varieties grow 6-7 feet in height. Indeterminate varieties must be grown on a tall, strong trellis.

The thousands of tomato varieties can be divided into the following types: (1) fresh market and beefsteak, (2) heirloom, (3) Roma/paste, (4) grape and cocktail, or (5) cherry (see Figure 3). Tomato fruits ripen to a variety of colors from the traditional bright red to yellow, orange, pink, green or purple. Some varieties are selected for superior flavor or sweet-tasting fruit, heat tolerance (heat-set), uniformity, productivity or disease resistance.

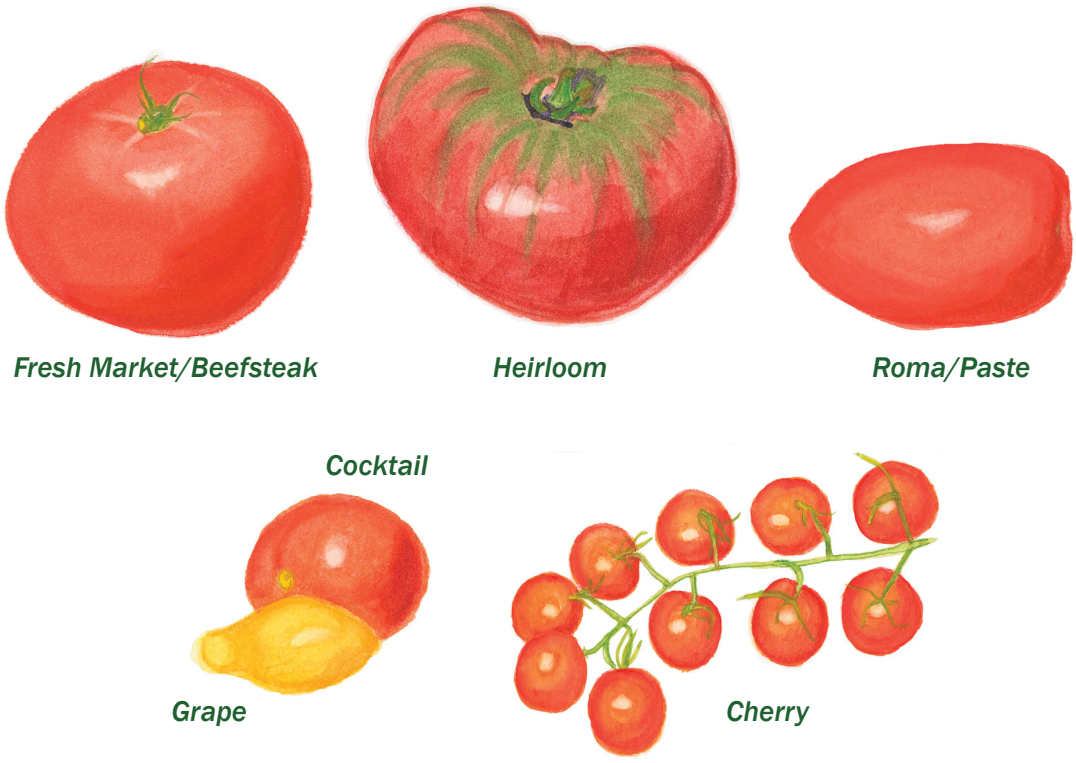

Figure 3. Main types of tomatoes are fresh market/beefsteak, heirloom, Roma/paste, grape and cocktail, and cherry.

Fresh market or beefsteak types produce more traditional, large, bright red, round tomatoes that are sometimes called "slicers" as they are used sliced on sandwiches and salads. Pink Girl and Carolina Gold are two fresh market/beefsteak varieties recommended for Louisiana that do not have red flesh. This type includes varieties with high disease resistance and average fruit weight.

Heirloom tomatoes are generally indeterminate, requiring trellising and pruning to manage the plants properly. Most varieties have little disease resistance and the fruit are usually thin-skinned and soft and tend to crack. Heirloom tomatoes are attractive because many varieties are very flavorful, colorful and available in many sizes and shapes. They also have interesting names. Greater care and management are required for heirloom types and, if being grown organically, should be grown in high tunnels for greatest chance of success. There are hundreds of varieties of heirloom tomatoes available. Heirloom tomatoes include varieties whose seeds have been saved for at least 50 years and can be saved each season and replanted. In Table 1, varieties are grouped under heirloom even if they could have been categorized under another type based on size and shape. For example, popular heirloom varieties like Brandywine, Carbon and Cherokee Purple are also larger and good for slicing like fresh market/beefsteak types. San Marzano is a famous Italian heirloom that is also used in the same way as other Roma or paste tomato varieties, and Yellow Pear is also a cherry tomato type, but all of these are listed under heirloom.

Roma/paste tomato types include varieties with rather uniform, plum-shaped, medium red fruits averaging 3-5 ounces. Varieties in this type have thick walls, few seeds and good flavor. They are ideal for tomato sauce, paste, puree, ketchup, juice and canning. All the Roma/paste types recommended for Louisiana are determinate varieties, and they are traditionally harvested in bulk, all at one time, and preserved.

Grape, cocktail and cherry types are faster-growing and produce smaller fruit that vary in color (red, yellow, orange, purple-black) and weigh between 1/2-2 ounces. These types are generally very sweet-tasting and productive, with varying disease resistance. Grape and cocktail tomatoes include varieties that produce fruit at the higher end of the weight range and often have a more elongated shape. Sungold is a variety of cherry tomato that holds the title for the sweetest fruit, making them very popular among children.

Tomatoes have either open-pollinated (including heirloom) or hybrid varieties. All tomato varieties produce perfect, self-pollinating flowers (containing both male and female parts, see Figure 4), so there is usually no need to isolate different varieties when planting in order to save seed. For older varieties (heirlooms), it is recommended to separate different varieties by a distance of 10-50 feet to prevent cross-pollination (this difference is due to the flower structure of older tomato varieties).

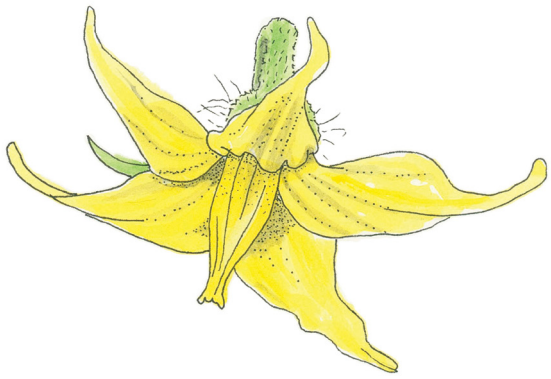

Figure 4. A tomato flower is self-pollinating.

