



Tomato Growing Basics

Grades 3-5

Master Gardeners

The University of California Cooperative Extension (UCCE) Master Gardener Program (MGP) is an educational program designed to teach and effectively extend information to address home gardening and non-commercial horticulture needs in California.

UCCE is the outreach arm of UC's division of Agriculture and Natural Resources (ANR). Master Gardener volunteers (MG volunteers) promote the application of basic environmentally appropriate horticultural practices through UCCE-organized educational programs that transfer research-based knowledge and information.



University of California

Agriculture and Natural Resources

UCCE Master Gardener Program

Learning Goal

Learn the basics of successfully growing tomatoes and the specifics of growing Roma tomatoes.



Is a tomato a fruit or vegetable?

- A tomato is a fruit because it has seeds (see image)
- People often use tomatoes in the same way they use vegetables:
 - In salads
 - In sauces
 - As a side dish to a main course
 - In casseroles and pasta dishes



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Tomatoes Grow from Flowers

All tomatoes grow from flowers on the tomato plant.



Two Types of Tomatoes

There are countless varieties of tomatoes, but they all fall into one of two categories: Determinate and Indeterminate

Determinate

- This type of tomato stops growing at a set height of about 3-5' and will bear most fruit within a 4-to-6-week period.
- These early ripening types may be best for containers.

Indeterminate

- This type of tomato continues to grow and set fruit all summer until killed by frost or disease.
- Many of the commonly grown larger fruited varieties are indeterminate.

Selecting a Variety to Grow: Roma Tomatoes

- Determinate
- Oblong in shape
- Thicker fruit wall
- Fewer seeds
- Firmer than other varieties
- Best when cooked



Best Time of Year to Grow Tomatoes

- Tomatoes are a warm season plant.
 - They need 6 to 8 hours of sun each day
- You can prevent diseases by planting seedlings when the weather is warmer.
- If you plant early in the season during cooler weather, you may need to protect the plants from frost.
 - You can cover plants with plastic jugs for protection



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Here are some handy temperature tips!

- **100°F:** flowers will not [set](#)
- **80° – 90°F:** optimum growth
- **70° – 80°F:** optimum germination
- **50° – 55°F:** minimum night temperature for fruit set
- **45°F:** will grow slowly
- **32°F:** potential frost injury



Preparing Soil for Planting – Garden Bed

Garden Bed

- The annual addition of aged organic matter to your soil will improve plant nutrition and improve moisture retention.
- Dig compost into the top foot of soil and allow it to sit for at least a week before planting.



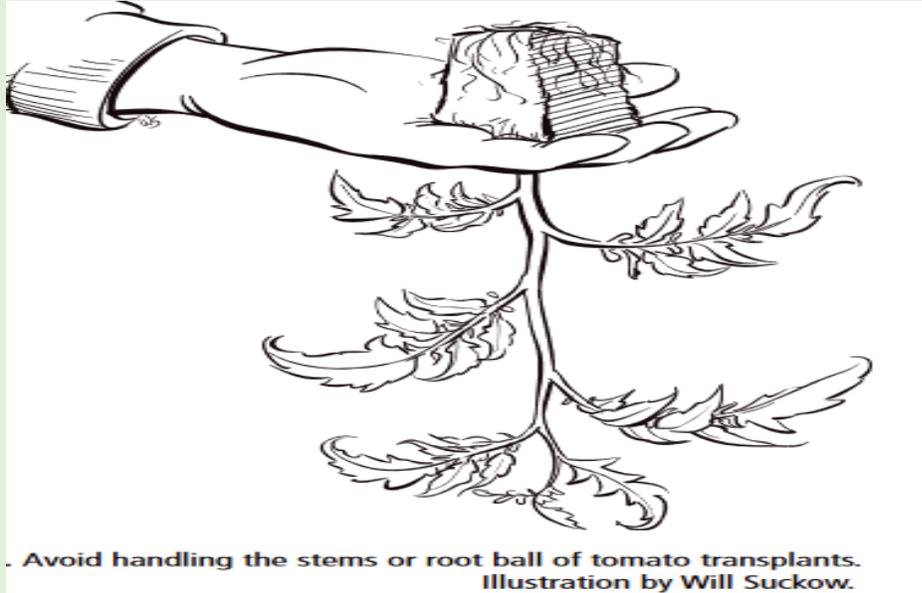
Preparing Soil for Planting - Containers



