Welcome!

UC Master Gardeners

Who we are:

Volunteers

Part of the University of California Cooperative Extension program

80 hours of initial training, yearly CE to continue certification

UC Master Gardeners

What we do:

Provide scientifically-based gardening info

Workshops, Help Desk, Farmers Markets, Mobile Help Desk

Newspaper, Facebook, Tree Book, Monthly Garden Guide

UC Master Gardeners

More of what we do:

Website

Train future Master Gardeners

Tomato Sale—April 23, 2016

Garden Tour—Late spring 2017

UC MG Demo Garden

It’s Almost Time for Tomatoes!

Growing Tomatoes in the Home Garden

Brought to you by Mother Nature
Your good gardening skills, and
UC Master Gardeners of Napa County

All About Today—April 10

Varieties—Rachelle Benney and Team

Planting—Connie Wilson

Cultivation—Suzan Rada

Sanitation—Gayle Nelson

Harvest & Maturity—David Layland

All About Today—April 16

Varieties—TomatoTeam

Planting—Cindy Panek

Cultivation—John Pearson

Sanitation—Gayle Nelson

Harvest & Maturity—David Layland

Choosing the Right Tomato

Growth Habit - Determinate or indeterminate

Heirloom or hybrid

Maturity – early, mid, late season

Purpose – slice, juice, can, dehydrate

Size, shape, and color

Selecting seedlings

Disease resistance – applies only to hybrids

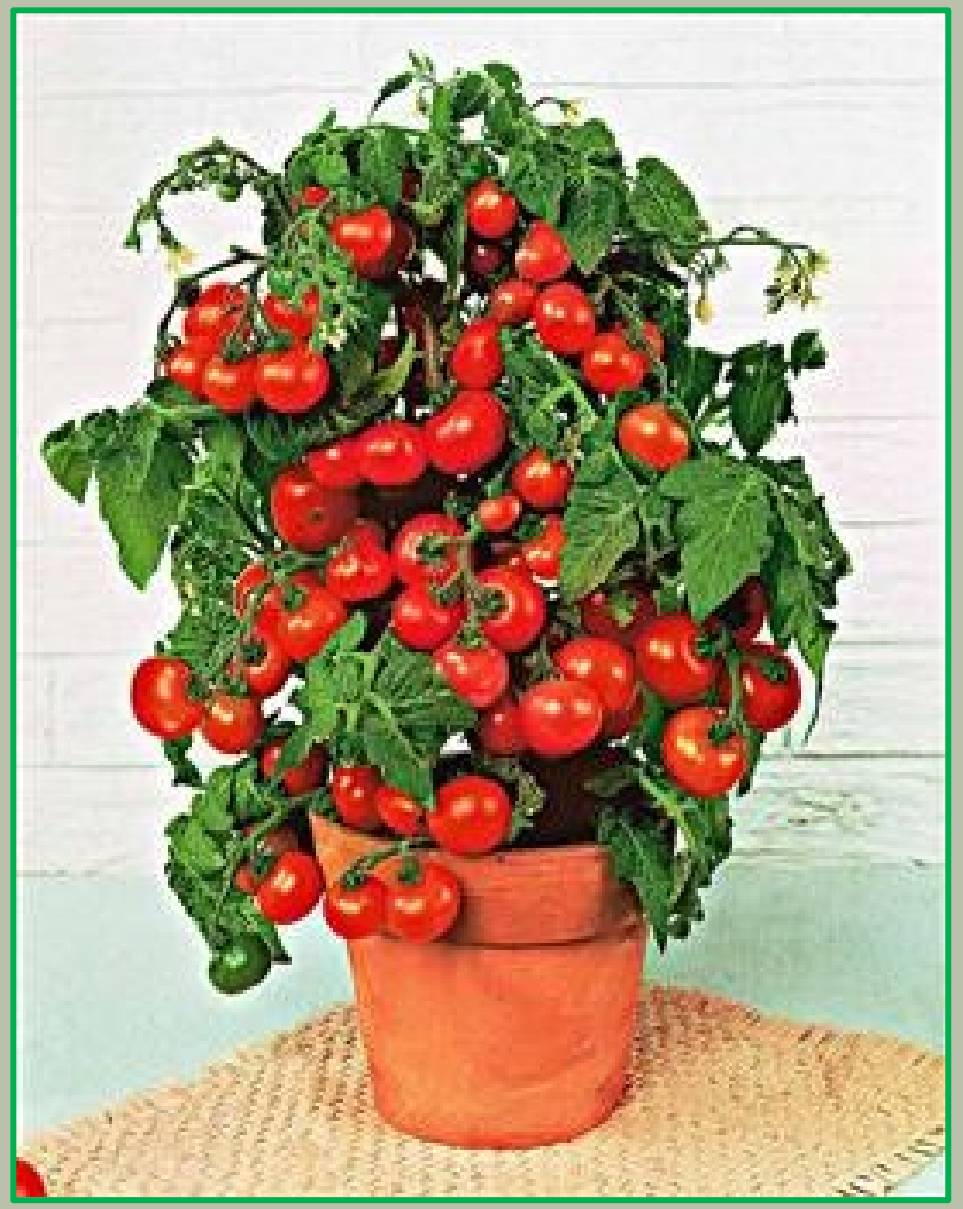
Selecting Seedlings

Read the plant tag.

Growth Habit

Determinate or

“bush” tomatoes



Growth Habit

Indeterminate

tomatoes

Heirloom or Hybrid

Heirloom, or “open pollinated” (OP)

Hybrid

Disease Resistance

V Verticillium Wilt

F Fusarium Wilt

FF Fusarium, races 1 and 2

FFF Fusarium, races 1, 2, and 3

N Nematodes

A Alternaria

T Tobacco Mosaic Virus

Maturity

Days to maturity

Early season - 52 to 70 days

Mid season - 70 to 80 days

Late season - 80 to 90 days.

Purpose

Slice

Juice

Can

Dehydrate

Size

Shape

Color

Selecting Seedlings

Ask for help if you're not sure!

Selecting Seedlings

Big is not

necessarily

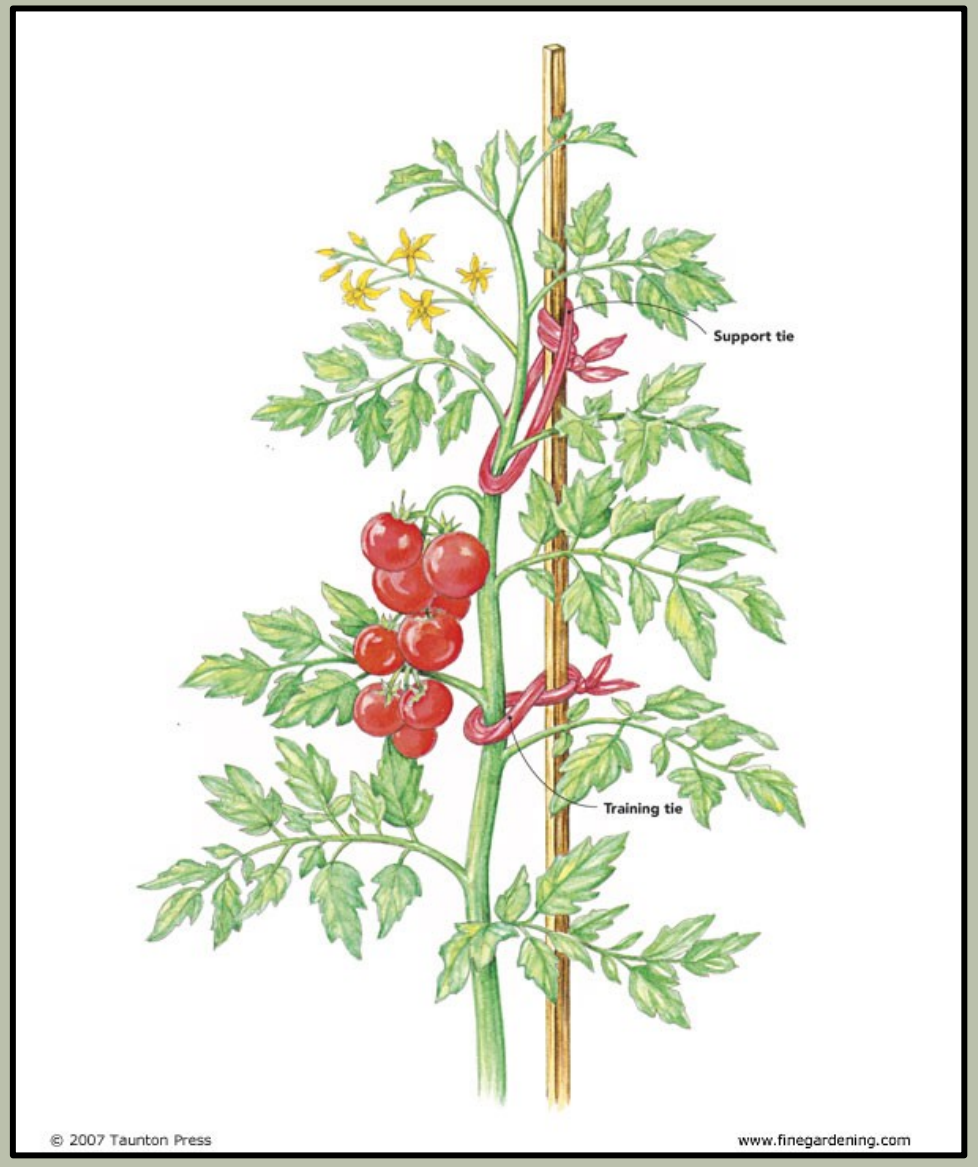
best!

Selecting Seedlings

Go for leafy rather than tall.