If growing tomatoes in a greenhouse, it is recommended to select a greenhouse variety (indicated in Table 1). These varieties have been bred specifically for greenhouse conditions — lower light, higher humidity and high temperature — and have better disease resistance than field types. Nearly all greenhouse varieties are indeterminate hybrids so that they will produce over a long harvest season. While non-greenhouse types would also grow in the greenhouse, the yield and quality would be reduced. In controlled environments (greenhouse or high tunnels), blowing/shaking of flowers or using bumble bees is required to ensure adequate pollination.

It is recommended to select disease-resistant varieties whenever possible. See the recommended tomato varieties for Louisiana in Table 1.

Table 1. Recommended Tomato Varieties for Louisiana

Variety Name & Type[a]	Description	Days to Harvest[b]	Fruit Weight	Resistance
Fresh Market or Beefsteak				
Amelia (D)	Large, uniform, red fruit; good for slicing; flavorful and firm; productive; crack resistant; hybrid	75 days	8-12 oz.	Fusarium wilt, root-knot nematode, Stemphylium gray leaf spot, tomato spotted wilt virus, Verticillium wilt
Beefmaster (I)	Bright red fruit; very productive; high quality; sweet and flavorful; meaty; good for slicing; crack resistant; hybrid	80 days	16-32 oz.	Anthracnose, Fusarium wilt, root-knot nematode, Stemphylium gray leaf spot, tomato spotted wilt virus, Verticillium wilt
Bella Rosa (D)	Round, bright red fruit; flavorful; good for slicing; productive; heat tolerant; hybrid	75 days	9-12 oz.	Alternaria stem canker, anthracnose, Fusarium wilt, root-knot nematode, Stemphylium gray leaf spot, tomato spotted wilt virus, Verticillium wilt
Better Boy (I)	Bright red fruit; very productive; meaty; good for slicing; flavorful; good foliage; hybrid	75 days	10-16 oz.	Anthracnose, Fusarium wilt, late blight, root-knot nematode, Stemphylium gray leaf spot, Verticillium wilt
BHN 444 (D)	Bright red fruit; productive; good for slicing; grows well in Southern states; hybrid	75 days	12 oz.	Fusarium wilt, Stemphylium gray leaf spot, tobacco mosaic virus, tomato spotted wilt virus, Verticillium wilt
BHN 602 (D)	Bright red fruit; flavorful; good for slicing; grows well in the South; productive; hybrid	75 days	10-12 oz.	Fusarium wilt, tomato spotted wilt virus, Verticillium wilt
Big Beef (I)	Large, round red fruit; flavorful, early variety; crack resistant and heat tolerant; popular variety for this type; hybrid	70-73 days	10-16 oz.	Alternaria stem canker, anthracnose, Fusarium wilt, late blight, root-knot nematode, Stemphylium gray leaf spot, tobacco mosaic virus, tomato mosaic virus, Verticillium wilt
Big Dena (I)	Large reddfruit; mostly smooth with slightly ribbed shoulders, flavorful, uniform; good greenhouse hybrid	77 days	8-12 oz.	Fusarium wilt, Fusarium crown root rot, leaf mold, tobacco mosaic virus, tomato mosaic virus, Verticillium wilt
Carolina Gold (D)	Golden-yellow fruit; firm; meaty; flavorful; low acidity; productive; hybrid	75 days	8-10 oz.	Fusarium wilt, gray wall, Stemphylium gray leaf spot, Verticillium wilt
Celebrity (D)	Round, medium, bright red fruit; flavorful; firm; productive, early variety; crack resistant; hybrid	70-72 days	7-8 oz.	Alternaria stem canker, anthracnose, Fusarium wilt, root-knot nematode, Stemphylium gray leaf spot, Tomato mosaic virus, Verticillium wilt

Variety Name & Type[a]	Description	Days to Harvest[b]	Fruit Weight	Resistance
Champion (I)	Red fruit; early variety; productive; good for slicing; heat tolerant; hybrid	65 days	6-8 oz.	Anthracnose, Fusarium wilt, root-knot nematode, tobacco mosaic virus, tomato yellow leaf curl virus, Verticillium wilt
Colonial (D)	Red fruit; firm and flavorful; productive; good for slicing; hybrid	76 days	7-8 oz.	Anthracnose, Fusarium wilt, Stemphylium gray leaf spot, Verticillium wilt
Dona (I)	Red glossy fruit; flavorful; productive; meaty; few seeds; good for slicing; French origin; open-pollinated	75 days	6-8 oz.	Fusarium wilt, root-knot nematode, tobacco mosaic virus, Verticillium wilt
Early Girl (I)	Red fruit; flavorful, early variety; very productive; meaty; good for slicing; heat tolerant; heat-set; hybrid	52-57 days	4-6 oz.	Fusarium wilt, Verticillium wilt
Fantastic (I)	Red fruit; productive, meaty, classic beefsteak variety; good for slicing; crack resistant; hybrid	70 days	4-7 oz.	Anthracnose, Fusarium wilt, Verticillium wilt
Florida 47 (D)	Red fruit developed for commercial production; good for slicing; grows well in hot, humid, tropical climates; great foliage cover; productive; hybrid	75 days	10 oz.	Alternaria stem canker, anthracnose, Fusarium wilt, root-knot nematode, Stemphylium gray leaf spot, Verticillium wilt
Florida 91 (D)	Red fruit; productive; good for slicing; heat tolerant; crack resistant; hybrid	90 days	9-11 oz.	Alternaria stem canker, anthracnose, Fusarium wilt, root-knot nematode, Stemphylium gray leaf spot, Verticillium wilt
Geronimo (I)	Firm, red fruit; flavorful; very productive; good for slicing; crack resistant; good shelf life; good greenhouse hybrid	78 days	8-10 oz.	Fusarium wilt, Fusarium crown root rot, leaf mold, powdery mildew, tobacco mosaic virus, Verticillium wilt
Goliath (I)	Bright red fruit; early variety; productive; good for slicing; generally blemish-free skin; hybrid	65 days	10-15 oz.	Anthracnose, Fusarium wilt, root-knot nematode, Stemphylium gray leaf spot, tobacco mosaic virus, Verticillium wilt
Heatwave II (D)	Red fruit; early variety; productive; heat tolerant; heat-set; grows well in the deep South; hybrid	68 days	6-7 oz.	Anthracnose, Fusarium wilt, Stemphylium gray leaf spot, Verticillium wilt
Homestead (D)	Red fruit with slightly flattened shoulders; good for slicing; sweet and flavorful; meaty; good foliage; heat tolerant; heat-set; grows well in hot humid climates; crack resistant; open-pollinated	70-85 days	8-9 oz.	Alternaria stem canker, Fusarium wilt

