

# Tahoe Fruit & Vegetable Workshop Series

## Tahoe's Problem Child – The Tomato

Are you Kidding Me – Growing Tomatoes at Tahoe ?



Hobby Junkies image



Pinterest image



passingthru.com image

# Tahoe Fruit & Vegetable Workshop Series

## Growing Tomatoes at Tahoe

### Topics covered:

1. Project overview
2. Phenology
3. Taxonomy and anatomy
4. Planting and care
5. History and culinary aspects
6. Varieties and Supplier information
7. Distribution of plant materials



Beaver Lodge  
TomatoFest Image

# Tahoe Fruit & Vegetable Workshop Series

## Growing Tomatoes at Tahoe

Master Gardeners are community members who have been trained under the direction of the University of California (Davis) Cooperative Extension. **50 hours of formal classroom training**

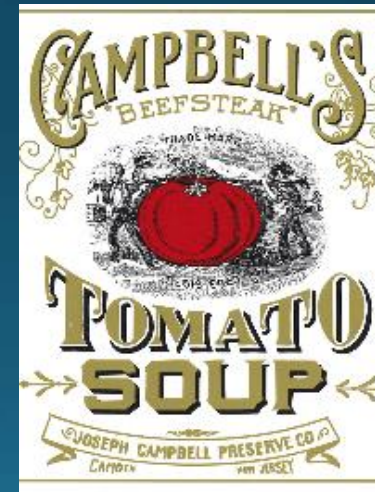


We assist the UC Cooperative Extension by providing practical, scientific gardening information to the home gardeners in the Lake Tahoe Basin.

**The Lake Tahoe Master Gardeners offer research-based information by:**

Answering questions via email hotlines, farmers markets and at community events.

Offering workshops and classes



Campbell Soup Co.  
image

Co-operative Extension Tahoe Basin Master Gardeners

**University of California**  
Agriculture and Natural Resources



# Tahoe Fruit & Vegetable Workshop Series

## Growing Tomatoes at Tahoe

### Master Gardeners



Work with Community Gardens

Work with School Gardens



Do workshops

Co-operative Extension Tahoe Basin Master Gardeners



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## Growing Tomatoes at Tahoe

### Master Gardeners also

Answer Basic Gardening  
questions at Farmers'  
Markets

Most common  
answer to any  
question:  
It depends



Plant Sales

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## Growing Tomatoes at Tahoe

### Phenology

Phenology looks at growth and development differences between plant varieties that are due to weather and climate.

Merriam-Webster on-line Dictionary

Varietal Comparative Phenology (VCP) looks at growth and development differences between plant varieties that are due to weather and climate



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## Why Tomatoes?

Arguably the most common vegetable grown by US home gardeners

The most widely canned or bottled (commercially) vegetable

Challenge to grow in Tahoe/Truckee (No Kidding)

Gained legal status (for commerce) as a vegetable (1893)  
Nix v Hedden

The first commercially available genetically modified food licensed for human consumption was Calgene's Flavr Savr tomato, first sold in 1994 and discontinued in 1997

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## Growing Tomatoes at Tahoe

### What is the Flavr Savr?

- A tomato that will not soften while ripening on the vine.
- A tomato implanted with a gene from E. coli
- The transgenic tomato would allow tomatoes to be shipped safely, keep their color, and have their natural flavors.
- Increased shelf life



<http://www.google.com/imgres?imgres?q=flavr-savr-tomatoes&imgres>



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## Growing Tomatoes at Tahoe

California leads the nation in total tomato production

Florida and California are neck and neck in fresh tomato production

China is the world production leader followed by India and the US.

Egypt, Tunisia and Turkey have the highest per capita consumption

Italy exports more processed tomatoes than any country



UC Davis images



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## Growing Tomatoes at Tahoe

### Did you know

Eating tomatoes were featured on an episode of “You Were There!” on radio and television

The longest tomato vine was 65 feet in length

The biggest tomato weighed and amazing 7 pounds 12 ounces

The record for tomato production by a single plant is 342 lbs.