Selecting Seedlings

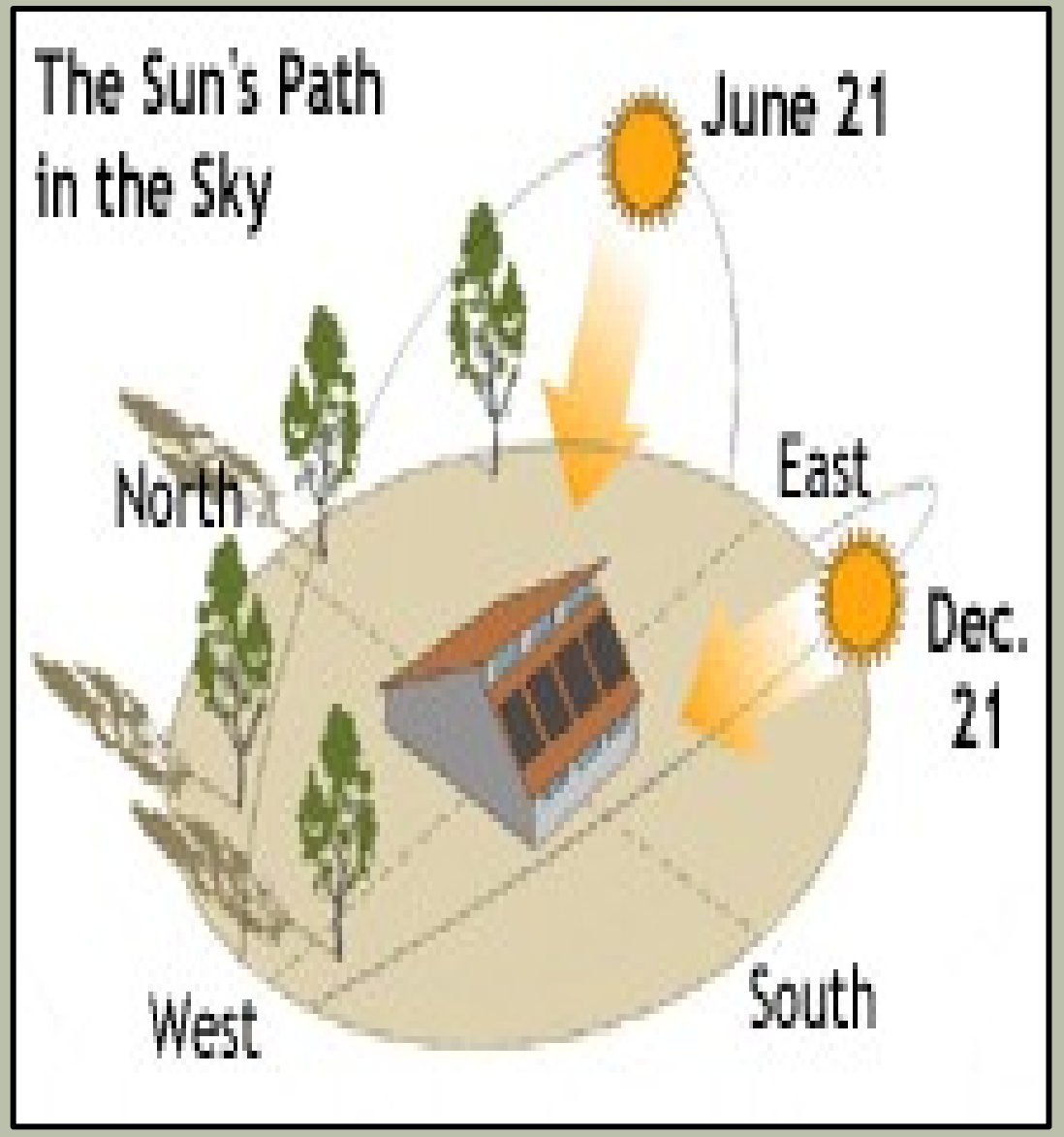
Don’t buy plants that already have flowers.



Site Requirements

Full Sun - 8 hours

Shade - know where it will occur.



Site Requirements

Water

Crop rotation

Tomatoes and their relatives such as peppers, chiles, potatoes, and eggplant should be rotated in your garden to minimize soil-borne diseases.

1st Rule of Garden Soil Preparation: DO NO HARM!

Avoid compaction

Avoid excessive soil disturbance

Avoid chemical/synthetic fertilizers and . . .

Moderation is key.

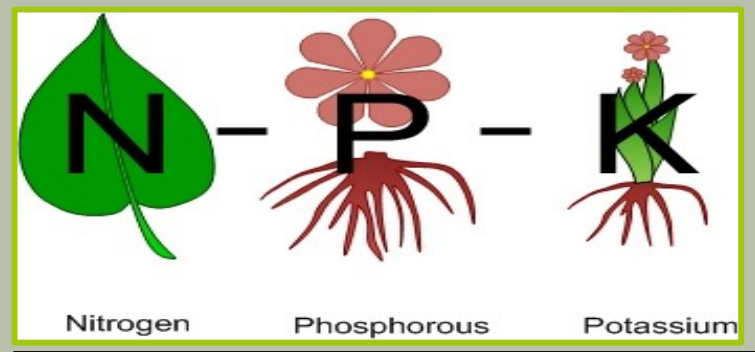
2nd Rule of Garden Soil Preparation: REMOVE ALL WEEDS!

Weeds compete
with your vegetables
for water and nutrients

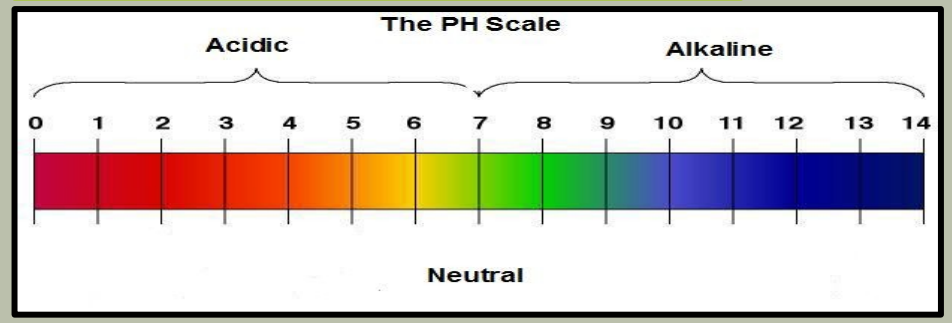
3rd Rule of Garden Soil Preparation: Amend, Amend, Amend!

Add organic matter

Add fertilizer



Adjust pH



Soil Temperature

Day >60 degrees

Night >50 degrees

The Last Frost Date

Probability of frost in the spring:

50% - Feb 22nd

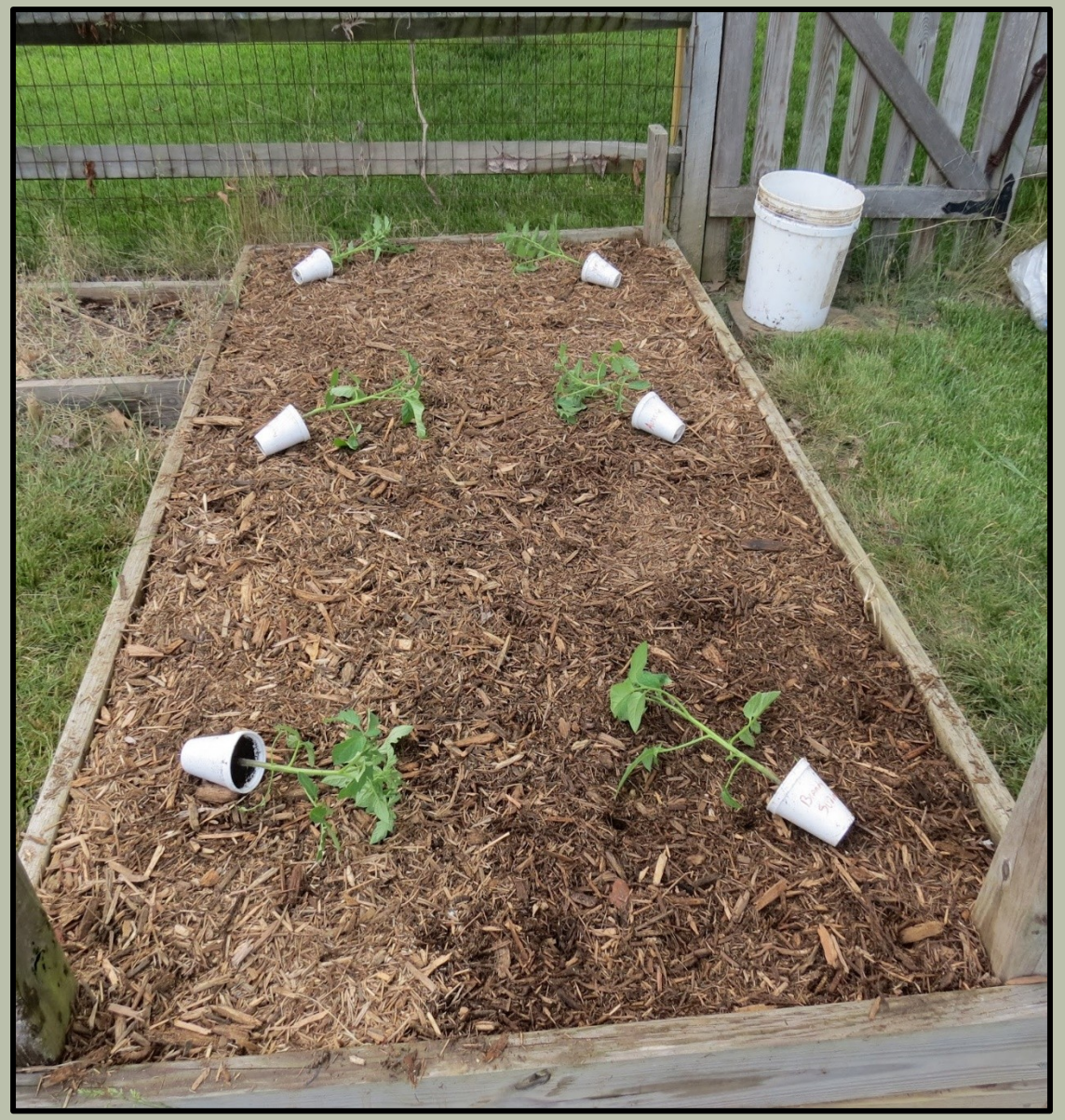
10% - April 6th

Planting Your Seedlings

Water plants thoroughly before placing in the ground.
Plant on a cloudy day or in the late afternoon to lessen transplant shock.