Container

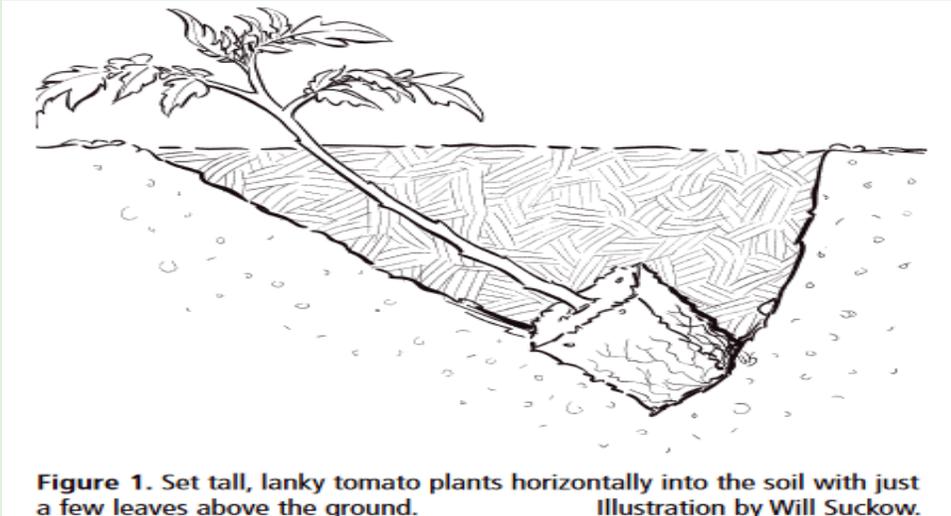
- You can make your own container mix by combining equal parts of compost, coconut coir and vermiculite or perlite.
 - Coir is sold in a compressed form and will expand in volume when soaked in water.
- Or you can purchase potting soil for vegetables!
- The soil depth of the container must be a minimum of 16”.

Step 1: How To Transplant a Tomato Seedling



- Ease the plant out of the pot before transplanting and gently loosen the roots somewhat.
- Avoid handling the stems or root ball of tomato transplants

Step 2: How to Transplant a Tomato Seedling



- Tall tomato transplants can be planted deeply if you pinch off the lower leaves.
- Roots will form along the buried portion of the stem giving better growth and less chance of injury from a stem that is too weak.
- Lanky young plants can be buried right up to the first leaves, or even horizontally in the ground.

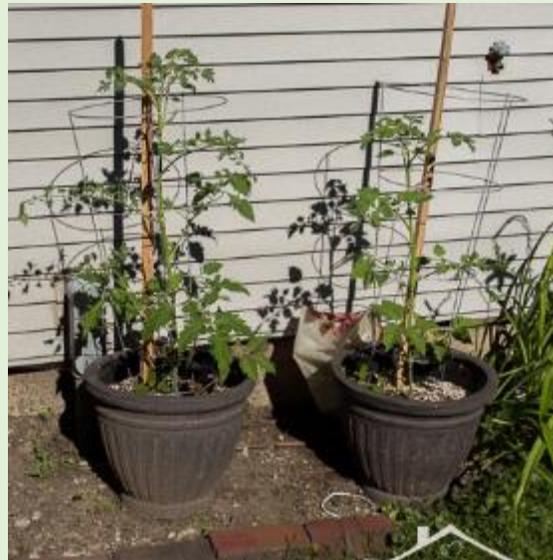
Transplanting your Seedling, Continued

- Press soil gently around each transplant so that a slight depression is formed for holding water.
- Water thoroughly to settle the soil and eliminate any air pockets around the roots.
 - You may need to press the soil in place again after watering.
- Insert a cage or trellis that will provide support throughout the plant's growth.



Tomato Plants Need Support

- All types of tomatoes need a strong support such as a trellis, cage or stakes to keep plants upright. This will save space and allow easy harvesting.
- The support will keep the tomato fruit off the ground and reduce pests or diseases.