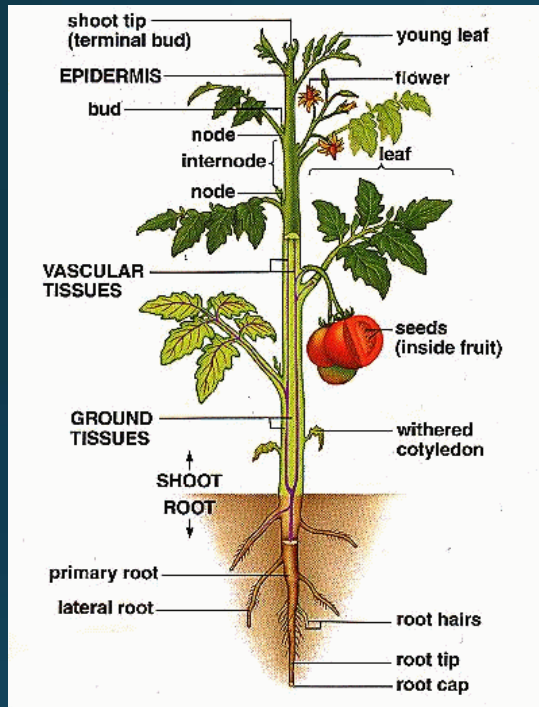
In 2000 the Heinz Co. introduced colored ketchups. – Called Easy Squirrt the colors were purple, green and blue. By 2003 all were discontinued.

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## Growing Tomatoes at Tahoe



Apologia Biology for Home  
School Image

Tomatoes are in the Solanaceae family as are potatoes, nightshade (belladonna) and eggplant

Tomatoes can be classified based on fruit color, size/shape, or type of plant growth

The tomato, *Solanum lycopersicum* is native to South America, but was not known to be used there as a food. It was a food in Mexico.



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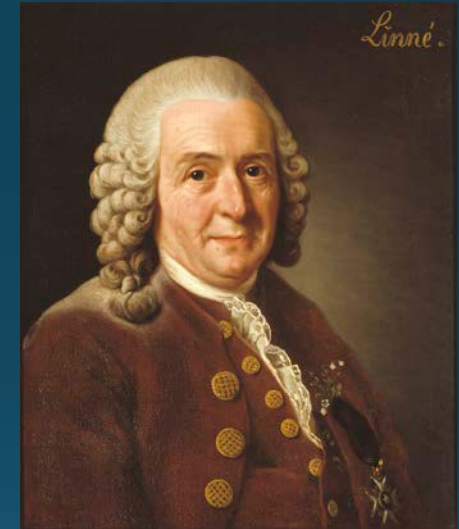
## Growing Tomatoes at Tahoe

Pliny the Elder ( 23-79 AD) is generally credited with providing the name to the genus *Solanum*. Two possible meanings – a. In need of sun; or b. Soothing



wikimedia

Linnaeus gave the species name, *lycopersicum* derived from the common name used in Germany and elsewhere (wolf peach)



wikipedia

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## Growing Tomatoes at Tahoe

### Defining Tomatoes

#### Tomato by color:

Red  
Pink  
Orange  
Purple or  
Blue/Black  
Yellow  
Green  
Striped

#### Tomato by plant growth:

Determinant  
Indeterminate  
Semi determinate



UC Davis Image

#### Tomatoes by size or shape:

Current  
Grape  
Cherry  
Plum  
Pear  
Standard  
Beefsteak  
Ox Heart

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## Growing Tomatoes at Tahoe

**Determinant varieties usually have more compact bush shapes and fruit ripen within a brief window, with plants dying shortly after fruit ripen. Sometimes called bush type tomatoes. Common type for processed tomatoes.**



Roma type determinant tomato  
UC Davis Image

**Indeterminate varieties are referred to as vine type tomatoes continue to grow, flower and produce fruit until killed by frost or lack of water. In southern climates may overwinter, or resprout from base.**



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## Growing Tomatoes at Tahoe

### Definitions

**Optimist – A Gardener in Tahoe/Truckee**

**Masochist – Someone attempting to grow tomatoes in Tahoe/Truckee**

**Sadist – Someone who successfully grows tomatoes in Tahoe/Truckee and who reminds you of it - regularly**



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## Growing Tomatoes at Tahoe

Select site that maximizes heat,  
daylight and protection



Planting next to a fence or wall (south or west side) allows for radiated heat at night

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## Growing Tomatoes at Tahoe



Trellised Rows of Heirloom Tomatoes  
TomatoFest Image

Soil pH of 6.2-6.8 (Tahoe/Truckee OK) gives best results. Prepare planting area by mixing in 2 pounds of 10-10-10 fertilizer per 100 sq. ft. If planting area is low in organic matter, add some well-aged compost to improve moisture holding capacity. If planting in raised bed or containers, consider adding some silica sand or perlite into the soil mix to help loosen the soil and allow better percolation of water.