Planting Your Seedlings

Plant seedlings 2’ to 3’ apart to allow for growth and ease of harvesting.



Planting Your Seedlings

Gently
-remove plant from pot

-loosen roots if tight before placing in planting hole

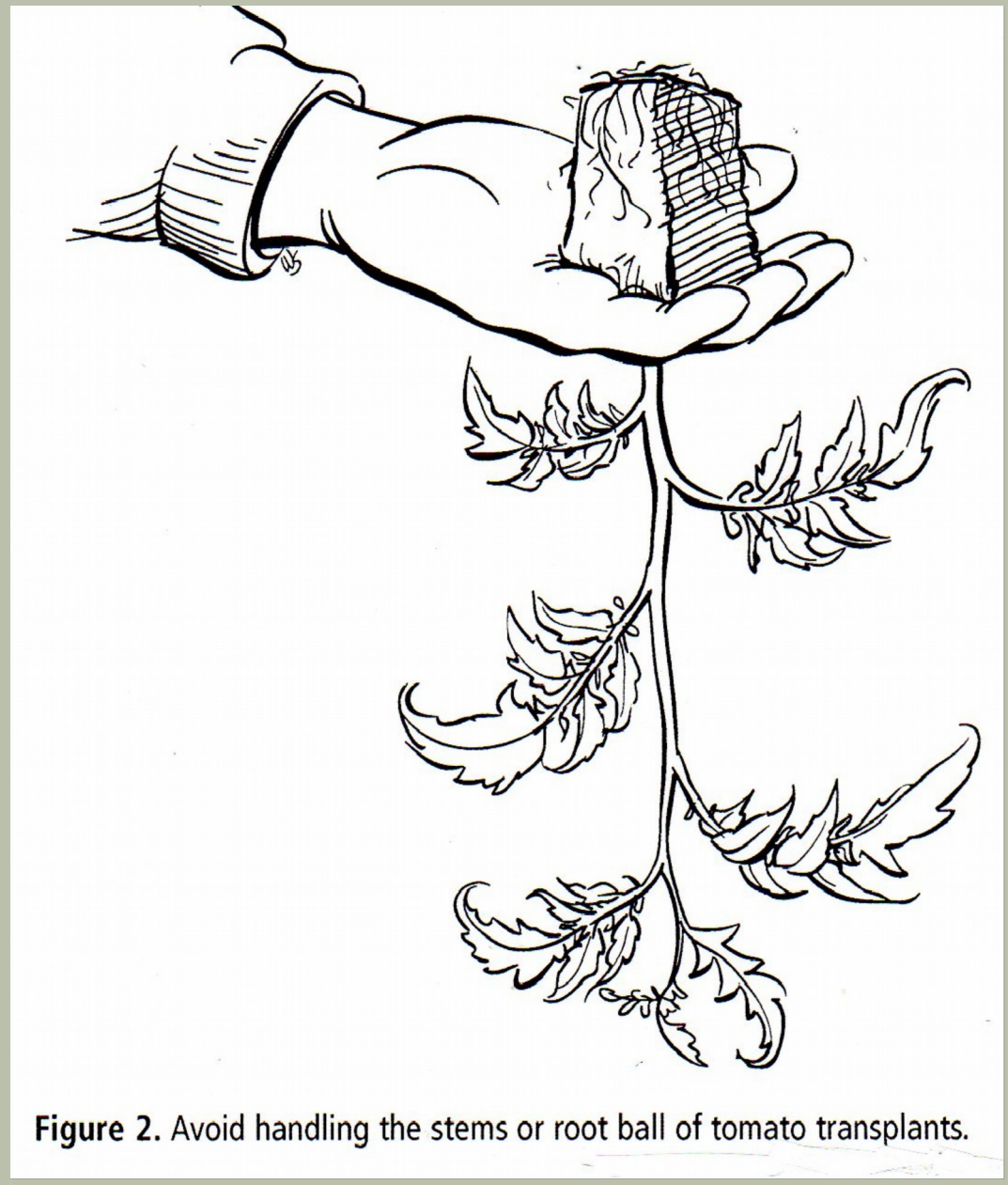


Figure 2. Avoid handling the stems or root ball of tomato transplants.

Planting Your Seedlings

Remove bottom leaves

2/3 of the plant goes into the planting hole

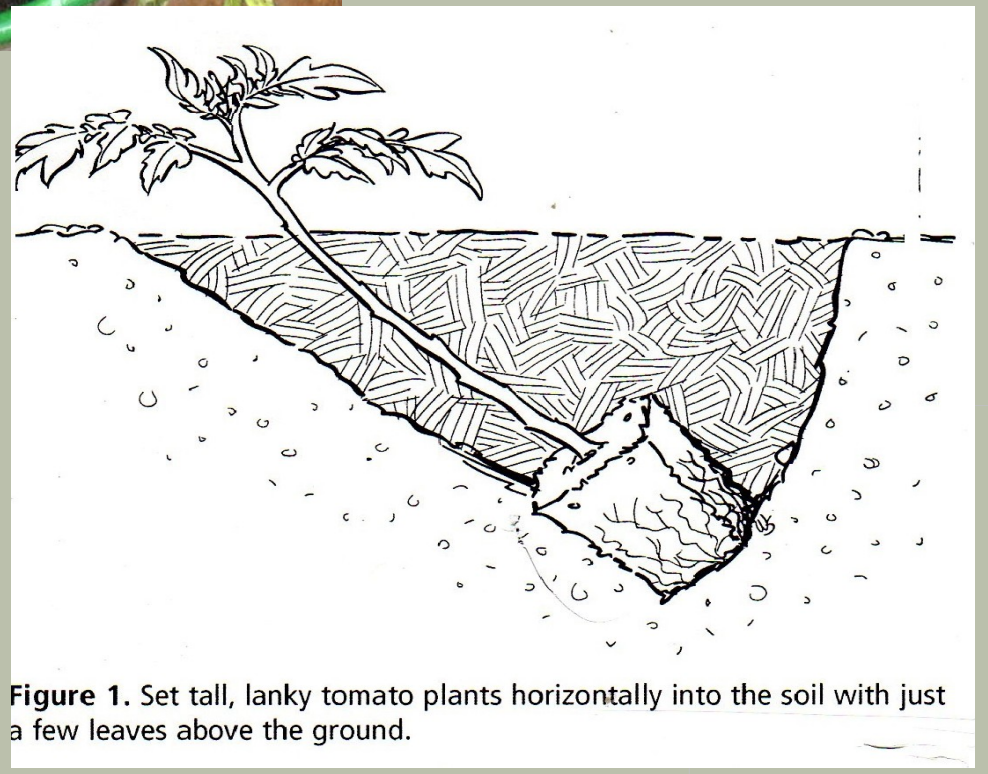


Figure 1. Set tall, lanky tomato plants horizontally into the soil with just a few leaves above the ground.

Growing Recap

Keep soil moist but not wet

Avoid wetting foliage or fruit

Decrease watering when ripening begins

Fertilizer, balanced, after fruit set

Pruning – not necessary, but ok if you want

http://www.ipm.ucdavis.edu/PMG/GARDEN/VEGES/tomato.html

Find All Kinds of Help

http://www.ipm.ucdavis.edu/PMG/GARDEN/VEGES/tomato.html

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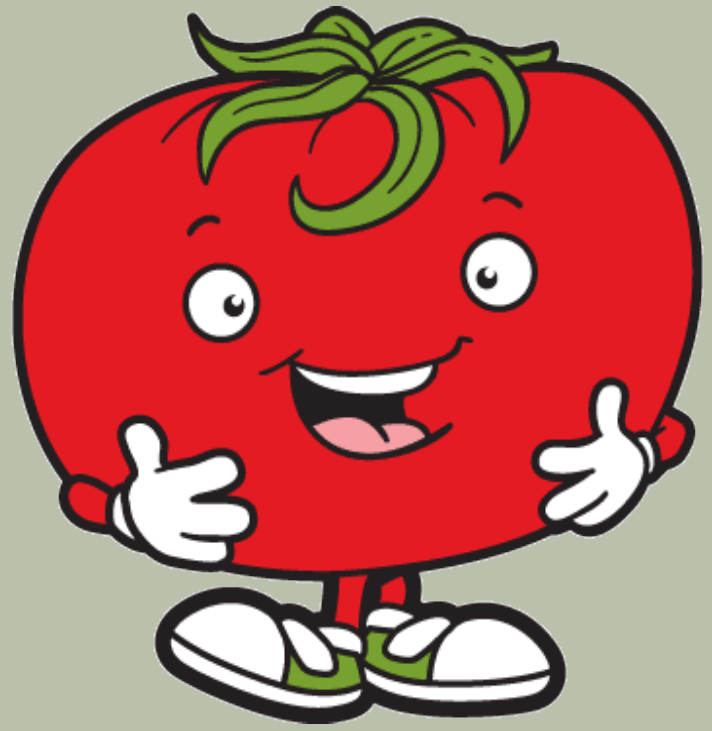
Caring for Your Tomatoes