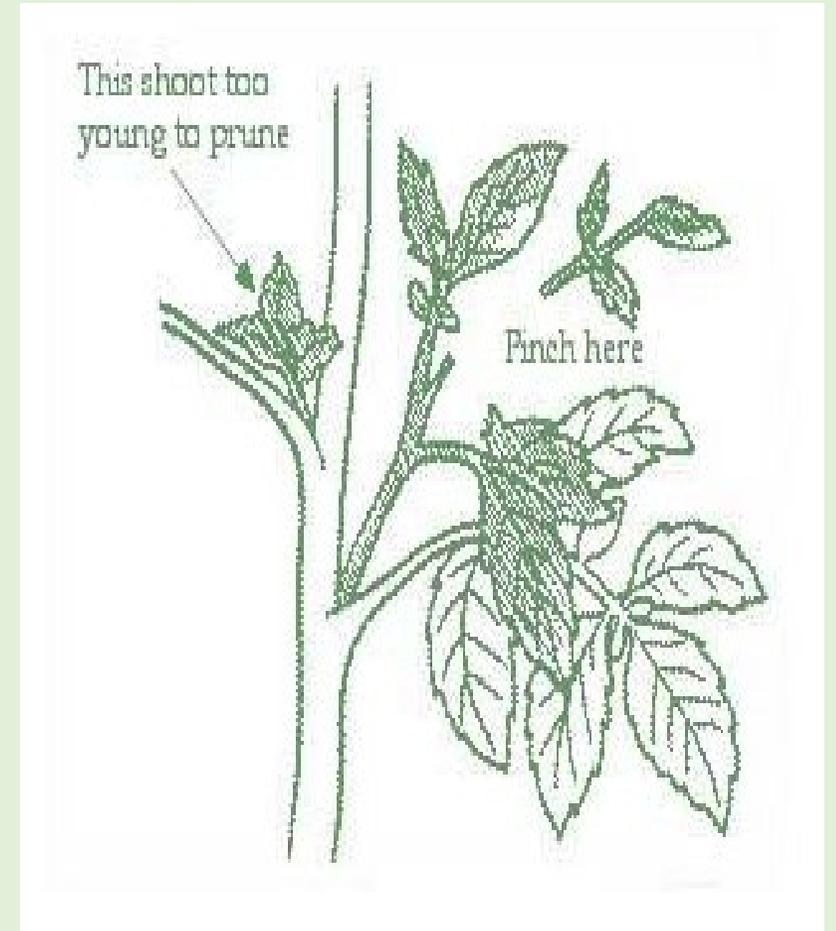


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Pruning Tomatoes

Definition: trim (a tree, shrub, or bush) by cutting away dead or overgrown branches or stems, especially to increase fruit and growth.

- Determinate tomatoes do not require heavy pruning or sucker removal for good crop yield.
- Plants with two or more stems produce more tomatoes with better foliage protection from the sun than plants with one stem.
- It is safe to remove yellow and brown leaves from the base of the plant.



Watering

Tomatoes need regular watering during the growing season.

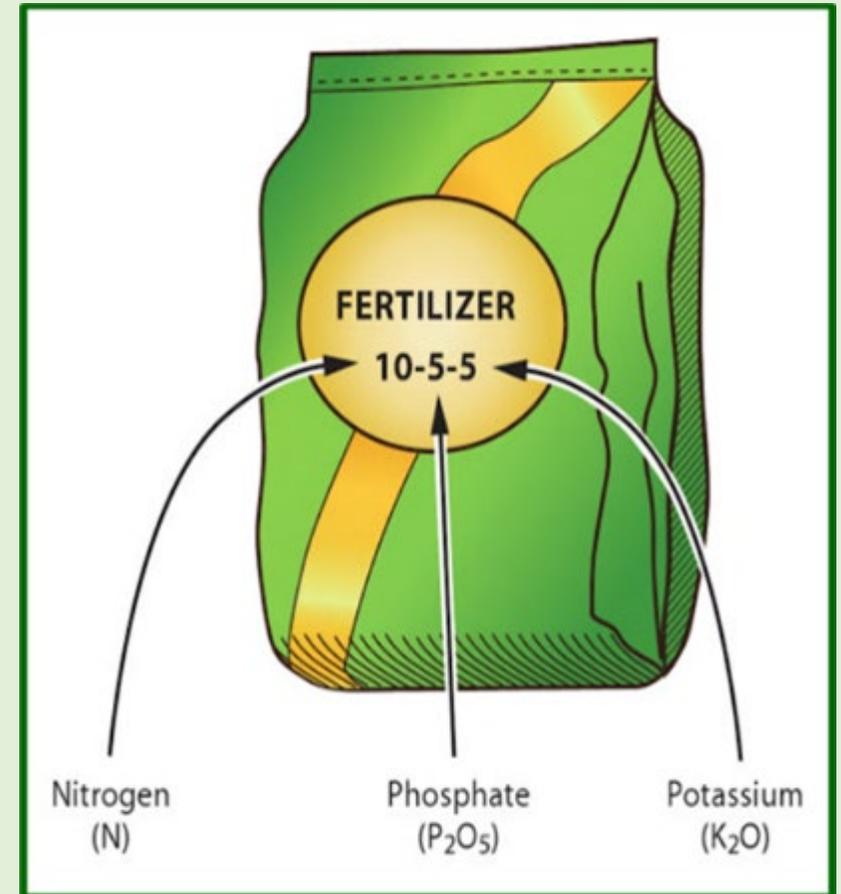
- Keep the soil moist around new plants for the first 3-4 weeks. Water established plants when the soil is dry to about 2-3”.
- Use mulch around plants to reduce the loss of moisture.
- Avoid wetting the leaves or fruit with overhead watering.
- Avoid extreme fluctuations in moisture as this can increase the incidence of fruit cracking and blossom-end rot.