Variety Name & Type[a]	Description	Days to Harvest[b]	Fruit Weight	Resistance
Jet Star (I)	Red fruit; early variety; meaty and flavorful; very productive; low acidity; crack resistant; hybrid	72 days	7-9 oz.	Fusarium wilt, Verticillium wilt
Mountain Fresh Plus (D)	Large red fruit; good for slicing; grows well in cool and wet climate; good foliage; flavorful and sweet; crack resistant; hybrid	75 days	8-16 oz.	Alternaria leaf spot, blossom-end rot, early blight, Fusarium wilt, gray wall, root-knot nematode, Verticillium wilt
Mountain Pride (D)	Red fruit; firm and flavorful; crack resistant; grows well in higher elevations; hybrid	77 days	6-8 oz.	Anthracnose, bacterial speck, Fusarium wilt, Stemphylium gray leaf spot, Verticillium wilt
Mountain Rouge (I)	Red-pink, large fruit; productive; flavorful; good for slicing; hybrid	73 days	12-14 oz.	Fusarium wilt, late blight, root-knot nematode, Verticillium wilt
Mountain Spring (D)	Bright red fruit; early variety; productive, firm and flavorful; good for slicing; crack resistant; hybrid	69 days	10-12 oz.	Alternaria leaf spot, blossom-end rot, Fusarium wilt, Stemphylium gray leaf spot, Verticillium wilt
Phoenix (D)	Red fruit; early variety; productive; good for slicing; heat tolerant; heat-set; crack resistant; hybrid	72 days	8-12 oz.	Alternaria stem canker, anthracnose, Fusarium wilt, Stemphylium gray leaf spot, Verticillium wilt
Pink Girl (I)	Pink fruit; sweet and flavorful; very productive; good for slicing; crack resistant; hybrid	76 days	6-8 oz.	Anthracnose, Fusarium wilt, Stemphylium gray leaf spot, Verticillium wilt
Tasti Lee (D)	Brilliant red fruit; slightly flattened top; sweet and flavorful; very productive; good foliage and shelf life; hybrid	75 days	6-9 oz.	Fusarium wilt, Stemphylium gray leaf spot, Verticillium wilt
Terrific (I)	Red fruit; very sweet and flavorful; meaty; good for slicing; productive; hybrid	70 days	5-8 oz.	Alternaria stem canker, Fusarium wilt, root-knot nematode, Stemphylium gray leaf spot
Tycoon (D)	Red fruit; productive; high quality; heat tolerant; hybrid	65-80 days	9-12 oz.	Fusarium wilt, root-knot nematode, tomato spotted wilt virus, Verticillium wilt
Heirloom				
Arkansas Traveler (I)	Rose-colored fruit; smooth skin; productive; flavorful; good for slicing; drought tolerant; grows well in hot humid climates; crack resistant	80-90 days	6-8 oz.	

Variety Name & Type[a]	Description	Days to Harvest[b]	Fruit Weight	Resistance
Black Krim (I)	Deep purple-red fruit with dark green and slightly flattened shoulders; smoky flavor; good for slicing, productive; heat tolerant; Black Sea region origin	70-80 days	8-16 oz.	
Brandywine (I)	Large, red-pink fruit; smooth red flesh; rich flavor; good for slicing	74-85 days	10-16 oz.	Rust
Bush Beefsteak (D)	Deep red fruit; early variety; productive, sweet and flavorful; good for slicing; cold tolerant	62 days	8-10 oz.	
Carbon or Cherokee Carbon (I)	Dusky purple fruit with dark olive shoulders; blocky and round; very flavorful and productive; good for slicing; crack resistant; tall plants	75-76 days	8-14 oz.	
Cherokee Purple (I)	Large dusky purple-pink fruit with slightly flattened dark green shoulders; smooth globe shape; multicolor flesh (purple, brown, green); rich flavor; productive	72-85 days	8-16 oz.	Rust, Septoria leaf spot
Delicious (I)	Large, scarlet red fruit; meaty and juicy; crack resistant; productive	77 days	16-32 oz.	
Eva Purple Ball (I)	Pink-purple fruit; smooth and round; soft tender flesh; productive; grows well in hot humid climates; crack resistant	70-78 days	5-8 oz.	Blossom-end rot, early and late blight
Green Zebra (I)	Pale yellow-green medium fruit with dark green stripes; bright green flesh; sweet and tangy flavor; low acidity; good for slicing; crack resistant; heat tolerant; productive; good foliage	72-85 days	3-5 oz.	Rust, Septoria leaf spot
Jaune Flamme (I)	Orange fruit; sweet and fruity flavor (similar to Sungold); productive; good for drying; French origin	70-85 days	2-4 oz.	Late blight, rust
Jubilee (I)	Bright golden-orange fruit; productive; thick walls; meaty; mild flavor; low acidity	80 days	8-12 oz.	Anthracnose
Lemon Boy (I)	Bright lemon-yellow fruit; early variety; productive; sweet and flavorful; meaty	72 days	8 oz.	Anthracnose, Fusarium wilt, root-knot nematode, Stemphylium gray leaf spot, Verticillium wilt