Support

Containers

Water

Fertilizer



Support: To Stake or Not To Stake

To keep plant and fruit off the ground

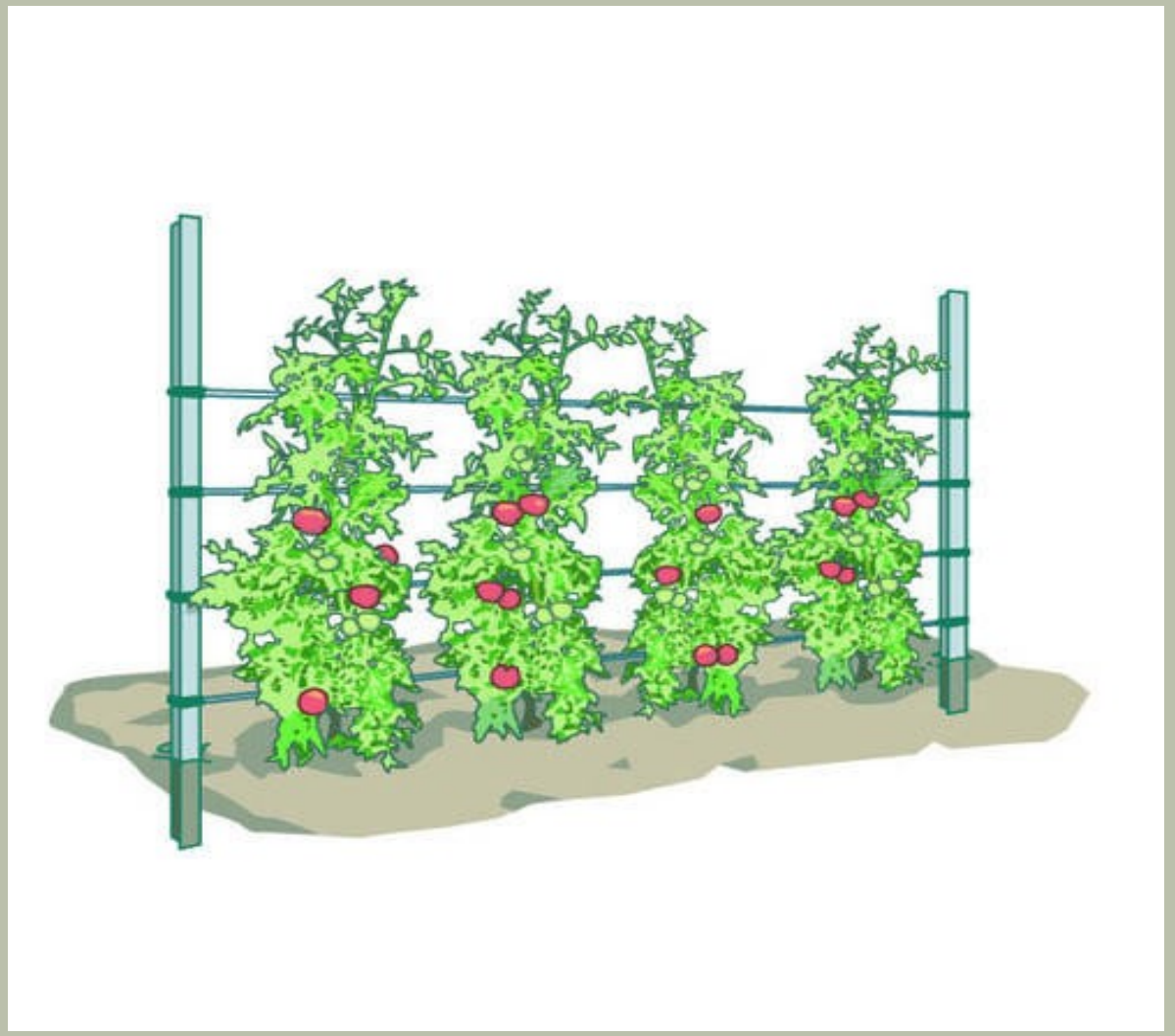
Opens the plant for air and light

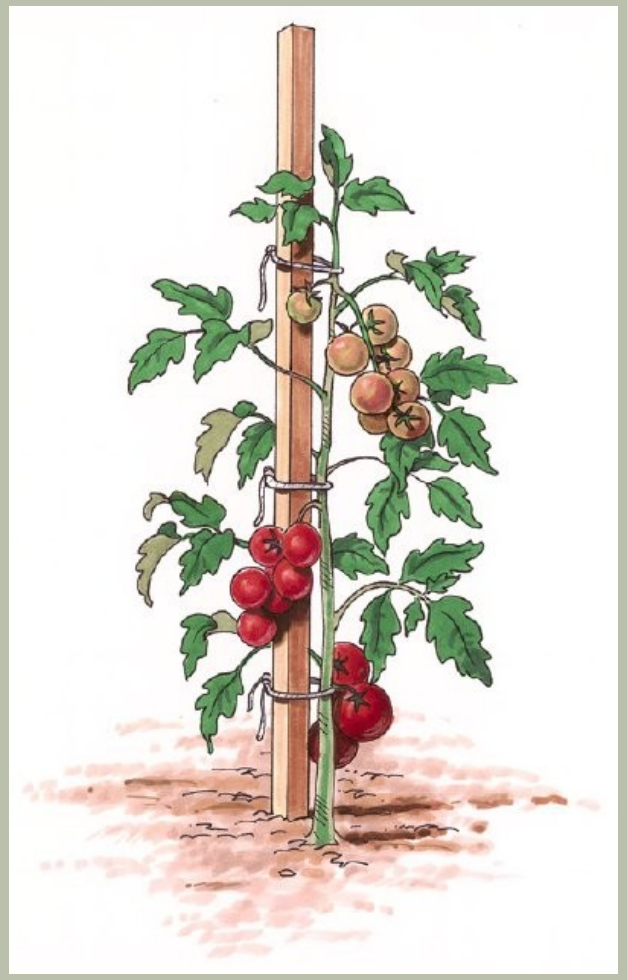
Harvesting

Provide support for all indeterminate plants and some determinate

When in doubt: Support!

Cages, Stakes, or Trellises...
Which is best for growing tomatoes?





Cages, Stakes, or Trellises...
Which is best for growing tomatoes?

ANSWER: It doesn’t Matter —Just DO Something

Containers: Why and How?

Small space

Don’t want to leave the patio

Don’t want to deal with a backyard vegetable garden

Like flowers and plants better, but also like a BLT sometimes

My neighbor is pressuring me

My spouse won’t do it

What Kind of Container is Best?

One that will grow tomatoes

Has soil—Ah, but ONLY the right kind. “Potting Soil”

Has holes for water to drain out

Size can be handled if need to move--by you or spouse, if willing.
Maybe platform with wheels

Enough space in or around the container to provide support

Pot Them Up

Crate Expectations

Hang In There

Container Growing

Use really big containers

Determinate better than indeterminate

Requires more frequent watering

Use potting soil

Requires more fertilization

Requires same amount of sun – 8 hours per day

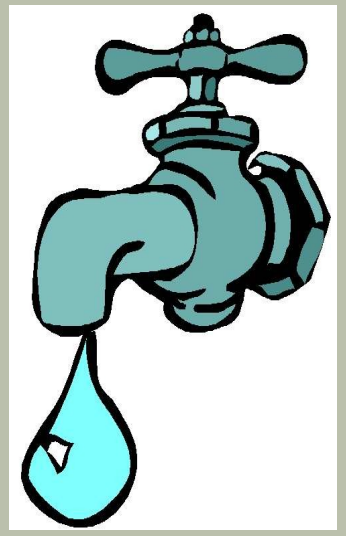
To Prune or Not to Prune: Is That Your Question?
IT DEPENDS!

Control Height

Open up for light and air (Be careful about sunscald)

Ease of harvesting (finding ripe ones)

Pinching off suckers: OK, but results mixed. Do when very small



IRRIGATION, Tomatoes & YOU

Water needs depend on many factors

Soil Condition (sandy, clay, loam)