Fertilizing

Healthy, vigorous plants should not require extra fertilizer until they have set fruit.

- After plants have set fruit, you may want to fertilize with a balanced fertilizer every 4 to 6 weeks.
- Follow label directions and avoid over-fertilizing.



Disease: Blossom-End Rot

This is a common disorder seen on Roma or other elongated tomatoes.

- You'll recognize the symptoms when you see fruit with an ugly brown sunken circle on one end.
- This condition can be caused by extreme changes in water supply and/or too much nitrogen fertilizer.
- To avoid this problem, provide regular deep watering and always use a fertilizer with balanced amount of nitrogen and phosphorus.



Pest: Hornworm

The hornworm (caterpillar) will eat all parts of the tomato plant including the fruit.

- Handpick or snip hornworms with shears.
- Natural enemies normally keep populations under control.
 - This includes ladybugs and lacewings.
- Less toxic pesticides are [*Bacillus thuringiensis*](#) (B.t.) or [*spinosad*](#) are effective.



Harvesting Tomatoes

Don't leave ripe fruit on the vines longer than necessary.

- Generally, it is best to harvest red ripe fruit and store it at room temperature.
- To extend the season, green fruit can remain on the plant if temperatures are above 50° F most of the time. When the tomatoes start to color, select the best to ripen indoors.
 - Store them at 70° F to ripen
 - Move to cooler temperatures when they turn pink (55° F)



Video: How to Grow Tomatoes

- Click Here: [How to Grow Tomatoes from a Tomato](#)



How to grow tomatoes? 14 days in one minute time lapse

Science Vocabulary

- **Organic Matter:** Soil **organic matter** is the fraction of the soil that consists of plant or animal tissue in various stages of breakdown.
- **Compost:** Mixture of organic matter, as from leaves and manure, that has decayed or has been digested by organisms, used to improve soil structure and provide nutrients.
- **Mulch:** A protective covering (as of sawdust, compost, or paper) spread or left on the ground to reduce evaporation, maintain even soil temperature, prevent erosion, control weeds, enrich the soil, or keep fruit clean.
- **Larva:** Stage in the development of many animals, occurring after birth or hatching and before the adult form is reached.

Review Questions

- Is a tomato a vegetable or a fruit? Why is it a fruit?
- Name three (3) characteristics of a Roma tomato.
- From what part of the plant do tomatoes grow?
- What is the best time of year to grow a tomato? How many hours of sun does the plant need per day?
- Why do tomato plants need support, such as a cage or trellis?
- What is a pest that likes to eat tomato plants? How can you discourage this pest from eating your plants?
- What is the best time to harvest tomatoes?

Activity: What Vegetables are on a Pizza?

You can use Roma tomatoes to make sauce to go on a pizza. What other vegetables from the garden can top a pizza? Write your answer on a piece of paper.

You could grow a pizza garden!



Extension: Homemade Fresh Tomato Sauce

Cook with an Adult!!



