

Who Are Master Gardeners?

Master Gardeners of Placer County

- ❖ Extend **research-based**, sustainable gardening and composting information
- ❖ Present accurate, impartial information to **home gardeners**
- ❖ Encourage public to make **informed** gardening decisions



Who Are Master Gardeners?

Where to find us...

Online, in the Media, and Special Publications

- ❖ Hotline: Call **(530) 889-7388** or submit your questions online
- ❖ Website: pcmg.ucanr.org
- ❖ Facebook, Twitter, Instagram
- ❖ Gold Country Media monthly column
- ❖ *Curious Gardener* monthly newsletter, subscribe on website
- ❖ *Calendar and Gardening Guide*
- ❖ *School and Community garden consulting*



Totally Tomatoes

From Seed to Seed

Placer County Master Gardeners

David Warman



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Tomato

Nightshade Family of Plants: *Solanaceae* (Peppers, Potato, Eggplant)

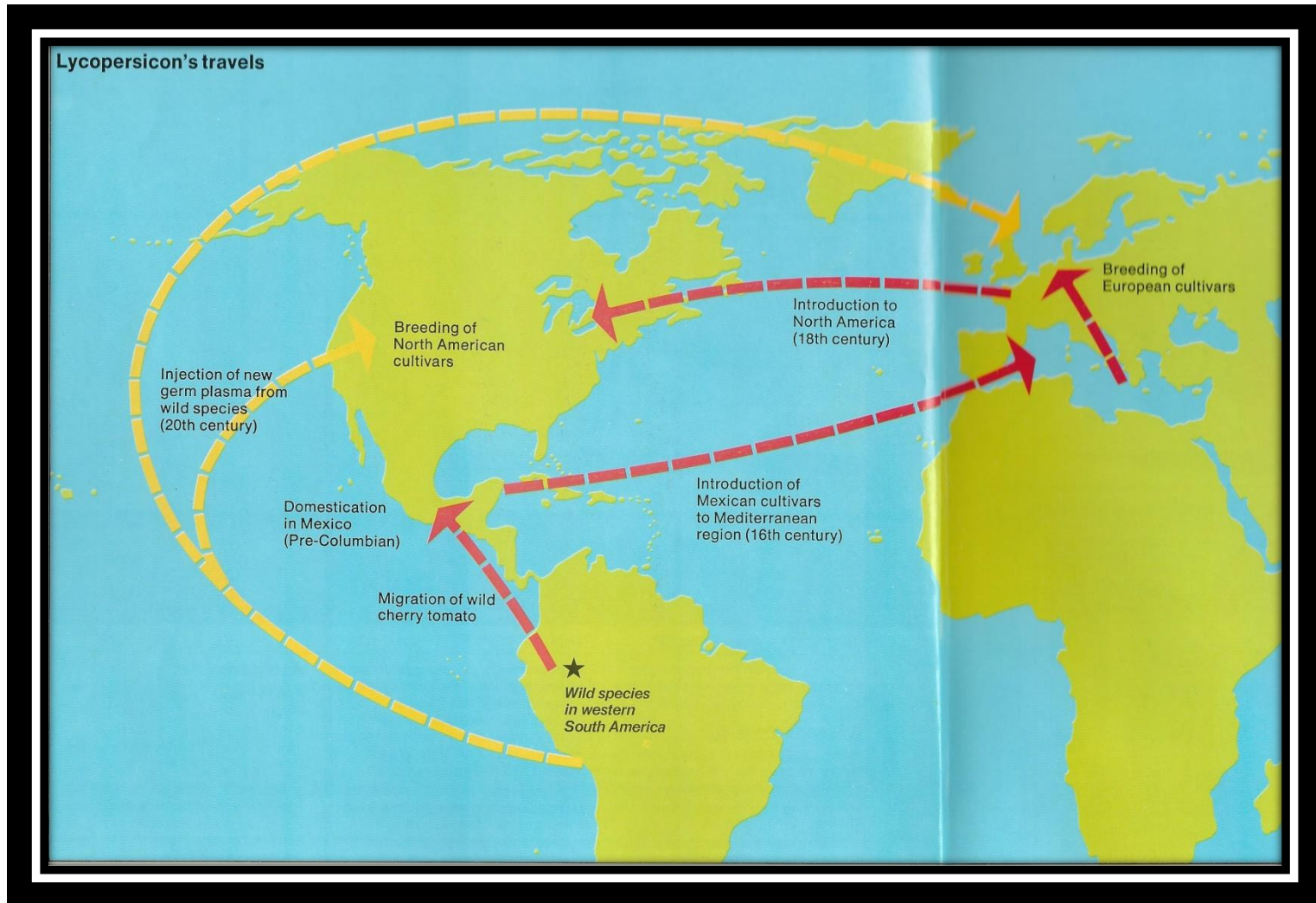
Originally know as “love-apple” plant.

Originally thought to be poisonous.

Edible fruit although labeled as a vegetable.