Weather and wind

Ambient temperature

In ground or container

How to Water

Use drip or trickle irrigation(Check for leaks

Hand water at roots

Best to water in morning when cool

Use a timer

Do NOT water foliage or fruit

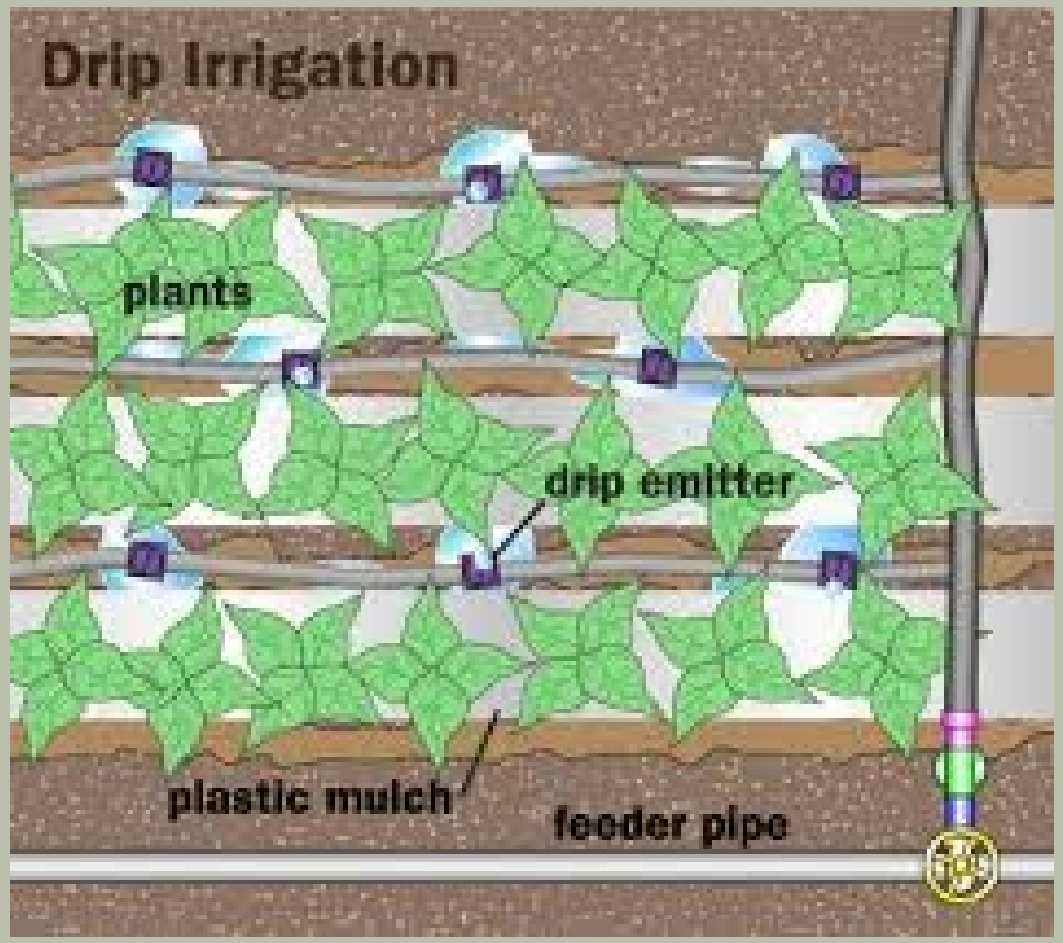
Over Head Sprinklers?
NOOOOOOOOOO!!

Low labor time, BUT need to water a long time to get deep into roots; water loss to evaporation

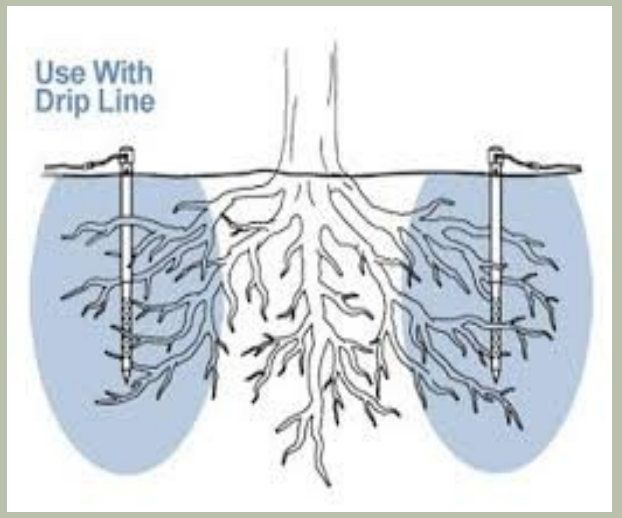
Hand Water? NOOOOOOOO! Well, not like this

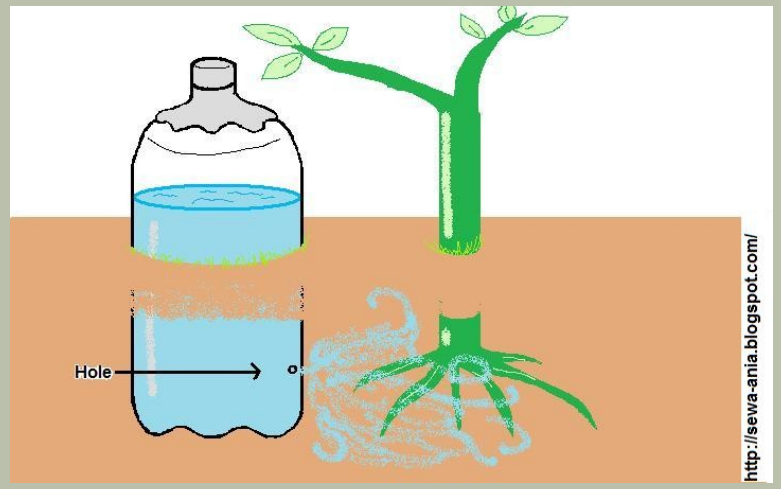
Labor intensive; Unlikely to get to roots.
Need to get down to base of plant. Water evaporation

Better Options



Some Other Ideas





Watering: How Much, How Often?
IT DEPENDS (sorry)

Tomatoes are a Very high water need plant

Deep to three feet—roots go very deep

Reduce when fruiting

Keep soil moist—not too wet for too long (roots can drown)

Keep water off foliage and fruit

Decrease when ripening begins

Avoid fluctuations in soil moisture: Fruit cracking and blossom end rot

Weeds compete for moisture and nutrients (Get rid of them!)

Monitor—Monitor--Monitor

Finger or probe.

NOTE: Drooping leaves do NOT always mean the need for watering. Avoid overwatering. Roots can drown. Some tomato plants droop…just because that's who they are, and what they want to be.

And of course: Mulch—Mulch--Mulch

Fertilize? When? With What?
IT DEPENDS

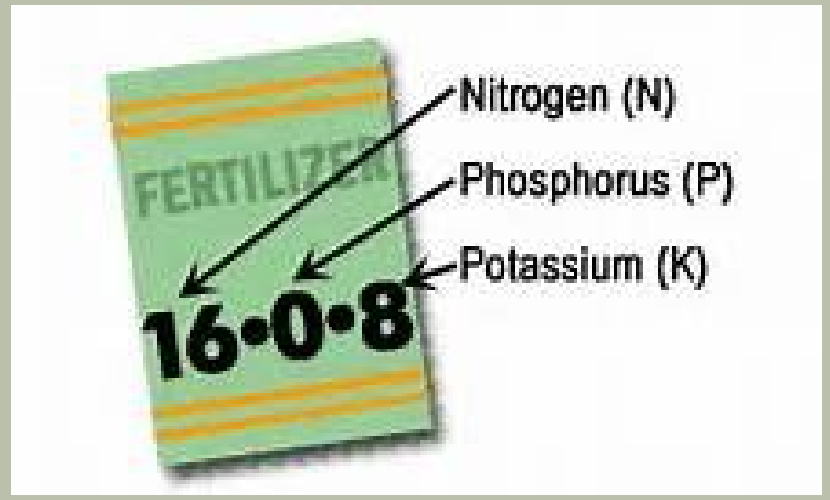
Native soil? Existing garden? Raised Bed?

Added amendments recently? With What? Compost, manure?

Healthy, vigorous transplants shouldn't require it until flowering and fruit set are well underway.

If you do fertilize: **Warning: Excessive nitrogen early will provide rich, green growth and result in late flowering and fruit set. Likely reducing production.**

Learn Your Fertilizer Alphabet: N-P-K



It is on all the labels

5-X-X **Nitrogen** promotes green leafy growth

X-5-X **Phosphorus** assists in flower, seed, and fruit production

X-X-5 **Potassium** helps develop root and tubers
(why “K”? Because: **K**NO3 is the chemical sign for Potassium Nitrate)

Organic Fertilizers Vs Synthetic

Organics are more environmentally friendly than synthetic.

However, research shows both can be effective IF used according to directions and any cautions.

Organic are slower acting and longer lasting;

Synthetic are faster acting, but can burn if over used.

READ the labels and follow instructions closely. More is not always better.

Analyses of some organic fertilizers

Seaweed (kelp) Not for NPK, but for micro nutrients

Fish meal 10-6-2 or emulsion 5-2-2

Soybean meal 7-2-1

Alfalfa pellets 2-1-2

Blood meal 12-0-0

Bone meal 3-15-0 (phosphorus not effective if soil ph over 7.0

Animal Manure

NPK Values of Common Farmyard Manures - Cow, Horse, Pig, Chicken, Sheep & Rabbit

Let's take a look at the N-P-K values of the most common farmyard manures. These are prett
variable according to the diet the animals have had, how long it has been rotted for etc but
gives a reasonable idea.

NPK Values of Animal Manures

	N Nitrogen %	P Phosphorus %	K Potassium (Potash) %
Cow Manure	0.6	0.4	0.5
Horse Manure	0.7	0.3	0.6
Pig Manure	0.8	0.7	0.5
Chicken Manure	1.1	0.8	0.5
Sheep Manure	0.7	0.3	0.9
Rabbit Manure	2.4	1.4	0.6

Synthetic Fertilizers

Fast-acting

Often less expensive

Can be hazardous to plants or soil if used incorrectly or too much

Key: Use according to the directions on the bag/box and in moderation to avoid plant damage and environmental pollution due to overuse.

Ways to Fertilize

Add to soil before planting (slow release forms are an option)

Liquid solutions: Watering can or solution in irrigation system.

"Side-dress" by working a granular fertilizer into top inch of soil near plant roots and water in well.

Do NOT spray the foliage or fruit

And here is your reward for a job well done!

Diseases, Invertebrates, Environmental Disorders . . .

Curly Top (NOT Shirley Temple!)

Fusarium Wilt

Verticillium Wilt

Verticillium Wilt

Early Blight

Late Blight

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Avoid Most Problems by . . .

1. Overhead watering – NO.
2. Choose resistant types.
3. Practice good hygiene.
4. Crop rotation—no more than 2 years.
5. Solarize.

Invertebrates

Hornworm

Tomato russet mite

And a whole bunch more!