Variety Name & Type[a]	Description	Days to Harvest[b]	Fruit Weight	Resistance
Mortgage Lifter (I)	Pink-red fruit with slightly flattened shoulders; sweet and flavorful; meaty; good for slicing; productive	79-85 days	12-32 oz. (can weigh up to 4 lbs.)	Alternaria stem canker, early blight, Fusarium wilt, root-knot nematode, Verticillium wilt
Persimmon (I)	Rose-orange persimmon-colored fruit; flavorful; low acidity; productive; good for slicing; blemish-free skin; Russian origin	81-88 days	12-16 oz. (can weigh up to 2 lbs.)	Late blight
Pruden's Purple (I)	Large, deep pink fruit; slightly ribbed; smooth flesh texture; flavorful; productive; meaty; few seeds; heat and cold tolerant; crack resistant; rivals Brandywine	67-72 days	12-16 oz.	Rust
Rose de Berne (I)	Dark rose fruit; sweet and tart flavor; meaty; good for slicing; crack resistant; Swiss origin	75 days	4-8 oz.	Late blight, rust
San Marzano (I)	Vibrant red fruit with pointed ends; flavorful; thick walls; peels easily; few seeds; very productive; crack resistant; classic paste variety; Italian origin	75-80 days	4-6 oz.	Rust
Stupice (I)	Red-orange fruit with green shoulders; early variety; productive; good for slicing; flavorful and juicy; cold tolerant; Czech Republic origin	55-65 days	3-4 oz.	
Sunray (I)	Golden-orange fruit; sweet and flavorful; productive; meaty; good for slicing; good foliage; grows well in hot, dry climates; heat and drought tolerant	75 days	8-10 oz.	Fusarium wilt, Verticillium wilt
Yellow Pear (I)	Small, lemon-yellow, pear-shaped fruit; mild and tangy flavor; productive; heat tolerant	70-78 days	0.75-1 oz.	Alternaria stem canker, Fusarium wilt, rust
Zapotec Pleated, Oaxacan Ribbed (I)	Bright red, heavily ribbed fruit; sweet and flavorful; very productive; few seeds; good for slicing or stuffing; Mexican origin	85-86 days	10-16 oz.	
Roma or Paste				
Picus Roma (D)	Deep red fruit; large and blocky; uniform; firm; productive; heat tolerant; heat-set; good foliage; adaptable hybrid	75 days	4-5 oz.	Alternaria stem canker, Fusarium wilt, Stemphylium gray leaf spot, tomato spotted wilt virus, Verticillium wilt

Variety Name & Type[a]	Description	Days to Harvest[b]	Fruit Weight	Resistance
Plum Regal (D)	Deep red fruit; bright red flesh; flavorful; productive; good foliage; crack resistant; hybrid	75 days	3-4 oz.	Early and late blight, Fusarium wilt, tomato spotted wilt virus, Verticillium wilt
Roma Paste (D)	Deep red fruit; uniform; plum-shaped; rich flavor; productive; thick walls; vigorous; open-pollinated	65-78 days	4 oz.	Alternaria stem canker, Fusarium wilt, rust, Verticillium wilt
Viva Italia (D)	Deep red fruit; flavorful, meaty; thick wall; productive; heat tolerant; heat-set; hybrid	72-75 days	3-4 oz.	Anthracnose, bacterial speck, Fusarium wilt, root-knot nematode, Verticillium wilt
Grape or Cocktail				
Cupid (I)	Red fruit; productive all season; flavorful; good shelf life; crack resistant; hybrid	62 days	0.5-0.75 oz.	Alternaria stem canker, anthracnose, bacterial speck, Fusarium wilt, Stemphylium gray leaf spot
Juliet (I)	Deep red, shiny fruit; flavorful and sweet; crack resistant; good shelf life; very productive; hybrid	60-62 days	1.5-2 oz.	Early and late blight, Stemphylium gray leaf spot
Mountain Magic (I)	Cocktail-sized, bright red fruit; uniform; productive; sweet and flavorful; crack resistant; Campari-type; hybrid	66-70 days	2 oz.	Fusarium wilt, early and late blight, Verticillium wilt
Red Grape (I)	Bright red fruit; flavorful; productive; hybrid	59 days	0.5-0.75 oz.	Fusarium wilt, root-knot nematode, tobacco mosaic virus
Smarty (I)	Bright red fruit; flavorful; sweet; crack resistant; hybrid	69 days	0.5-1 oz.	Fusarium wilt, Verticillium wilt
Sugary (semi-D)	Red-pink glossy fruit; sweet and flavorful; early variety; productive; crack resistant; hybrid	60 days	1-2 oz.	
Cherry				
Baxter's Early Bush (D)	Red fruit; productive; crack resistant; compact plant; open-pollinated	72 days	2 oz.	
Black Cherry (I)	Purple-black fruit; sweet; rich and complex flavor; meaty; productive; open-pollinated	55-75 days	1-1.5 oz.	Rust
Gold Nugget (D)	Golden-yellow fruit; slightly oval, early variety; productive; mild flavor; low acidity; crack resistant; compact plant; open-pollinated	56-60 days	1 oz.	Verticillium wilt

Variety Name & Type[a]	Description	Days to Harvest[b]	Fruit Weight	Resistance
Golden Gem (I)	Golden-yellow fruit; early variety; sweet and flavorful; productive; crack resistant; Chinese origin; hybrid	65 days	0.5-0.75 oz.	
Husky Cherry Red (I)	Red fruit; early variety; productive; sweet and flavorful; hybrid	65 days	0.5-0.75 oz.	Anthracnose, Fusarium wilt, Verticillium wilt
Mountain Belle (D)	Bright red fruit; early variety; productive; very sweet and flavorful; crack resistant; open-pollinated	68 days	0.5-0.75 oz.	Fusarium wilt, Verticillium wilt
Red Cherry (I)	Bright red fruit; sweet and tangy; productive; heat tolerant; open-pollinated	72-75 days	0.5-0.75 oz. (small variety) or 1-1.25 oz. (large variety)	Fruit worm
Sun Gold (I)	Bright tangerine-orange fruit; very productive; sweetest cherry type; flavorful; early maturing; thin skin and prone to crack; hybrid	57-65 days	0.75-1 oz.	Fusarium wilt, root-knot nematode, tobacco mosaic virus, Verticillium wilt
SunSugar (I)	Orange fruit; very productive; early variety; very sweet and flavorful; crack resistant; hybrid	62 days	0.5-0.75 oz.	Fusarium wilt, tobacco mosaic virus
Supersweet 100 (I)	Red fruit; early variety; very productive; sweet and flavorful; hybrid	60-65 days	1 oz.	Fusarium wilt, root-knot nematode, Verticillium wilt
Sweet Chelsea (I)	Red fruit; early variety; productive; sweet and flavorful; drought tolerant; crack resistant; hybrid	65 days	0.75-1 oz.	Fusarium wilt, root-knot nematode, tobacco mosaic virus, Verticillium wilt
Sweet Million (I)	Red fruit; very productive; very sweet and flavorful; crack resistant; hybrid	65 days	0.5-0.75 oz.	Fusarium wilt, root-knot nematode, Stemphylium gray leaf spot, tobacco mosaic virus, tomato spotted wilt virus, Verticillium wilt

[a] *Determinate (D) or Indeterminate (I).*

[b] *From transplant to harvest.*

Table varieties selected from recommendations from LSU AgCenter, UF Extension, Texas A&M Agrilife Extension and Southeastern U.S. Vegetable Crop Handbook.