Lycopersicon – World Traveler



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Not Well Received at First

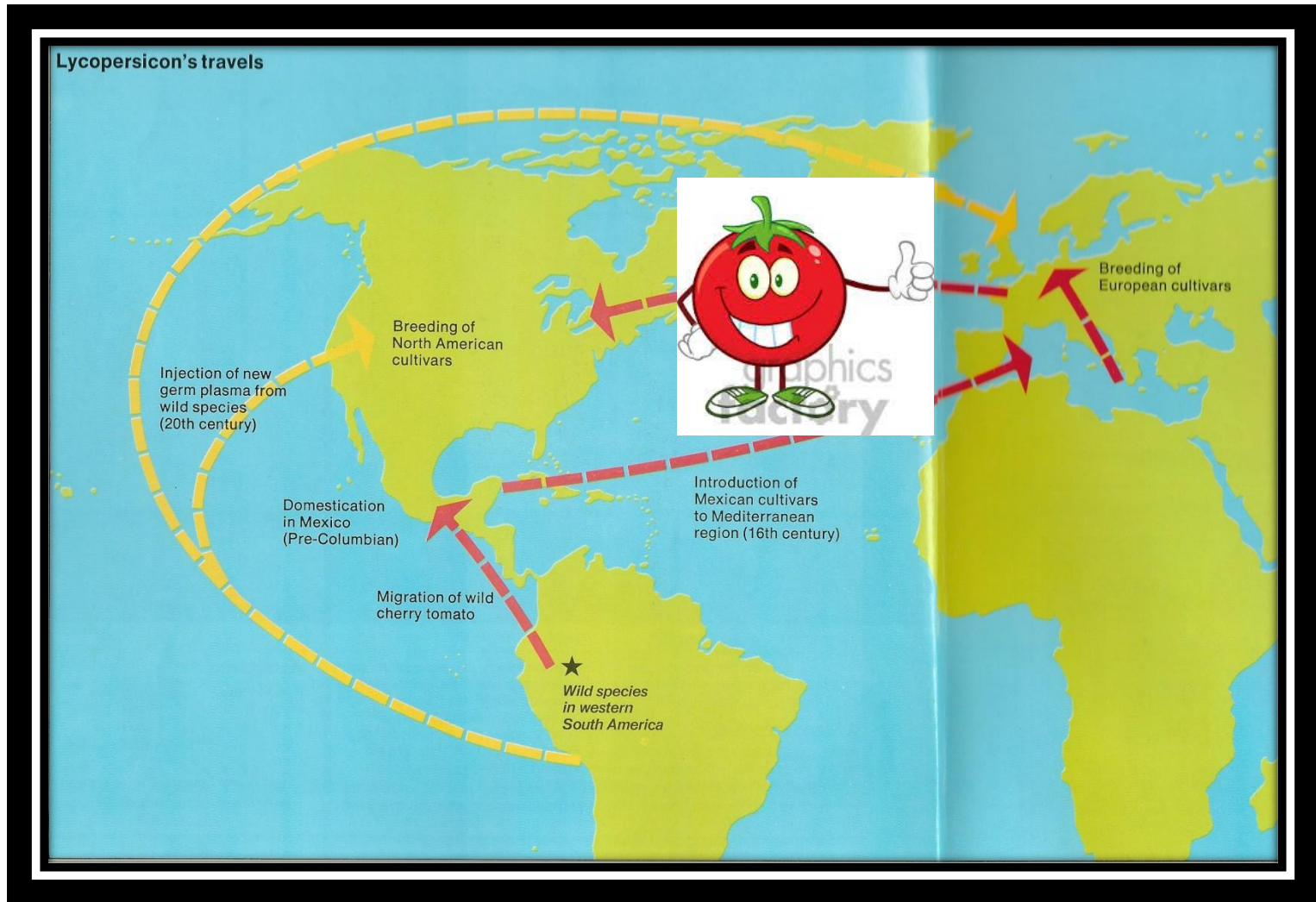


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Finally Accepted



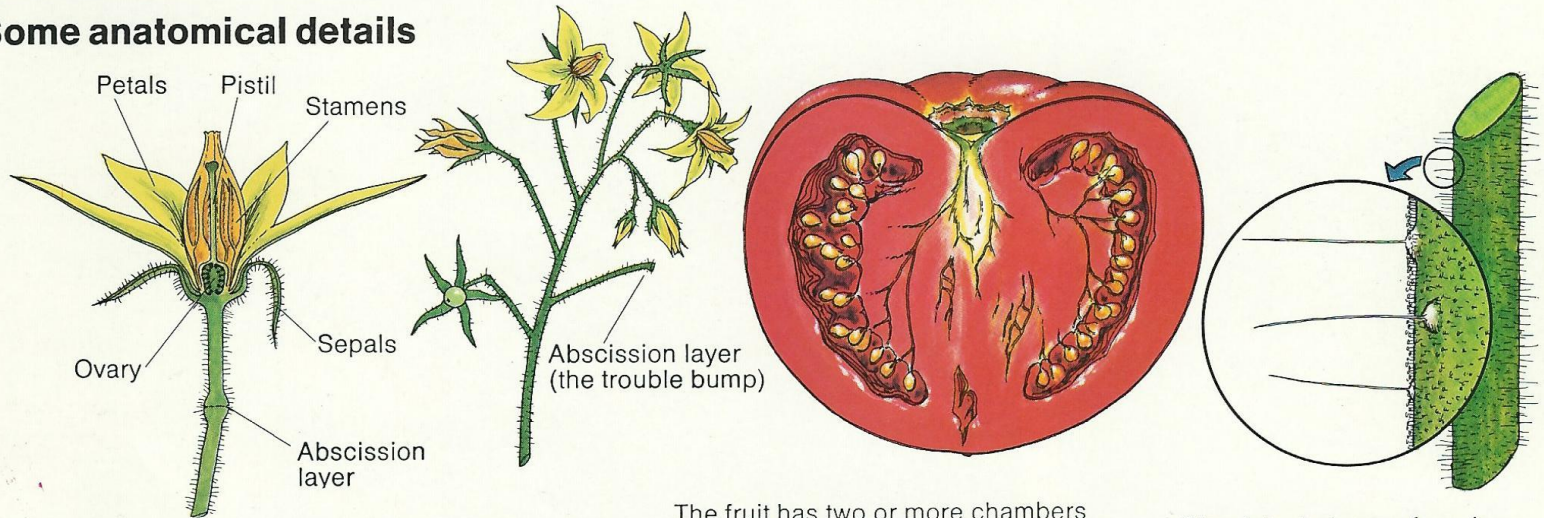
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Anatomy of a Tomato

Some anatomical details



Tomato flowers are complete with both male and female organs and are mostly self-fertilizing. When fruit fails to set and blossoms drop the abscission layer is where it happens (see page 10).

The fruit has two or more chambers called "locules." Large-fruited varieties have 5 to 10. A gelatin-like substance surrounds the seeds.

Glandular hairs are found on stems and leaves. When bent they give off the oil that give tomatoes their characteristic odor.



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Heirloom vs. Open Pollinated vs. Hybrid

What's Going On?

Open pollinated or Standard

- ❖ True to type
- ❖ Reproduces itself from seed

Heirloom (always open pollinated)

- ❖ Introduced more than 50 years ago
- ❖ Must have a history of its own

Hybrid

- ❖ Cross-bred by human intervention
- ❖ Not true to type
- ❖ Bred for specific improvements



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World Record Tomato 7 lbs 12 oz

My record is 2.1 lbs



Open vs. Hybrid Pollination

Standard pollination

POLLINATION: Pollen grains are released by the anther and some fall or float in the air to the stigma, usually of the same flower, where they adhere to the sticky surface.