Hornworm - 4 Inches Long!

They Like Tomatoes!

This is the Moth—over 4 inches!

Tomato russet mite

Environmental Disorders

Blossom end rot

Catfacing

Fruit cracks

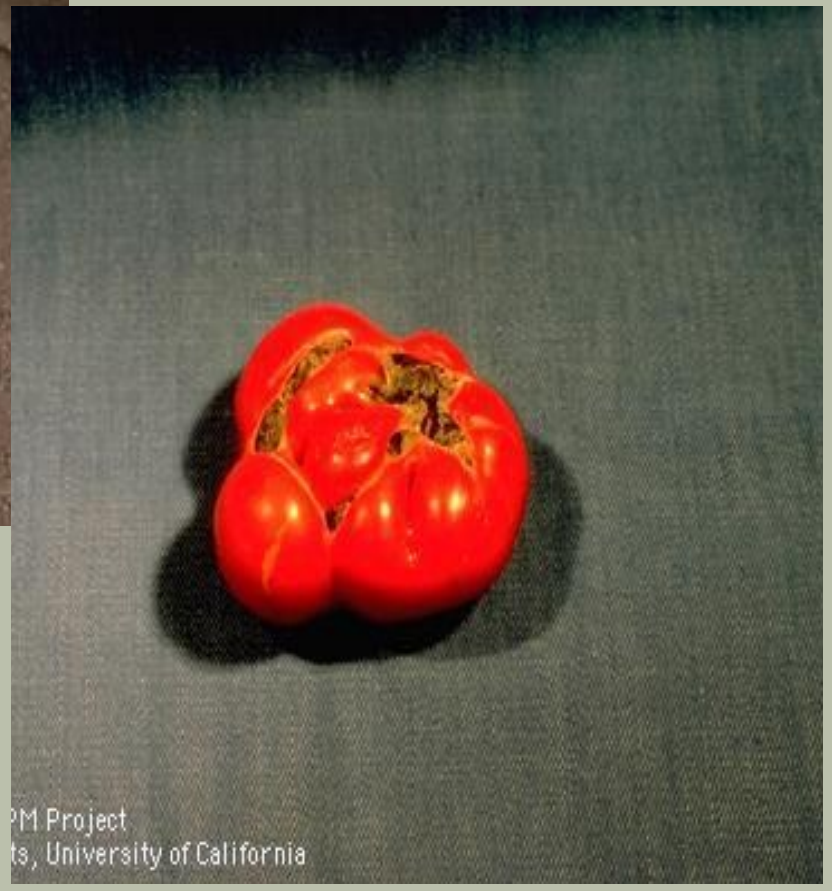
Sunscald

Tomato leaf roll

Blossom End Rot

Blossom drop and poor fruit set

Catfacing

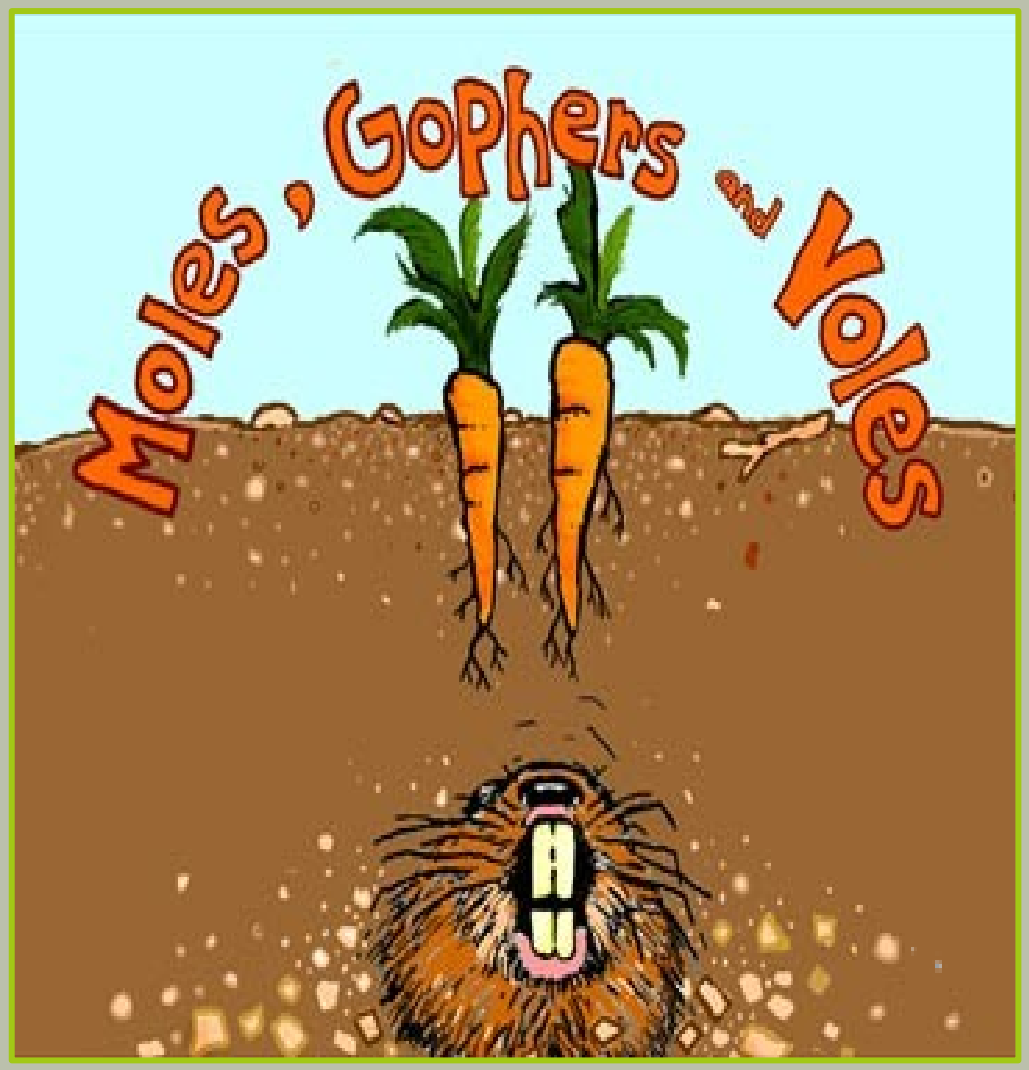


Fruit Cracks

Sun Scald

Tomato Leaf Roll

Vertebrate Pests



Birds

Bambi

Now Ubiquitous Pest

Find All Kinds of Help

http://www.ipm.ucdavis.edu/PMG/GARDEN/VEGES/tomato.html

Harvest & Maturity

- When to harvest.
- How to harvest.
- Extending your tomato harvest.
- Ripening green tomatoes.
- Refrigerating tomatoes.
- Storing tomatoes.
- Water content of tomatoes.
- Is a tomato a fruit or vegetable?
- How many tomatoes will a plant produce?
- How many pounds of tomatoes are needed to produce a quart of sauce?
- Are all paste tomatoes created equal?
- Origin of tomatoes.
- Little known tomato facts.

Harvest & Maturity

When to harvest

- When the tomato has reached full color.
- Once ripening begins check progress almost daily.
- Know what was planted so that you're not waiting for an orange tomato to turn red.

How to harvest

- Cut or gently twist off the fruits, supporting the vine or the tomato at the same time to keep from damaging it.

Harvest & Maturity

Extending tomato harvest into fall.
Plant a few tomato plants in June.

- Start from seed in late April.
- Choose varieties with a short maturity (55 days or so).
- Make sure you know where the sun will be in the fall months so that your plants will receive 8 hours of sunlight.
- Protect your plants from frost.

Harvest & Maturity

Storing tomatoes

- Tomatoes should never be refrigerated.
  - Affects the smell and texture.
  - Does not change the sugar content or acidity.
- Wash and dry tomatoes before storing.
- Unless you’re planning to store your tomatoes for over a week, a windowsill, counter-top or bowl works fine.
- Tomatoes keep longer with the stem down.

Harvest & Maturity

Ripening green tomatoes

- Test for ripening ability - cut one in half with a knife.
- If the interior is yellowish and the tissues are jelly-like or sticky, it will probably ripen.
- If your green tomatoes pass the test then harvest as many as you want to save.
- Wrap in newspaper, place in a box and store the box in a cool area.
- Check the ripening process every few days.

Tomato Trivia

Q: How much water is there in a tomato?
A: It depends. Paste tomatoes average 85% water and slicing tomatoes are around 95% water.

Why is this important?