Variety descriptions compiled from High Mowing Organic Seeds, Johnny's Selected Seeds, Reimer Seeds, Southern Exposure Seed Exchange, Sow True Seed, All-America Selections, Jordan Seeds, Seedway and Harris Seeds.

Other recommended tomato varieties for Louisiana include:

Fresh Market/Beefsteak: BHN 216, BHN 640, BHN 669, BHN 876, BHN 981, Big Box, Carnival, Crista, First Lady, Floralina, Floramerica, Giant Belgium, Golden Girl, Mountain Delight, Porter Improved, Quincy, Red Defender, Red Line, Red Rose, Solar Fire, Spitfire, Starbuck (good greenhouse variety), Sun Leaper, Sun Master, Sun Start, Sunbeam, Sunchaser, Super Fantastic, Sure Fire, Taxi, Torero (good greenhouse variety), Tribeca, Tribute.

Roma/Paste: Chico III, Classica, Golden Rave, Muriel Roma.

Cherry: Cherry Grande, Jolly, Small Fry, Sugar Snack, Suncherry, Sweet Baby Girl, Vita-Gold, Yellow Cherry.

When and How to Plant

Tomatoes are warm-season, frost-sensitive annuals. Tomato seeds should be started inside 6-8 weeks before the desired transplant date (refer to Tomato Planting Guide Table 2). Using seed germination trays with at least 1.5-inch diameter cells (larger cells work well for this crop too), plant one seed per cell at a shallow depth, about 1/8-inch deep, or just deep enough to be covered with a thin layer of soilless potting mix (see Figure 5).

Figure 5. Planting seeds in a germination tray.

Seeds will germinate best in a warm, well-lit area in soil temperatures between 60 and 85 degrees Fahrenheit. Tomato seeds will germinate very slowly in cooler soil. The minimum soil temperature for germination is 50 F and maximum 104 F. It is important to keep soil moist, which usually requires daily light watering. A seedling heat mat and plastic dome lid are helpful in maintaining ideal germination conditions. Once several true leaves develop, it is recommended to move plants into larger 3-4-inch pots to allow for more root growth before transplanting outside. At this stage, seedlings can be kept at 60-70 F.

Tomato plants easily survive transplanting (see Figure 6), but seedlings are susceptible to cold-shock and growth may be stunted if soil and air temperatures are too low. Aim to transplant outside when the temperature is between 65-75 F with a minimum temperature of 60 F. There should be no danger of frost. Ideally, plant during a cloudy day or plant late in the day or even at night to reduce wilt. A few days before planting transplants outside, it is recommended to follow a hardening off process to transition seedlings to outdoor conditions. Refer to the Tomato Planting Guide (Table 2) for the recommended spacing when transplanting.

Table 2. Tomato Planting Guide

Transplant Outside Dates	Plant Spacing (Feet)	Row Spacing (Feet)	Days to Harvest*
North LA: March 20-May South LA: March-May	Determinate: 1-2’ Indeterminate: 2-3’	Determinate: 4-5’ Indeterminate: 5-6’	90-110 days (60-85 days)

**First range of days: seed to first harvest. Second range of days in parenthesis: transplant to first harvest.*
Note: Table adapted from LSU AgCenter and UF Extension planting guides and Southeastern U.S. Vegetable Production Handbook.

Tomato plants should be planted about 6 inches deep, or to the lowest leaf, as roots will form on the buried stem and this will encourage a stronger plant. This method will also correct a plant that has bent toward the sun to an upright position (see Figure 6).

Figure 6. Plant tomato plants deep (to the first leaf) for a stronger plant.

Tomato plants are sensitive to cold temperatures below 50 F and hot temperatures above 95 F as this may cause blossom drop, poor fruit set or cat-facing (deformed fruit). The optimum growing conditions are warm days (80-85 F) and cooler nights (60-70 F).

Where to Plant

Tomatoes are a warm-season crop, and a well-drained clay or loam (sandy or silty) soil and full sun (6-8 hours per day) are recommended. Tomato plants prefer a soil pH between 6.0 and 6.8 but will tolerate acidic soil as low as 5.5. Avoid planting in heavy soils and low areas prone to flooding. It is recommended to plant tomatoes in box beds or in traditional raised garden rows that are about 6 inches tall to ensure good drainage and prevent disease. In all types of gardens, it is recommended to add a 2-3-inch layer of compost, peat, rotted hay or other organic matter and mix into the soil to optimize plant health. This is especially important for tomato plants as they thrive in soil high in organic matter, phosphorus and calcium. To prevent blossom-end rot, use calcitic lime or gypsum if needed. Be sure the soil is not too high in nitrogen.

Reflective plastic mulch or a plastic fabric/film mulch is recommended to increase soil temperature, yield, fruit size and quality while controlling weeds. White plastic is recommended for growing tomato plants in temperatures above 85 F, as this will keep the soil cooler during warm weather fruit production. Black plastic is only recommended for cooler climates and during the spring in Louisiana. Drip irrigation is also recommended when using plastic mulch to maintain ideal soil moisture and to encourage productive plants.

Each season rotate plant families, which means avoiding planting crops from the same plant family in the same area of the garden, to reduce disease and pests. A longer crop rotation of 4 years is recommended for Solanaceous crops like tomatoes to reduce pest pressure and risk of disease.

Plant Care

Watering: Check for adequate soil moisture every 2-3 days. The soil should remain moist, but take care to not oversaturate as this encourages blossom-end rot. Drip irrigation helps to meet the high water demand for this crop, which is about 1-1.5 inches per week depending on soil type and temperature. This is especially important during the fruiting stage. Deep watering is important to strengthen the root system. If plants are stressed for adequate water, this will significantly impact tomato production.

Fertilization: Insufficient potassium may lead to yellow shoulders on fruit and a tough, white core during hot summer temperatures. Blossom-end rot, a very common tomato nutritional disorder, is caused by lack of calcium. Soil may have sufficient calcium levels, but if the gardener fails to water enough, calcium may not be dissolved in the soil for root uptake. If watering practices are corrected and blossom-end rot persists, conduct a soil test and discuss results with a local county extension agent.

Organic fertilizers, such as compost, fish emulsion, composted poultry litter or manure, worm castings, and blood or bone meal, originate from living organisms. They are safer and far more environmentally sustainable than traditional synthetic fertilizers. They naturally release nutrients more slowly and over a longer period of time. When applying organic fertilizer, it is important to use in unison with compost, cover crops and crop rotation, which all work together to build soil health. Learn how to convert inorganic fertilizer recommendations to organic fertilizers here.