FERTILIZATION: When pollen grains germinate and send tubes with the pollen tube nucleus (sperm) down the style where they unite with the ovules, in the ovary, the fruit is set.

Hybrid pollination

- 1 Cross pollination is accomplished by removing the anthers of parent X before pollen is released . . .
2. The Y-parent's anther tube is opened up when pollen is present. The pollen is picked up with a soft brush and . . .
3. Deposited on the stigma of parent X.

The seeds from the resulting tomato have characteristics of both X and Y.

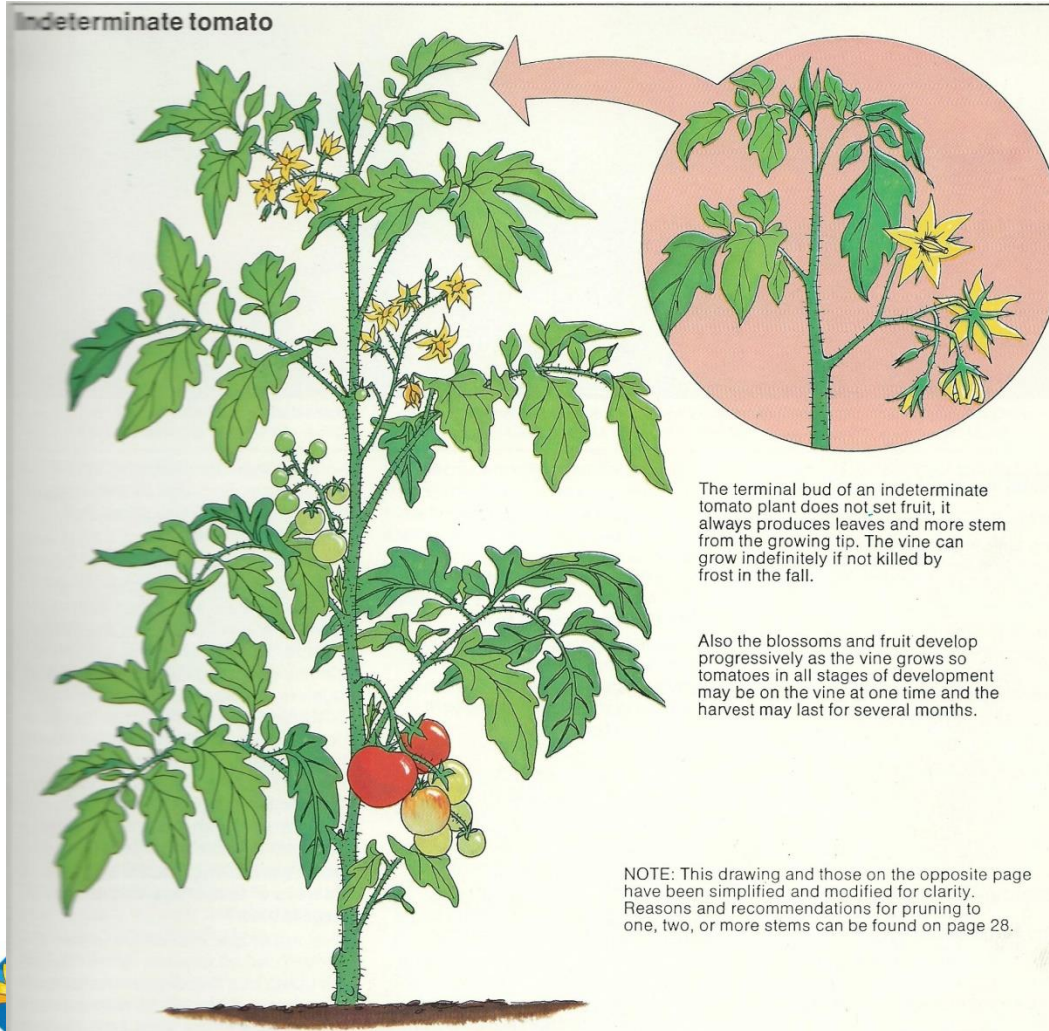


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Determinate vs. Indeterminate



The terminal bud of an indeterminate tomato plant does not set fruit, it always produces leaves and more stem from the growing tip. The vine can grow indefinitely if not killed by frost in the fall.

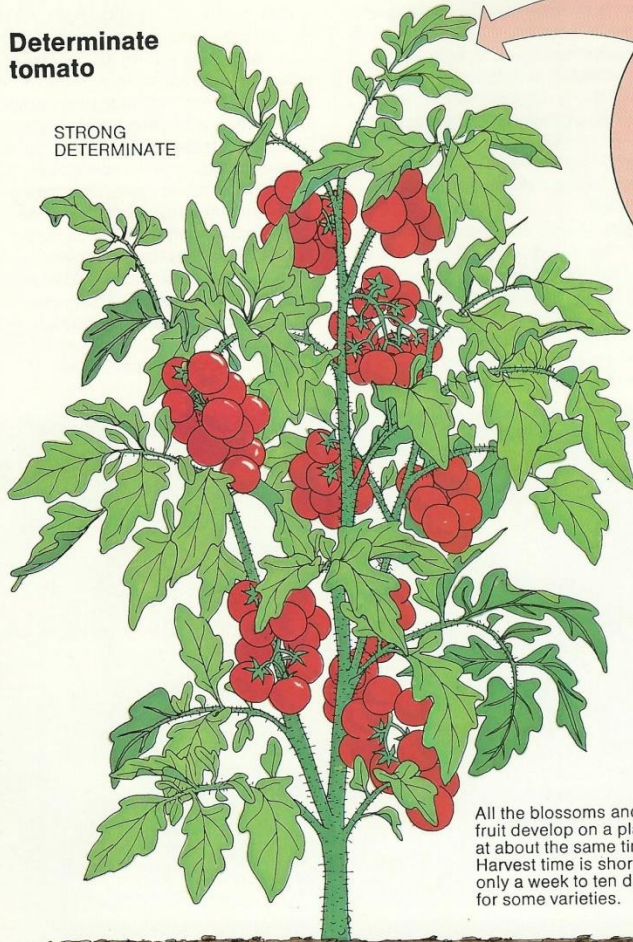
Also the blossoms and fruit develop progressively as the vine grows so tomatoes in all stages of development may be on the vine at one time and the harvest may last for several months.

NOTE: This drawing and those on the opposite page have been simplified and modified for clarity. Reasons and recommendations for pruning to one, two, or more stems can be found on page 28.