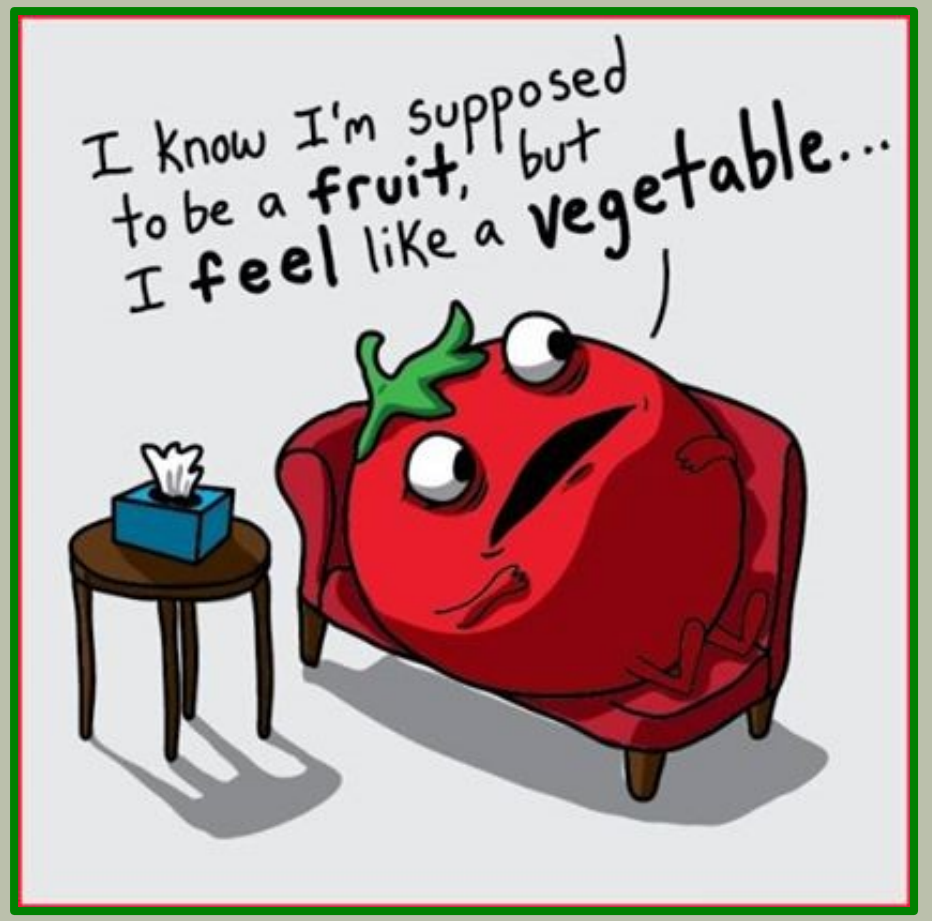
- Tomatoes with lower water content are better for cooking and canning.
- Eating a tomato after exercise can hydrate your body twice as effectively as a glass of water.

Tomato Trivia

Q: Is a tomato a fruit or vegetable?
A: It depends on your point of view.

Why is this important?

- It isn't. A tomato is technically a fruit because it is a ripened ovary of a plant. But for trade purposes a tomato is considered a vegetable. The identity crisis stems from an 1893 Supreme Court ruling that classified the tomato as a vegetable so it could be taxed under tariff law.



Tomato Trivia

Q: How many tomatoes will a single plant produce?
A: It depends on the type of tomato.

- One cherry tomato plant can grow to over 6’ tall and produce enough tomatoes for a family of 4.
- One paste tomato plant can produce up to 200 tomatoes.
- One beefsteak tomato plant can produce 10 to 20 tomatoes.

Tomato Trivia

Q: How many pounds of tomatoes are needed to produce a quart of sauce?
A: It depends on desired consistency, 5 to 7 pounds depending on water content.

- Paste tomatoes (Roma, San Marzano, Big Mama) are very meaty and with less water so fewer pounds are needed.
- Beefsteak tomatoes have higher water content so more pounds are needed.

Tomato Trivia

Q: Are all paste tomatoes created equal?

A: Not really.

Why is this important?

- If your paste tomato plant produces 100 tomatoes you will have 2 or 3 times as many tomatoes with Opalka, Federle, Big Mama or Amish Paste than with San Marzano.

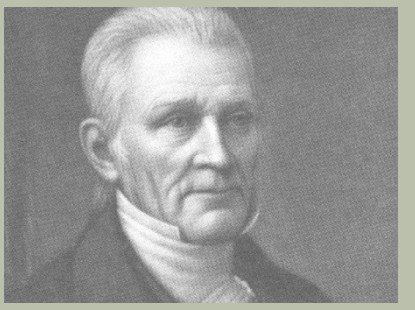
Tomato Trivia

True or False? Tomatoes originated in Italy.
A: False. Tomatoes are native to South America and eventually spread to Mexico where they were discovered by European explorers in the late 1400's and taken home with them.

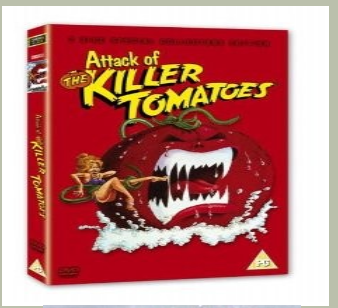
Tomato Trivia…..little known facts.

- At one time the French believed tomatoes had aphrodisiac qualities and called them *pommes d'amour* (love apples).

- When tomatoes were introduced in the USA in the early 1800's they were thought to be poisonous. In 1820 Robert Gibbon Johnson disproved this claim by eating an entire basket in front of a crowd.



- In 1978 the low budget cult movie *Attack of the Killer Tomatoes!* starred George Clooney and inspired 3 sequels.



- The largest tomato on record weighed 7 ¾ pounds and was grown in Edmond, OK.

Harvest & Maturity

Days to maturity—plan for a long harvest by selecting tomatoes for early, mid, and late season

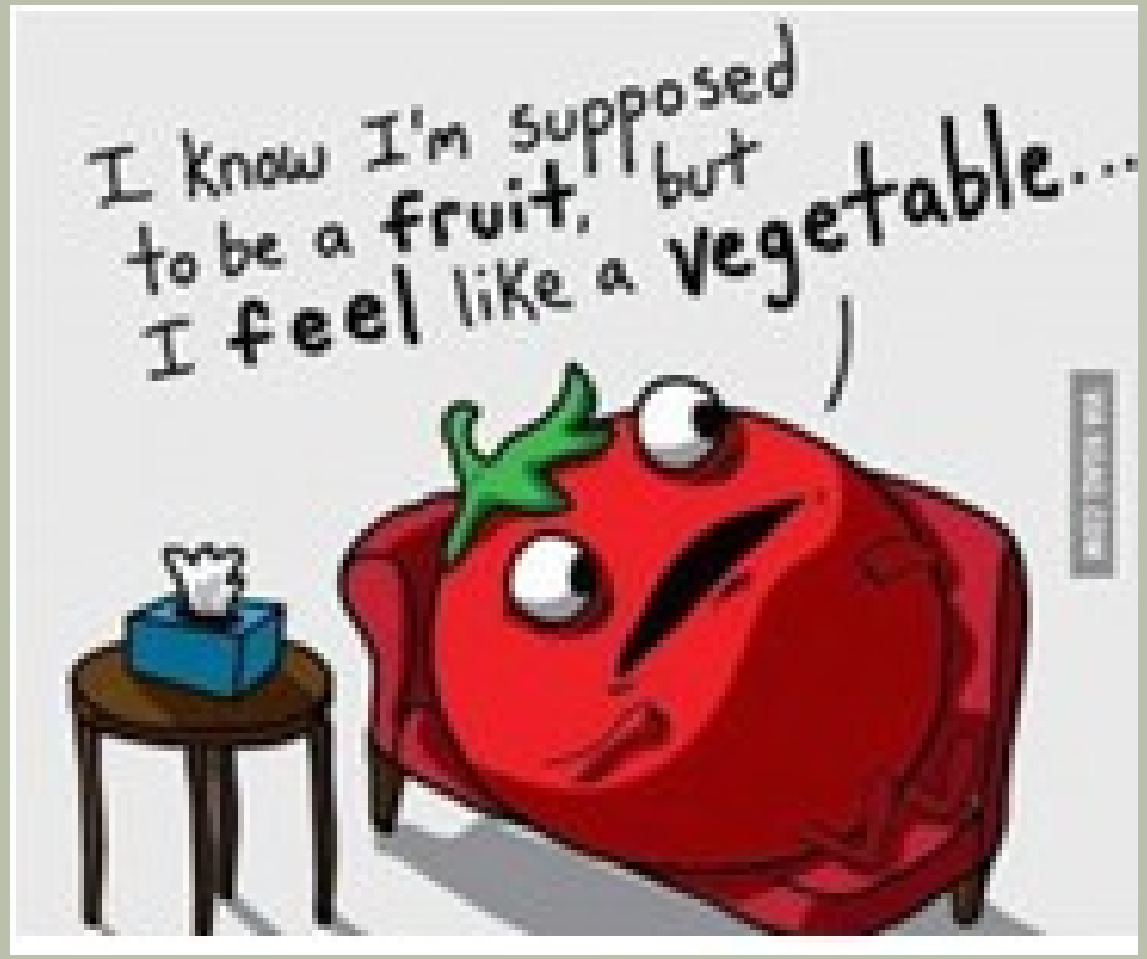
Color—pick when at full color for the variety

Refrigeration dulls the texture and flavor of ripe tomatoes

Showcase the variety by the way it’s prepared

Green tomatoes—will ripen on the counter if there is jelly inside the fruit

And to answer the age-old question . . . .