Alternatively, a synthetic fertilizer may be used at a rate of about 1.5 pounds (3 cups) of 13-13-13 for every 25 feet of row or 75 square feet. Broadcast, or sprinkle

evenly, over the soil before planting and then mix in about 3-6 inches deep using a rake. Supplemental side-dressing, or reapplication of synthetic or organic fertilizer, is recommended when the first immature fruits are visible. Side-dressing is the addition of fertilizer to the soil around already established plants when the plant begins to fruit or vine, primarily to provide nitrogen. If using synthetic fertilizer, sprinkle 2 tablespoons around each plant, keeping it about 6 inches away from the plant stem, and water into the soil. Indeterminate tomatoes require the application of additional side-dressing every 3-4 weeks until the end of the crop. Fish emulsion is a good, quick-release source of nitrogen if using organic fertilizers.

Support: Staking of tomatoes improves fruit quality by keeping plants and fruit off the ground so they are easier to harvest than ground tomatoes. Determinate tomato plants are often staked even though the stems do not grow tall. Indeterminate tomato plants must be supported to train the stem to grow vertically and support the weight of the fruit on very tall stems. This will also optimize yield and fruit quality. There are many options to support tomato plants, but cages are not recommended as they prohibit air circulation and increase risk for disease. Here are three methods to support tomato plants:

1. Use one wooden stake per tomato plant (recommended for a few plants). Drive 1-inch-square wooden stakes about 12 inches deep before transplanting tomatoes at the recommended plant spacing intervals (about 24 inches). For determinate tomatoes, use stakes that are 4-5 feet tall. For indeterminate tomatoes, use stakes that are 8 feet tall. One transplant should be planted beside each stake. Once the seedlings are 12-15 inches tall, secure to the stakes using an elastic nylon band and tie in a loose loop to prevent future stem girdling. Continue securing the plants to the stakes for every 12-15 inches of growth. See Figure 7 and this video on the method. Start the video at 3:30.

2. Use the Florida Weave technique, which is recommended for a row of plants. Place a metal T-post at the end of each row and one in the middle. Then, place 1-inch square wooden stakes between every few tomato plants. For determinate tomato plants, use stakes that are 4-5 feet tall. For indeterminate tomatoes, use 8-foot tall stakes. When the plants are 12-15 inches tall, use garden, tomato or nylon twine to run lines about 10 inches above the soil. On each side of the row of plants, weave between each plant and tie the twine to the stakes. In this method, the plant is never tied to the twine or stake. It is recommended to weave additional levels of trellis for every 12-15 inches of plant growth, or about 12 inches above the last support weave. Watch this helpful video tutorial on the Florida Weave system.

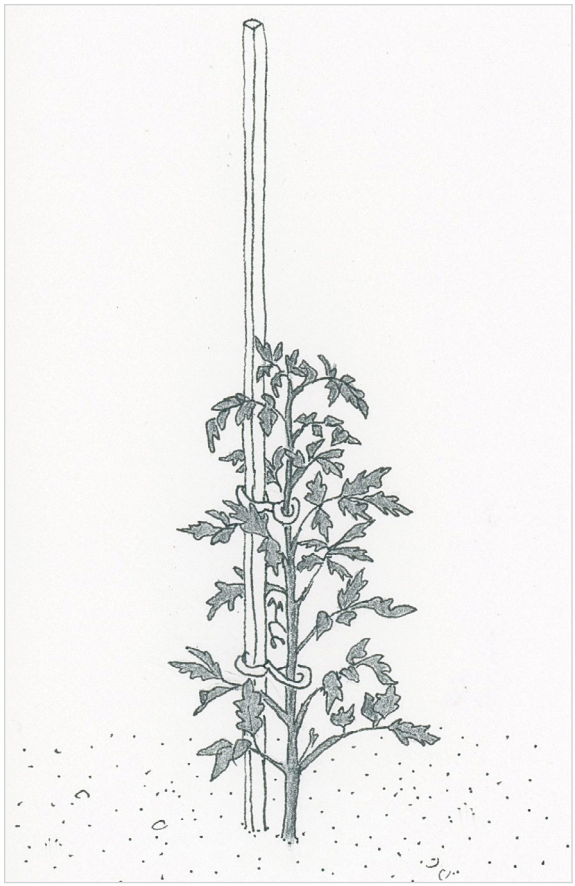

Figure 7. Staking and securing tomato plants.

3. Use a vertical trellis, which is recommended for a row of plants and requires minimal staking. Drive metal T-posts that are 8-10 feet tall about 2 feet into the ground between every 4-5 tomato plants. This will likely require a T-post driver or pounder tool. Then hang a heavy single strand of wire (about 9 gauge) between each post or attach another structure above. From this wire or structure, hang garden, tomato or nylon twine down to each tomato plant. Attach the twine to the base of each plant in a very loose knot that will not be at risk for choking the stem as it grows. Start wrapping the stems around the string early, taking care not to pinch the leaves, and continue to do so as the plants grow. In this method, the plants are never tied to stakes or posts. See Figure 8.

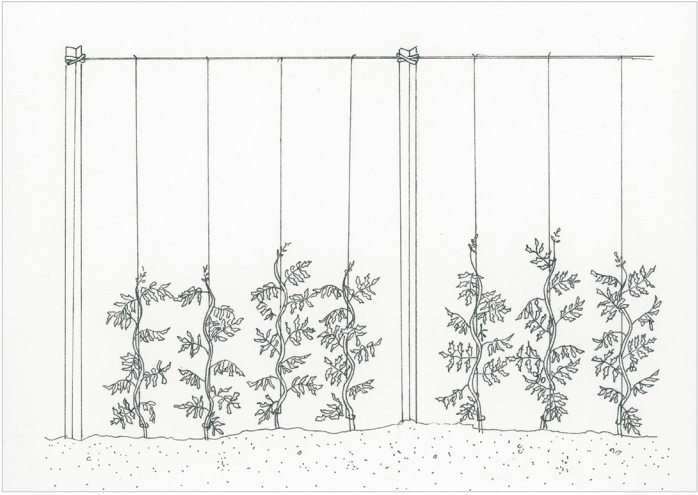

Figure 8. Vertical trellis method for supporting tomato plants.

This video is helpful in showing how to set up the vertical trellis, and this video describes the process of winding twine around the stems. For someone who is more skilled in carpentry, this video shows a simple but sturdier design for a vertical tomato trellis that could function as a permanent addition to a raised garden bed.