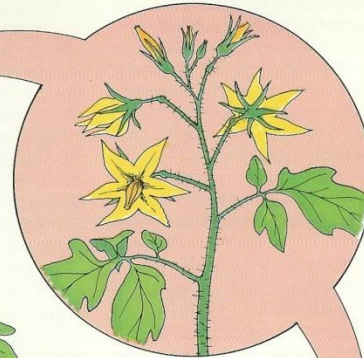
Determinate vs. Indeterminate

Determinate tomato

STRONG DETERMINATE

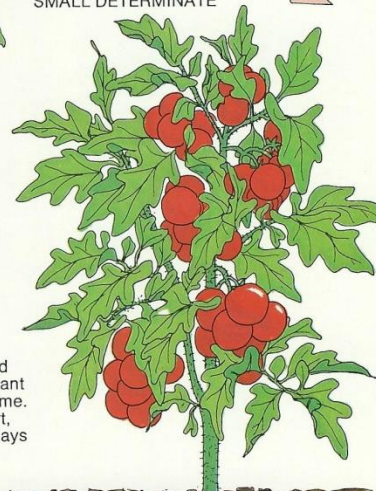


All the blossoms and fruit develop on a plant at about the same time. Harvest time is short, only a week to ten days for some varieties.



Terminal buds do not set fruit; stop stem growth. The plant is self-topping and seldom needs staking.

SMALL DETERMINATE



Starting from Seed

Work backward from anticipated planting date

Use seed starting mix – not potting soil

Moisten soil and gently tamp

Place seeds in cells, blocks, or open flats

Cover lightly – read seed package!

Provide warmth

Cover with dome or plastic to retain moisture

Keep a log of what you plant!

Work slowly and carefully



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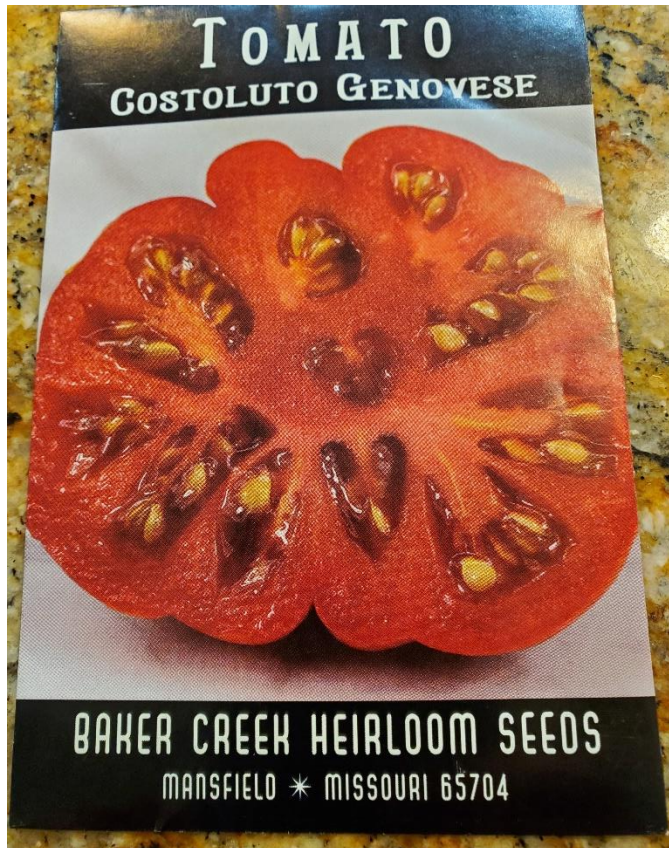