KNOWLEDGE is knowing a tomato is a fruit. **WISDOM is not putting it in a fruit salad.**

Master Gardeners Online:
A Guide to Find Information

Napa·Master·Gardeners·Internet·Gardening·Resources·¶

Tomatoes:·April·2016¶

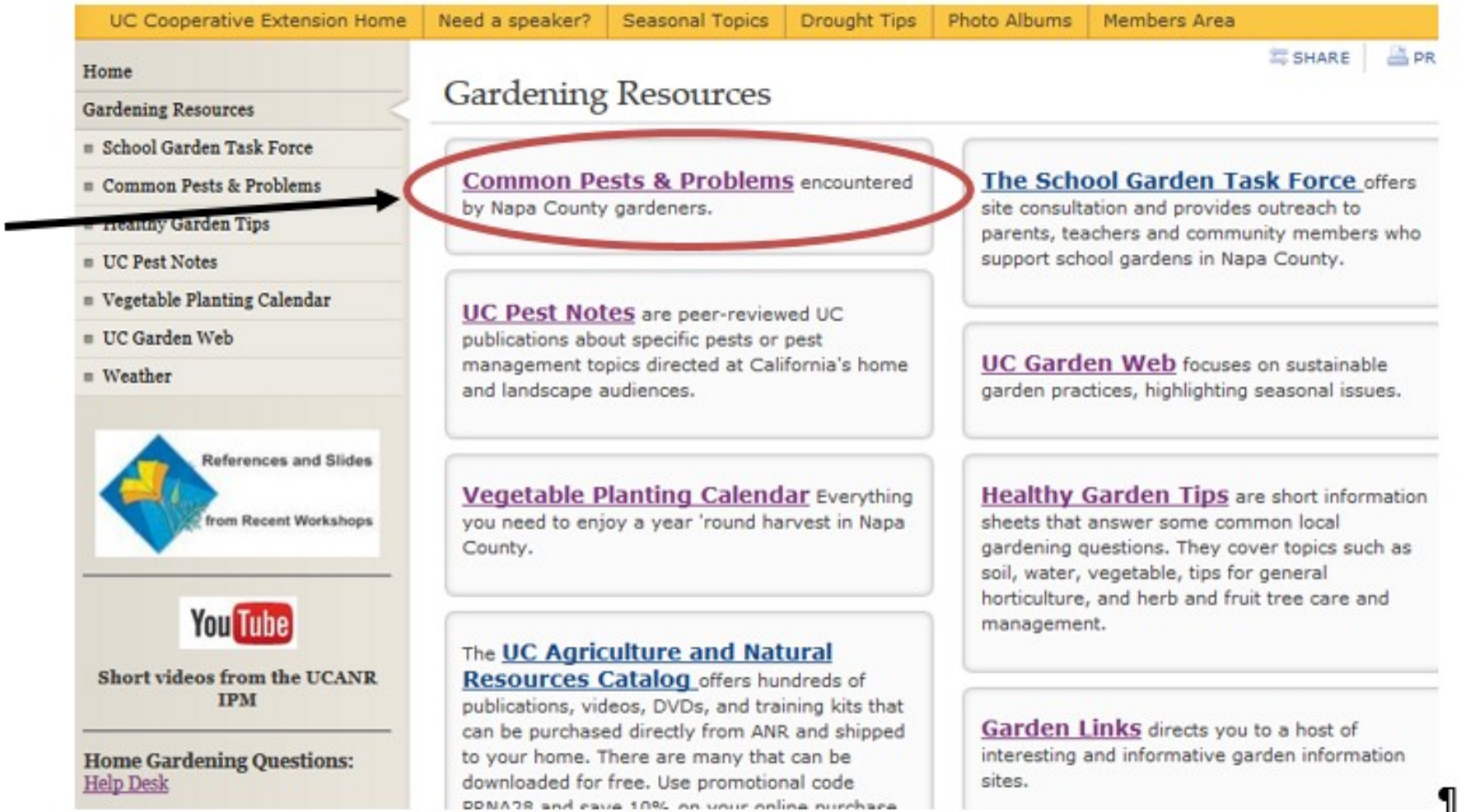
Start:·Search·"Napa·Master·Gardeners":¶

or·enter:··http://ucanr.edu/sites/ucmgnapa/¶

1.·Select·"Gardening·Resources"¶

¶

2.·Select:·"UC·Pest·Notes"···http://ucanr.edu/sites/ucmgnapa/Gardening_Books/¶



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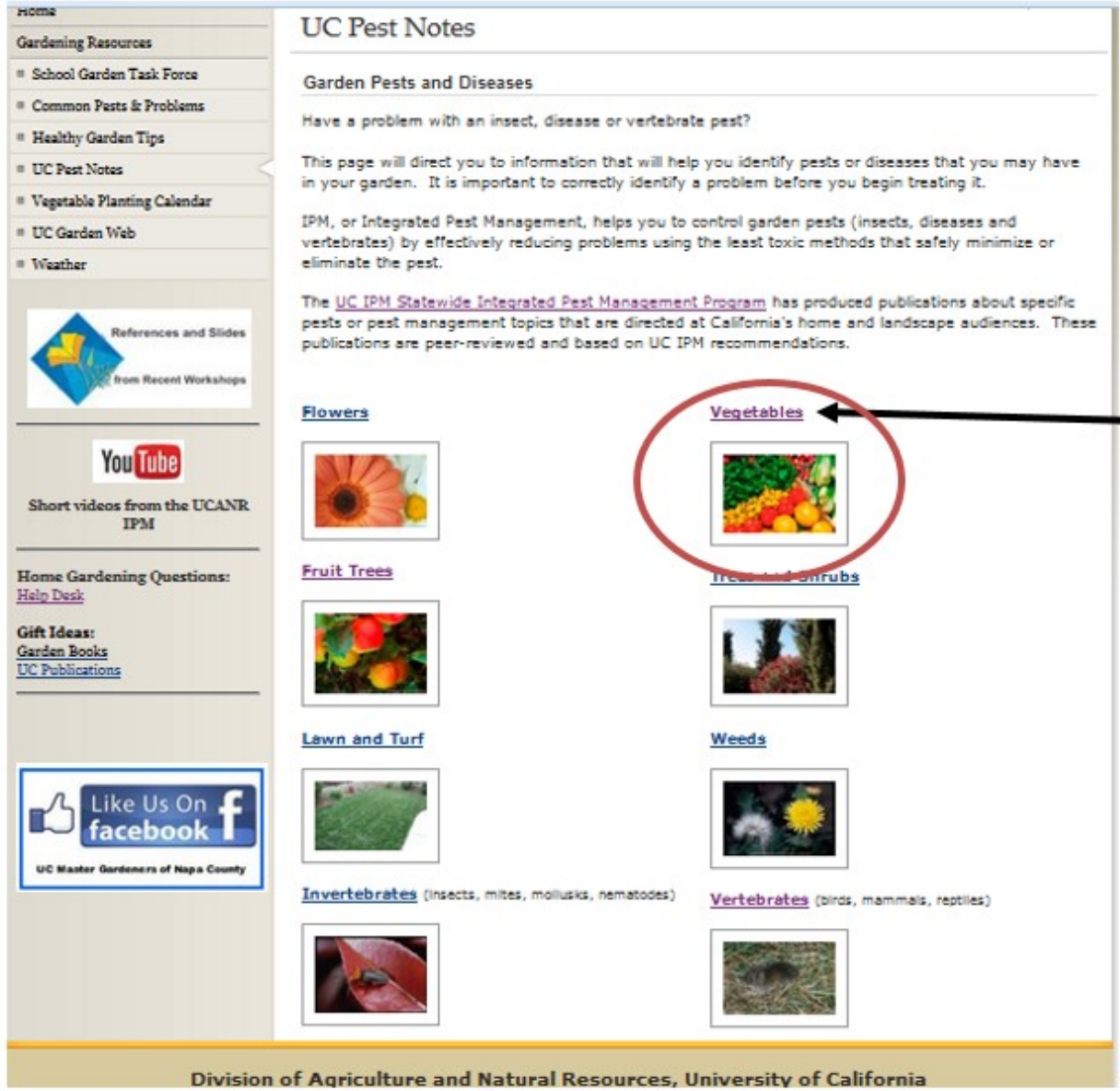
3.·Select·"Vegetables"···http://ucanr.edu/sites/ucmgnapa/Gardening_Books/UC_Pest_Notes/¶



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3.·Select·Tomatoes····http://www.ipm.ucdavis.edu/PMG/GARDEN/veggies.html¶

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- Asparagus
- Beans
- Broccoli
- Brussels sprouts
- Cabbage
- Cantaloupe
- Carrots
- Cauliflower
- Corn
- Cucumbers
- Eggplant
- Lettuce
- Onions and garlic
- Peas
- Peppers
- Potatoes
- Pumpkins
- Spinach
- Squash
- Tomatoes
- Watermelon

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Good Information

Tomatoes

Cultural tips

- Fertilizing
- Harvesting and storage
- Planting
- Pruning
- Site selection
- Soil improvement
- Soil preparation
- Soil recommendations
- Time to plant
- Watering

Pests and disorders of Tomatoes

Invertebrates

- Aphids
- Armyworms
- Buffalo treehopper
- Cutworms
- Flea beetles
- Hornworms
- Leaffooted bug
- Leafminers
- Loopers
- Lygus bugs
- Nematodes
- Potato tuberworm
- Snails/slugs
- Stink bugs
- Thrips
- Tomato fruitworm
- Tomato pinworm
- Tomato russet mite
- Vegetable weevil
- Whiteflies
- Wireworms

Diseases

- Black mold
- Curly top virus
- Damping off
- Early blight
- Fusarium wilt
- Late blight
- Phytophthora root rot
- Powdery mildew
- Tobacco mosaic virus
- Tomato spotted wilt virus
- Verticillium wilt
- White mold

Environmental disorders

- Common environmental disorders
- Blossom end rot
- Catfacing
- Fruit cracks
- Sunscald
- Tomato leaf roll

Vertebrates

Weeds

Blossom end rot

Plants with blossom end rot show small, light brown spots at the blossom end of immature fruit. The affected area gradually expands into a sunken, leathery, brown or black lesion as the fruit ripens. Hard, brown areas may develop inside the fruit, either with or without external symptoms. The disease is not associated with soil contact or with damage to other plant parts.

Solutions

Blossom end rot results from a low level of calcium in the fruit and water balance in the plant. It is aggravated by high soil salt content or low soil moisture and is more common on sandier soils. To reduce rot, monitor soil moisture to make sure that the root zone neither dries out nor remains saturated. Follow recommended rates for fertilizers. Some varieties are more affected than others. The disease is not caused by a pathogen; there are no pesticide solutions.

Start of blossom end rot on tomato fruit

Sunken, leathery lesions on tomatoes

Slides and Documents of today's Workshop (& Others)

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Just One More Thing…..

Questions?

Thank you! And please, tell a friend!

Thank you!