- **Ingredients**

- 5-8 very ripe tomatoes (plum, roma, round etc.)
- 1-2 cloves garlic (chopped or minced)
- 1 - 1 1/2 teaspoons oregano
- 1/4-1/2 teaspoon salt
- 6-8 leaves fresh basil chopped
- 3 tablespoons olive oil
- hot pepper flakes to taste
- 3 cups cooked pasta (we prefer short pasta for this sauce)

Extension: Homemade Fresh Tomato Sauce

Instructions

Cook with an Adult!!

- Wash tomatoes and place in a large bowl, cover with boiling water and let sit for approximately 10 minutes (should be easy to remove the skin, be careful because it is very hot). Remove skin and squeeze out excess water, remove seeds and any white or yellow flesh, cut into small pieces.
- In a medium-sized high sided frying pan add olive oil, tomatoes, garlic, oregano, salt, fresh chopped basil leaves and hot pepper flakes if desired .
- Mix together and then squish gently with a fork, cook uncovered on medium heat till thickened. Simmer for approximately 20 - 25 minutes.
- While sauce is cooking boil the water, add salt and cook pasta al dente.
- Add 3 cups of cooked short pasta and 1/2 ladle of pasta water, heat on medium/high heat for a couple of minutes gently tossing. Serve with grated Parmesan Cheese.

Homemade Fresh Tomato Sauce

- **Nutrition**

- Calories: 251kcal | Carbohydrates: 31g | Protein: 6g | Fat: 12g | Saturated Fat: 2g | Sodium: 151mg | Potassium: 238mg | Fiber: 3g | Sugar: 3g | Vitamin A: 705IU | Vitamin C: 10.9mg | Calcium: 34mg | Iron: 1.9mg

- *Homemade Fresh Tomato Sauce <https://anitalianinmykitchen.com/fresh-tomato-sauce/>*

Next Generation Science Standards

- 3rd Grade

LS1.B: Growth and Development of Organisms

Reproduction is essential to the continued existence of every kind of organism. Plants and animals have unique and diverse life cycles. (3-LS1-1)

LS3.B: Variation of Traits

Different organisms vary in how they look and function because they have different inherited information. (3-LS3-1)

The environment also affects the traits that an organism develops. (3-LS3-2)

LS2.C: Ecosystem Dynamics, Functioning, and Resilience

When the environment changes in ways that affect a place's physical characteristics, temperature, or availability of resources, some organisms survive and reproduce.

Next Generation Science Standards (Continued)

- 4th Grade

LS1.A: Structure and Function

Plants and animals have both internal and external structures that serve various functions in growth, survival, behavior, and reproduction. (4-LS1-1)

- 5th Grade

LS1.C: Organization for Matter and Energy Flow in Organisms

Plants acquire their material for growth chiefly from air and water. (5-LS1-1)

LS2.A: Interdependent Relationships in Ecosystems

The food of almost any kind of animal can be traced back to plants.

LS2.B: Cycles of Matter and Energy Transfer in Ecosystems

Matter cycles between the air and soil and among plants, animals, and microbes as these organisms live and die. Organisms obtain gases, and water, from the environment, and release waste matter (gas, liquid, or solid) back into the environment. (5-LS2-1)

Resources

- Integrated Pest Management: <http://ipm.ucanr.edu/home-and-landscape/tomato/cultural-tips/>
- Food Gardening: University of California Agriculture and Natural Resources https://ucanr.edu/sites/mgfresno/FOOD_GARDENING_775/Tomatoes_319/
- Planting and Growing Tips: University of California Agriculture and Natural Resources <https://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=30015>
- Tomato Basics for New Gardeners, Master Gardeners, <https://ucanr.edu/blogs/blogcore/postdetail.cfm?postnum=41278>

Resources

- Tomato Pruning: University of California Agriculture and Natural Resources
https://ucanr.edu/sites/ucmgnapa/TomatoInfo/Tomato_Pruning/
- World Tomato Society:
<https://www.worldtomatosociety.com/tomato/camp-joy/>
- **Images:** Creative Commons, Stock Images, UCANR, Savvy Gardening
- Video: Nature Lapse: https://www.youtube.com/watch?v=JvGDx1_wxKY

Gardening Questions?

- Email or Call the UCCE Master Gardeners of Riverside County
- Email Helpline
 - anrmgriverside@ucanr.edu
- [Riverside Master Gardeners Website](#)
- E-mail: mgschoolgardens@gmail.com



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