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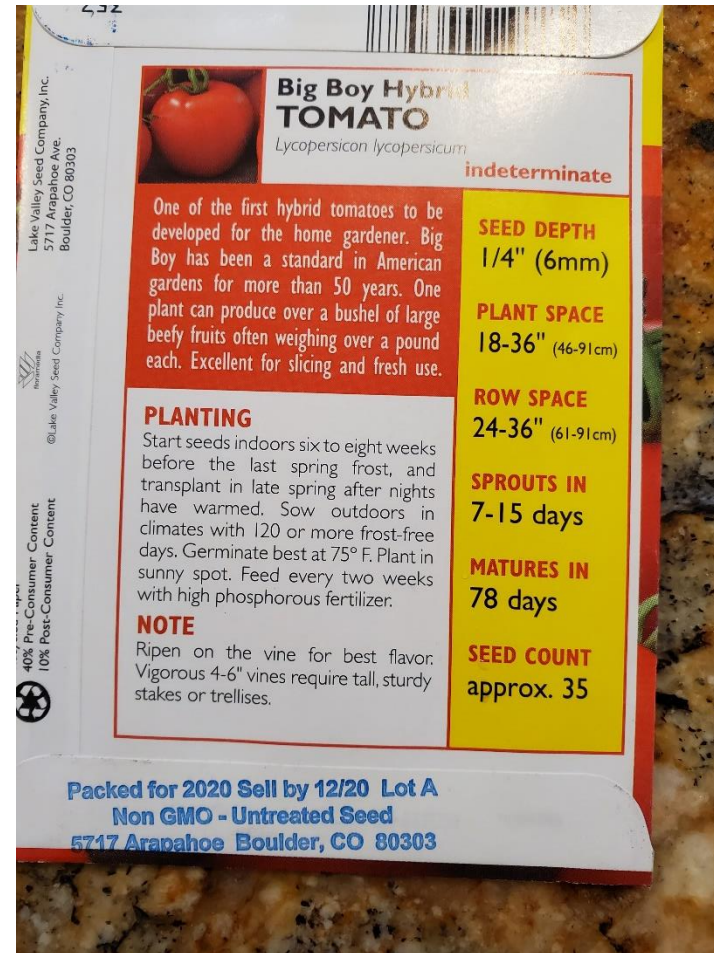
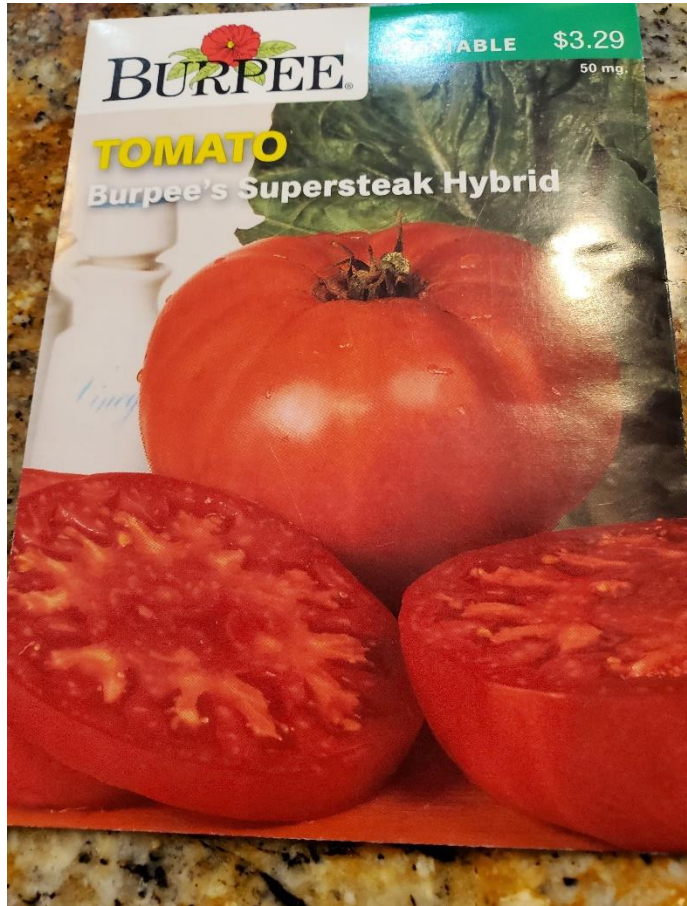
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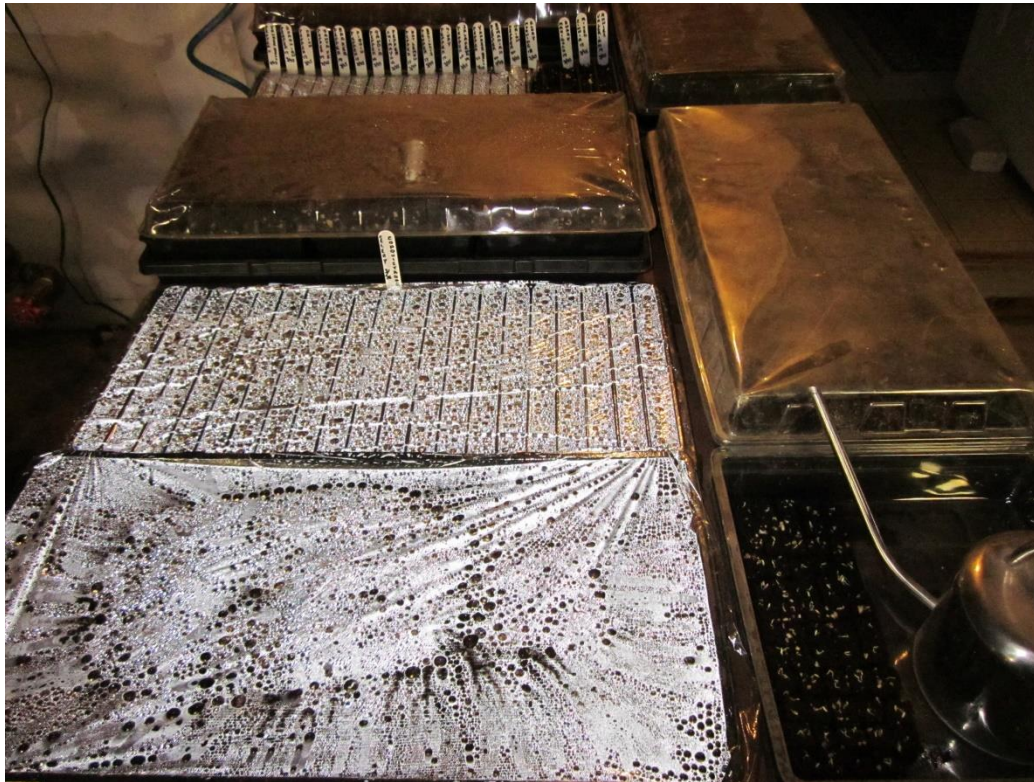
Read your Seed Packet



Read you Seed Packet



Starting from Seed



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Starting from Seed



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They've Started to Sprout!



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They've Started to Sprout!

Remove dome to prevent damping off

Provide light 12 hrs./day if possible

Fertilize after true leaves appear

“Pot up” as needed to avoid root binding

Maintain proper moisture



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They've Started to Sprout!



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They've Started to Sprout!



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Planting Out

Hardening off

Preparing the bed - Compost

Spacing

Deep Planting

Support

Mulch

Watering

Fertilizing

Pruning



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Hardening Off



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Hardening Off

Start Slowly: for the first day set outside in the shade next to the house. Bring them in at night.

Raise Exposure gradually

Monitor seedlings

Finally leave outside when the forecast is to be above 50 degrees F overnight.



Preparing the Bed



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Planting Deep



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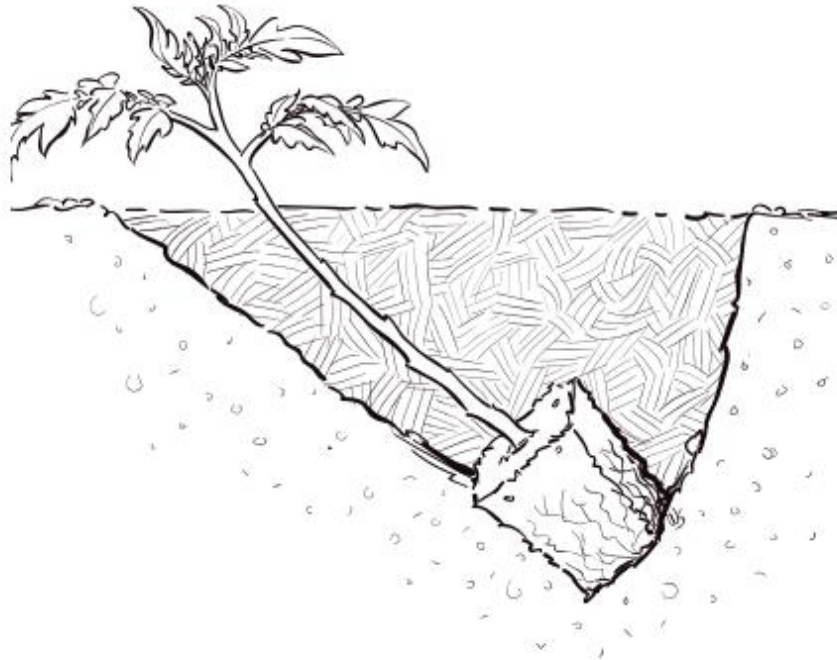


Figure 1. Set tall, lanky tomato plants horizontally into the soil with just a few leaves above the ground. Illustration by Will Suckow.