Suckering and pruning: Pruning and suckering are essential for optimal fruit size and yield while also controlling pests and preventing disease. Pruning is practiced to establish a desired balance between vine growth and fruit growth. Little to no pruning results in a plant with a heavy load of smaller fruit. Moderate pruning results in fewer fruits that are larger and easier to harvest. Pruning can result in earlier maturity of the crown fruit and improves spray coverage and pest control. The amount of pruning that is recommended is dependent on the specific variety, the season and growing conditions.

Removing suckers is an ongoing process of removing the buds or suckers that would produce additional side shoots off the main plant stem. Suckering can be done by pinching off shoots by hand unless they have grown more than a few inches, then sharp snips or clippers should be used to prevent damage to the plant during removal. See Figure 9.

1. Here is a short, simple video on how to sucker and prune tomato plants.
2. Here is a longer, more detailed video on how to sucker and prune tomato plants, along with additional helpful tomato growing tips.

Figure 9. Suckering a tomato plant.

Indeterminate varieties should be pruned to one or two main stems, removing all suckers along those main stems. It is generally not recommended to prune determinate varieties as they have a limited stem growth and are generally bushier and less vigorous. For all varieties, be sure to prune the lower leaves and stems to keep the base of the tomato plants clear; there should be no leaves touching the ground.

Weeds: Plastic mulch will control most of the weeds. Hand pull weeds close to the plant, especially in the planting holes. Organic mulches, such as hay and straw, may also be used to control weeds in plant rows.

Insect pests and disease: Aphids and thrips are common insect pests for tomato plants and can transmit harmful viruses like tomato spotted wilt virus and tobacco mosaic virus. Tomatoes are susceptible to viruses (e.g., tomato spotted wilt virus and tobacco mosaic virus), fungal diseases (e.g., anthracnose) and physiological disorders (e.g., blossom-end rot and sun scald). Many tomato varieties are resistant to specific diseases, and these should be selected and planted — especially if the garden has been afflicted by one or more diseases in previous growing seasons. Generally recommended ways to prevent diseases are using reflective mulch, avoiding overhead irrigation and crop rotation. See Table 3 to aid in diagnosis and management of some common tomato insect pests and diseases.

Table 3. Organic and Natural Management for Common Tomato Insect Pests and Diseases

Symptoms	Diagnosis	Organic and Natural Management
• Occurs before fruit set • Irregular brown-black elongated cankers or spots on stem • Dark brown sunken lesions with concentric rings on green fruit • Stem girdling and collapse	Alternaria stem canker	• Plant resistant varieties • Crop rotation • Improve airflow • Organic/natural fungicides
• Wet, humid conditions • Black spots on fruit	Anthracnose	• Crop rotation (3 years) • Plant resistant varieties • Avoid working in fields when plants are wet • Mulch; avoid overhead irrigation • Regular harvest; remove diseased fruit • Organic/natural fungicides
• Curled and yellowed leaves • Stunted crops • Sticky honeydew on leaves	Aphids	• Timely planting and harvest • Reduce water stress • Weed control • Use water jet to dislodge • Reflective mulches, insect barrier fabric • Beneficial insects: lady bugs lacewings, predatory stink bugs, syrphid flies • Insecticidal soap, neem oil, pyrethrin, Azera
• Warm, humid conditions • Small yellow-green, water-soaked spots on lower, older leaves • Older spots become brownish-black with yellow halo • Yellowed leaves, defoliation • Blossom drop and yield loss	Bacterial leaf spot	• Plant resistant varieties • Avoid overhead irrigation • Avoid working in fields when plants are wet • Reduce plant stress • Copper-based fungicide sprays
• Green-yellow or black sunken spot on bottom of fruit • Premature fruit ripening • Calcium deficiency • Drought stress, root damage • Over-irrigation, high humidity	Blossom-end rot	• Plant resistant varieties • Keep soil pH at 6.0-6.5 • Fertilize (abundant calcium) and mulch • Adequate, consistent irrigation, avoiding very wet/very dry cycles • If soil calcium deficient: drench soil around plants with calcium solution; remove fruit
• Soilborne fungus • Leaf blight and defoliation, low-quality fruit, sun scald • May cause collar rot, stem canker, and fruit rot	Early blight	• Plant resistant varieties • Crop rotation • Remove plant debris and till under remaining residue • Prune lowest leaves and apply a mulch • Avoid overhead irrigation • Organic/natural fungicide sprays

Symptoms	Diagnosis	Organic and Natural Management
• Small irregular holes in leaves • Concentrated damage in young plants and seedlings • Stunted plants, reduced yield	Flea beetle	• Timely planting • Perimeter trap cropping • Super Light Insect Barrier or AgroFabric Pro to protect transplants • Crop rotation • Reflective mulches • Beneficial organisms: parasitic nematodes • Insecticidal oil, spinosad, pyrethrin, Azera
• Larvae/caterpillars bore into fruit and eat leaves • Hornworms have a horn on the back end, green with stripes • Fruit decay and rot • Defoliation	Hornworm and fruitworm	• Weed control, timely fruit harvest • Pheromone traps Insect netting • Hand pick and destroy larvae/ caterpillars • Till under crop debris each season to reduce overwintering insects • Beneficial insects: assassin bugs, lacewing, lady beetles, parasitic wasps • Insecticides: Azera, *Bacillus thuringiensis*, insecticidal soap, pyrethrin, spinosad, neem
• Soilborne fungus • Fast-spreading and sporadic • Mild, moist weather • Irregular, water-soaked dark lesions on leaves which enlarge to green-black blotches • White, downy fungal growth on underside of lesions	Late blight	• Plant resistant varieties • Moisture management • Remove and destroy infected plants • Organic/natural fungicides
• Small yellow larvae • Tunnels inside leaves with white trails	Leaf miners	• Row covers • Beneficial insects: parasitic wasps • Remove infected leaves
• Uneven distribution of stunted plants • Pale green/yellow leaves; wilt • Root galls, knots, swellings	Root-knot nematodes	• Plant resistant varieties • Crop rotation with nonhost crops (corn, marigolds) • Plant early; mulch; weed control • Soil solarization, nematicides
• Girdled stem • Plant wilt and death • White fungal growth, mustard seed-like structures at plant base	Southern blight	• Remove diseased plants and topsoil • Crop rotation