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Plant Deep to increase roots



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Spacing



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Support - Trellis



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Support - Cage



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Support - Skywire

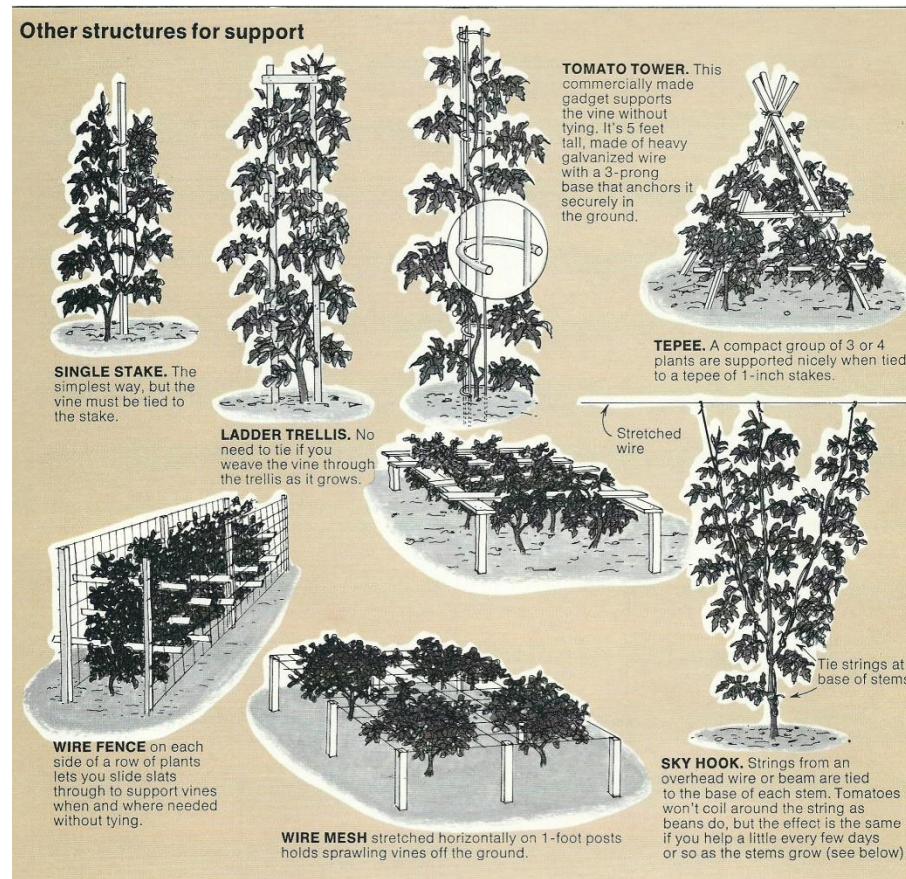


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Support – Stakes and More



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Mulch



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Other Considerations

PH of soil

- ❖ tomatoes prefer ph from 6.0-7.0

Location and orientation of bed

- ❖ east/west with at least 6-8 hours of sun
- ❖ avoid cold micro-climates

Crop rotation

- ❖ 3-year rotation is good
- ❖ don't follow plants from the same family (eggplant, peppers, potatoes)

Access to water



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Pruning your tomatoes

Pruning is not always necessary. However, when pruning your tomatoes, remember these main points:

Plants with two or more stems produce more tomatoes with better foliage protection from the sun than plants with one stem. However, tomatoes pruned to one leader will bear earlier but with less yield overall. Choose the stems you want to keep and pinch out the others as they develop.

Severe pruning to one stem will reduce your total crop greatly and also is likely to increase the incidence of some diseases or disorders.

Before removing suckers or side shoots on a tomato plant, wait until two leaves develop and pinch above them.



This shoot too young to prune



Pests and Problems

Vertebrate Pests

Insects

Diseases/Environmental
problems



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Vertebrate Pests



liforn

ral Resources

Dr. Floyd Glenn Ingles @ California Academy of Sciences

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INSECTS

The Dreaded Hornworm!



Signs of Invasion



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We Have an Ally!

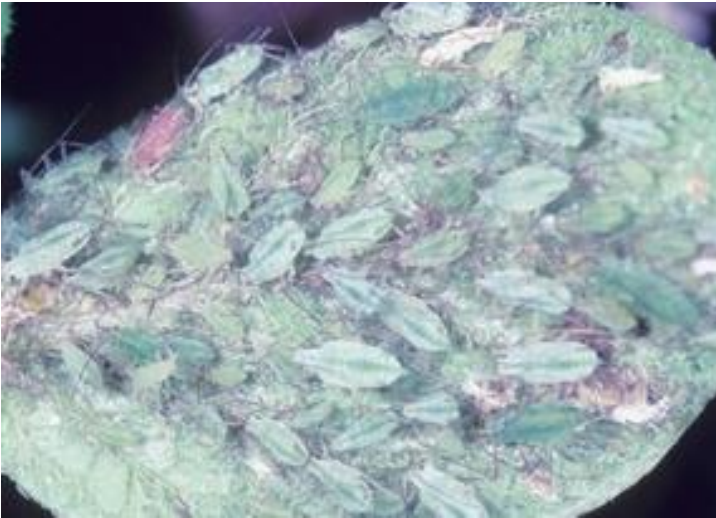
The Brachonid Wasp



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Other Common Tomato Pests



POTATO APHID



THRIPS



FLEA BEETLES



WHITEFLIES

Insect Pest	Natural, Less Toxic Insecticides
Aphids	insecticidal soap neem oil extract
Tomato Fruitworms & Hornworms	<i>Bacillus thuringiensis (B.t.)</i> spinosad pyrethrin neem oil extract
Flea Beetles	insecticidal soap neem oil extract horticultural oil pyrethrin
Whiteflies	insecticidal soap neem oil extract pyrethrin horticultural oil