Symptoms	Diagnosis	Organic and Natural Management
• Humid climate • Defoliation and sunscald • Small, dark brown specks on leaves expand to spots with a yellow halo • Lesions enlarge and center turns gray and cracked	Stemphylium gray leaf spot	• Plant resistant varieties; cherry and grape tomatoes are more susceptible • Avoid overhead irrigation; morning watering • Crop rotation and adequate plant spacing • Remove diseased plants and till under crop debris • Organic/natural fungicide
• Transmitted by aphids • Mottled (mosaic) light and dark green foliage • Stunted plants • Uneven fruit ripening; yield loss	Tobacco mosaic virus	• Plant resistant varieties • Reflective mulch • Remove diseased plants
• Transmitted by thrips • Black, irregularly shaped lesions on leaves • Discolored or lesioned fruit • Stunted plants; wilt	Tomato spotted wilt virus	• Plant resistant varieties • Weed control; reflective mulch • Remove diseased plants
• Transmitted by whiteflies • Yellowed and distorted leaves • Stunted plants; small leaves; bushy appearance • Reduced yield; blossom drop	Tomato yellow leaf curl virus	• Plant resistant varieties • Manage whiteflies, cover plants with floating row covers • Weed control, reflective mulch • Remove and discard infected plants
• Leaf discoloration and wilt • Tiny white flies flutter when plants are disturbed • Sticky honeydew on leaves • Black sooty mold fungus	Whiteflies	• Regular monitoring of plants • Crop rotation • Insect netting (50+ mesh) • Beneficial insects: lacewings, parasitic wasp, predatory mites • Insecticidal soap, neem oil, *Beauveria bassiana*
• Plants wilt and die • Brown streaks inside root and stem when split lengthwise • Bacterial wilt is transmitted by the cucumber beetle	Wilt (bacterial, *Fusarium, Verticillium*)	• Long crop rotation • Control cucumber beetles • Remove infected crop debris • Control weeds

Note: Adapted from LSU AgCenter, Texas A&M AgriLife Extension, UMass Extension, Alabama A&M and Auburn Universities Extension, Connecticut Agricultural Experiment Station, University of California and University of Tennessee Extension. The Louisiana Pesticide Law regulates the use of pesticides in schools to protect children and staff from harmful exposure to chemicals and is enforced by LDAF. The recommended alternative to routine pesticide use is Integrated Pest Management (IPM), which combines pest control, disease management techniques and organic/natural alternatives, many of which are found in this table.

Harvest and Storage

Tomatoes may be harvested unripe and green, or at any stage of ripeness usually marked by a color change to red, pink, orange, yellow or purple. Fruit can be harvested with just a blush of color, as ripening continues after harvest. For the best quality taste, harvest ripe fruit that are firm and glossy and easily dislodge from the plant. Harvest the fruit by hand, lifting from the plant. Remove the pedicel (stem) to encourage ripening and prevent the bruising of other fruit. During peak production, tomatoes may be harvested 2-3 times per week for at least 3-4 weeks for determinate varieties or 5-6 weeks for indeterminate varieties or until fruit production stops. The fruit is bruised easily and should be handled with care post-harvest.

Ripe tomatoes stored at 50-70 F with high humidity (85%-95%) will hold for 4-7 days; green or partially ripe tomatoes for 1-3 weeks. Take care not to store tomatoes below 50 F as they are cold sensitive and taste and texture will be adversely affected.

Preserve tomatoes by canning, drying or freezing.

Nutrition

Tomatoes Are Nutritious and Good for You

Good source of vitamin A
Important for eye health, a strong immune system and cell growth.

High in potassium
Essential for body function, especially the heart, kidney, nerves, bones and muscles.

Rich in vitamin C
Important for bones, skin, blood vessels.

Contains the carotenoid lycopene
Antioxidant that may prevent cancer and improve heart health.

Recipes

Basics of cooking with tomatoes: extension.purdue.edu/foodlink/food.php?food=tomato
General information on selecting, pairing, preparing and storing. Also includes a list of recipes.

Video on how to cut tomatoes: youtu.be/9etWL1LuJOo
Ever wondered about the basics of how to prepare tomatoes? Chef Allison Kingery shows a couple of options for preparing a couple of varieties of this tasty vegetable.

Taste Test Ideas

Tomato Bruschetta

Tomato Salsa and Chips

Tomato Sauce and Pasta

Other websites with many tomato recipes:

Oregon State University's Food Hero	foodhero.org/recipes/categories/2091 Recipes include baked tomatoes with cheese, breakfast burritos and more.
Arizona Health Zone	Visit www.azhealthzone.org/recipes and search for tomato recipes.
California's Eat Fresh	Visit eatfresh.org/find-a-recipe and search for tomato recipes.
Produce for Better Health Foundation	fruitsandveggies.org/fruits-and-veggies/tomato/?view=recipes Recipes include gazpacho, chili, stuffed pepper soup and more.

Louisiana Harvest of the Month Program recipe: Tomato Cucumber Salad

The Louisiana Harvest of the Month program is designed to bring fresh local agricultural products into participating schools and communities. Each month, one Louisiana agricultural product is highlighted throughout the school. All Louisiana Farm to School recipes are developed, tasted and rated by the LSU College of Agriculture School of Nutrition and Food Sciences. In addition to being tested for overall flavor, color and texture, we strive for recipes that have low-cost and easy-to-find ingredients, easy-to-follow instructions and a reasonable preparation time.

Louisiana HARVEST of the MONTH

Tomato & Cucumber Salad

Home Recipe

Serves: 4
Prep Time: 10 minutes

Ingredients

Dressing

- ¼ cup of olive oil
- 2 Tbsp of red wine vinegar
- 1 tsp of dried oregano
- ½ tsp salt
- Freshly cracked pepper

Salad

- 4 Roma tomatoes OR 2 medium tomatoes (1 cup)
- 1 medium cucumber (⅔ cup)
- ½ of a small red onion (⅓ cup)

Nutrients Per ½ Cup Serving

Calories	140
Total Fat	14 g
Saturated Fat	2 g
Cholesterol	0 mg
Sodium	5 mg
Carbohydrates	5 g
Dietary Fiber	1 g
Protein	1 g
Calcium	20 mg
Iron	1 mg
Potassium	236 mg
Vitamin C	11 mg
Vitamin A	28 mcg

Cooking Instructions

1. Whisk olive oil, red wine vinegar, oregano, salt and freshly cracked pepper in a bowl OR combine in a jar and shake until mixed. Set the dressing aside to allow the flavors to blend.
2. Thinly slice* tomato, cucumber and red onion. Place them in a large bowl.
3. Pour the dressing over the sliced vegetables and toss to coat. Serve immediately or refrigerate until ready to eat. The onions will become milder as they marinate in the dressing.

*Vegetables can be diced if preferred.

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