Tomato Diseases

Bacterial

Fungal

Viral

Environmental



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Tomato Diseases

Bacterial

- Bact. speck
- Bact. wilt
- Bact. canker
- Bact. Spot

■ Environmental

- Blossom end rot
- Sunscald

● Fungal

- Grey leaf spot
- Early blight
- Late blight
- Tomato leaf mold
- Powdery mildew
- Fusarium
- Verticillium
- Stem canker
- Damping off

● Viral

- Tobacco mosaic virus
- Apex necrosis virus
- Yellow leaf curl virus
- Spotted wilt virus
- Pepino mosaic virus
- Cucumber mosaic virus



Tomato Diseases

Verticillium and Fusarium wilt

Tobacco mosaic virus

Damping off

Powdery Mildew

Blossom end rot

Sunscald



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Fungus and Virus Diseases – **NO CURE!!**



VERTICILLIUM WILT



FUSARIUM WILT



TOBACCO MOSAIC VIRUS

**EITHER PLANT RESISTANT VARIETIES OR MAKE SURE TO KEEP YOUR SOIL HEALTHY.
REMOVE DEBRIS, SOLARIZE BEFORE PLANTING, ETC ?**



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Damping Off



SPORES ARE PRESENT IN ALL SOILS. USE STERILIZED SEED STARTING SOIL INDOORS. FAST GROWING SEEDS IN WARM SOIL ARE LESS SUSCEPTIBLE.



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Powdery Mildew



BEST TO PREVENT RATHER THAN CURE.

AIR CIRCULATION, DRY LEAVES, FULL SUN, RESISTANT VARIETIES. CATCH EARLY WITH OIL, SULFUR, SERENADE.



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80

OPEN POLLINATED • DAYS TO MATURITY • MEDIUM SLIC
VF & LATE BLIGHT • INDETERMINATE

... are borne on long trusses for seasons long harvests of exceptional quality, superb orange color and the sweetest tomato flavor. Harvest them in baskets to show off on the kitchen counter for "bet you can't just eat just one" snacks of eye-catching beauty. Indeterminate Sungold vines are vigorous, early to bear, crack resistant and resistant to Fusarium, Verticillium, and TMV. They will be your favorite fresh from the garden treat.



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Blossom End Rot



Blossom end rot results from a low level of calcium in the fruit and water balance problem in the plant.



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Sun Scald

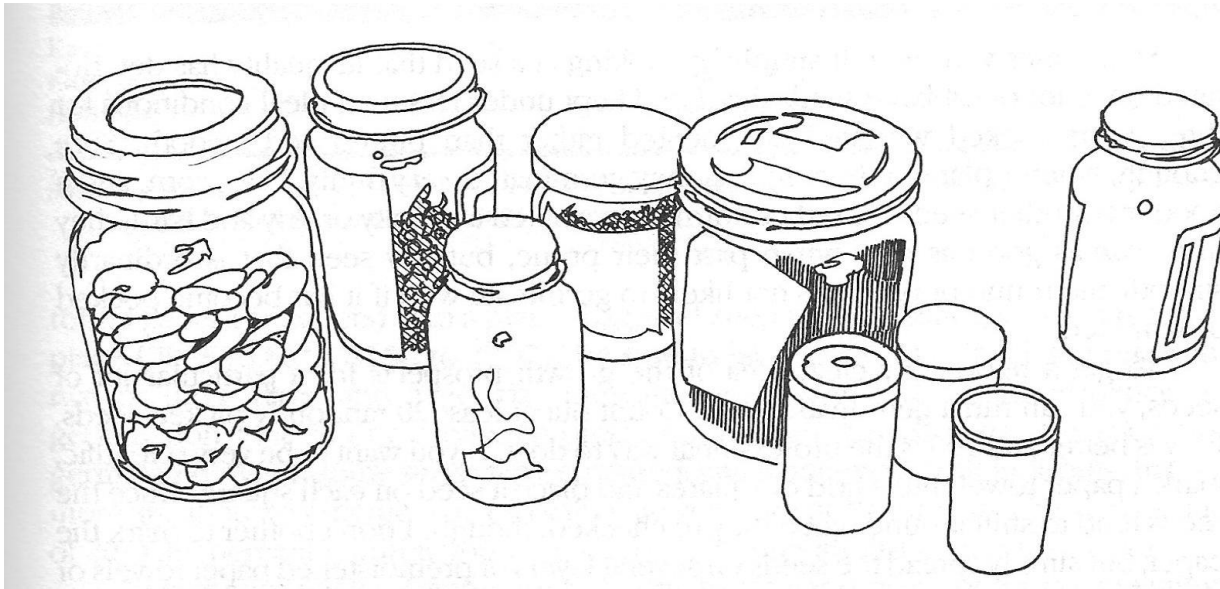


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Saving Seeds



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Our Favorites!

Black Krim



Limmony



San Marzano



Brandywine



Cherokee Purple



Sun Gold



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More Prize Winners!

Black Cherry



Jasper



San Pierre



Kellogg's Breakfast



Mortgage Lifter



Pink Berkeley Tie Dye



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Why We Like Them!



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Why We Like Them!



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Why We Like Them!



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TOMATOES IN THE HOME GARDEN

**Publication
Number
31-159**

EDITED & ADAPTED BY **Cindy Fake**, Horticulture & Small Farms Advisor, Placer & Nevada Counties, *FROM* *Pests of the Garden and Small Farm*, **M. L. Flint**; *Tomato (*Lycopersicon esculentum*)*, **M. Ratliff, H. Bale, et al.**; & *Tomatoes*, **D. Pittenger**.

(revised August
2003)

HISTORY

Tomatoes are native to tropical America and were introduced to European gardens in the 16th century. They were originally grown as an ornamental known as the love-apple and were thought to be poisonous. In the last century, they have become one of the most popular home garden vegetables.

TOMATO VARIETIES

There are about 400 tomato varieties available commercially, with a broad range of sizes, colors, flavors and maturity dates. Remember that the date of maturity on the package reflects days after transplanting, not seeding. Nurseries and mail order catalogs provide a wide selection of seeds.

Look for the letters **V, F, N** on the seed packet or plant label as

Nurseries and garden centers are a good source for transplants, but varieties are limited. Choose sturdy, thick-stemmed, dark green plants that are six to eight inches tall, without flowers.

CULTURE

Tomatoes are warm season plants that require a minimum of three frost-free growing months. Optimum growing temperatures are between 65 and 90° F. Below 55°F and above 95°F, they may not set fruit. In areas where summer nights are cool, choose early maturing varieties.

Tomatoes respond to soils enriched by compost or other organic material. They have only moderate nitrogen needs, and high nitrogen levels will cause lush growth of foliage and stems at the expense of flowering and fruit production. At fruit set,

determinate varieties. Avoid large fluctuations in soil moisture, however, to reduce blossom-end rot and fruit cracks.

Blossom-end rot, which is characterized by a sunken, leathery, dark spot on the bottom of the fruit, is associated with fluctuations in soil moisture and calcium deficiency in the fruit. It is more common in larger fruits and Roma type tomatoes.

GROWTH HABITS

Tomatoes exhibit two growth habits: determinate and indeterminate. **Determinate** tomato varieties grow to a certain size (*usually three to five feet*), then flower and set fruit. They bear fruit all at once and then decline. Grow this type if you have a short growing season or if you want your tomatoes all at one time. Most of the early ripening





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<http://anrcatalog.ucdavis.edu>



PUBLICATION 8159

Growing Tomatoes in the Home Garden

DENNIS R. PITTENGER, University of California Cooperative Extension Area Horticulture Advisor; **NANCY F. GARRISON**, University of California Cooperative Extension Horticultural Advisor, Santa Clara County; **PAMELA M. GEISEL**, University of California Cooperative Extension Landscape and Turf Management Farm Advisor, Fresno County; **CAROLYN L. UNRUH**, staff writer, University of California Cooperative Extension, Fresno County

Tomatoes are among the most popular vegetables grown in home gardens. They also prompt frequent cultural and pest management questions, though many problems can be avoided by planting disease-resistant varieties that are well adapted for your growing area. Most tomato varieties available to the home gardener produce flavorful and juicy fruit and require relatively little space for a large yield. When properly cared for, each tomato plant can bear 10 to 15 pounds (4.5 to 6.8 kg) or more of fruit.

Deciding which tomato variety to plant may seem a difficult task, given the large number that are available and the differences in size, habit, and climatic requirements. In addition to the usual round red tomato, home gardeners can choose to grow orange, yellow, pink, or striped tomato varieties, or those shaped like pears, grapes, or plums. Often these unusual varieties are available only to the home market and may be grown on limited acreage as they may have little commercial appeal. Some yellow tomatoes have a mild, sweet flavor with low acid content. Ask gardening friends and neighbors for the names of their favorites, and don't overlook the heirloom varieties that are also available.

Tomatoes are described as determinate or indeterminate based on the plant's growth habit. Determinate, or "bush," tomato plants have a somewhat bushy appearance, grow to a given size, about 3 to 5 feet (0.9 to 1.5 m), bear most of their fruit within about 4 to 6 weeks, and then decline in vigor. Most early-ripening and canning

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ASK A MASTER GARDENER

HARVESTING SEEDS FROM THE GARDEN

By Trish Grenfell, Placer County Master Gardener

Q I am wondering if I can save money next year by using seeds from my current garden plants.

A The frugal gardener should be outside searching plants that are going to seed. That's right, the seeds are sitting right in front of us, waiting to be harvested!

As wonderful as this may seem, you do take a risk when you use these harvested seeds rather than those you purchase. Your garden seeds are the result of random, open pollination by bees and other insects or other natural agents (birds butterflies) and may not produce plants identical to their parents (i.e., hybrid varieties). Purchased seeds are guaranteed to have the desirable traits of the specific, selected parent plants from which they were bred. Self-pollinating plants (i.e., tomatoes) offer the best opportunity for a home gardener to save seed, because the pollen is transferred directly to the stigma within the flower, but even that is not fool proof. That said, you certainly can't beat the price, and the adventure can add to the fun.

If left alone, the seeds will dry and drop around the original plant. (If you have a self-seeding plant, you can let them seed on their own. It may get a bit crowded, but you can dig up the 'babies' and replant them.) When you want to collect the seeds, don't remove the spent flowers. Instead, let nature take its course, and keep an eye out for seedpod development. One removal method is to wait until the plant is brown and then just "shake" the seeds out, but a more efficient method is to snip the old flowers/fruit. Different plants produce seed in different forms. Sometimes they're encased in fruit and can be collected when the fruit is allowed to dry (collect from very ripe but not rotting fruit). Non-fruit seeds develop in a papery pod after the bloom fades. Seed heads need to be collected before these pods naturally release the seed. Note: do not harvest seeds on a wet day.



References

HANDOUTS

Fake, Cindy. *Tomatoes in the Home Garden*. UCCE Placer/Nevada Publication 31-159. rev. 2003.

Pittenger, Dennis. *Growing Tomatoes in the Home Garden*, UCCE Publication 8158, rev. 2005

RESOURCE LINKS

<http://ucanr.edu/sites/placervevadasmallfarms/files/63813.pdf>

[Managing Pests in Gardens: Vegetables: Tomato \(ucanr.edu\)](http://ucanr.edu/sites/placervevadasmallfarms/files/63813.pdf)

[Growing Vegetables in Placer County - UC Master Gardeners of Placer County \(ucanr.org\)](http://ucanr.org)

BOOKS

[California Master Gardener Handbook](#). Second Edition, UCANR Publication 3382



Thank You!

Any Questions?

Master Gardener Hotline: **(530) 889-7388**

Master Gardener Website: **pcmg.ucanr.org**

Evaluations, please!



UC Master Gardeners of Placer County

Evaluations

Please help us improve our programs by filling out an evaluation at the end of the workshop.

Thanks for coming!



UCCE MASTER GARDENERS WORKSHOP EVALUATION

Date				
Workshop Name	Not at all	Somewhat	Very	Absolutely
1. Did this workshop meet your expectations?				
2. Did you have prior knowledge of the subject?				
3. Was your understanding of the subject enhanced by this presentation?				
4. Were you taught to find additional information on your own?				
5. Will you make use of this newly acquired knowledge?				
6. Will you recommend M.G. Workshops to others?				
7. Are you likely to attend other workshops?				
8. How did you hear about our workshops? (circle)	Radio	Calendar	Friend/relative.	Newspaper
	Attended other workshops		Other.	
9. What additional topics would you like covered in future workshops?				
10. Comments.				