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## Growing Tomatoes at Tahoe



Use of perforated plastic groundcover (clear or red) helps in raising and maintaining soil temperatures as well as help retain soil moisture



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## Growing Tomatoes at Tahoe



Bonnie Plants

**Darker colored containers help  
warm the soil**



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## Growing Tomatoes at Tahoe



Water storage systems are placed around or near plants for cold weather protection. A cheap system is to use plastic storage bags with colored water

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## Growing Tomatoes at Tahoe

Greenhouse Megastore Images



Frost Blanket

Tomato hood



Anchor pins



Insulated row cover  
with water bag

**Methods for frost or cool weather protection are important for tomato production in Tahoe/Truckee**

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## Growing Tomatoes at Tahoe

Support of vines essential



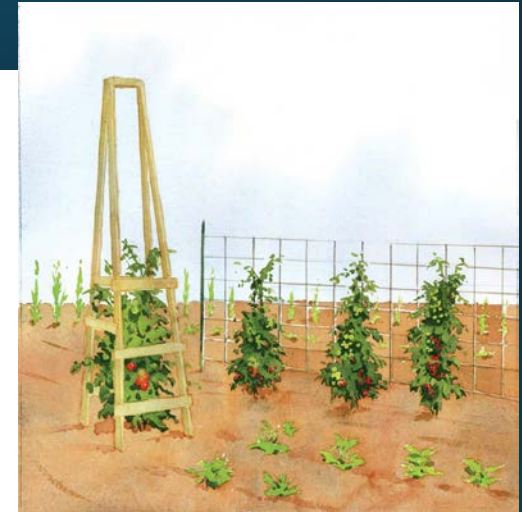
Bonnie Plants – Bamboo trellis



Bonnie Plants



Lowes Image



Mother Earth

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## Growing Tomatoes at Tahoe



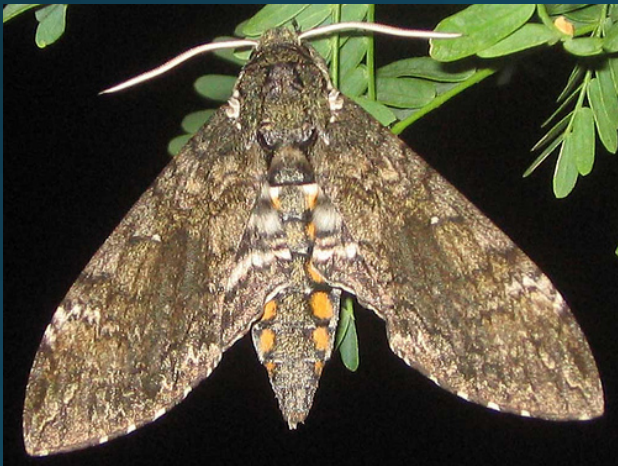
Harvest and year end issues: Pick tomatoes when fully ripe if possible. As cooler weather becomes the norm in the fall, consider picking fruit when partially ripe and ripening indoors in sunny area. Alternately placing in a paper bag with other fruit will sometimes speed ripening. Another method suggested by Gary Romano – (July and Winter) is to remove the whole plant minus roots and allow to ripen on a table.

**After Harvest, remove and dispose of all plants.**

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Gardening Know How image



Inaturalist image

## Growing Tomatoes at Tahoe

**Pests:** Aphids, cutworms, flea beetles and the ever frightening horn worms (Hawk moth) are the most common insect pests and can be controlled with good field sanitation, hand picking and encouraging beneficial insects. Every couple years there seem to be an issue with white flies. Both cutworms and horn worms can be biologically controlled with *Bacillus thuringiensis* containing baits or sprays. White flies and aphids can be controlled with soap sprays and horticultural oils.

**Birds, mice, squirrels are best controlled with exclusion systems.**



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## Condensed Tomato History

Spanish find tomatoes in Mexico used as food.

First reported in Europe in 1544 from Mexican seeds.

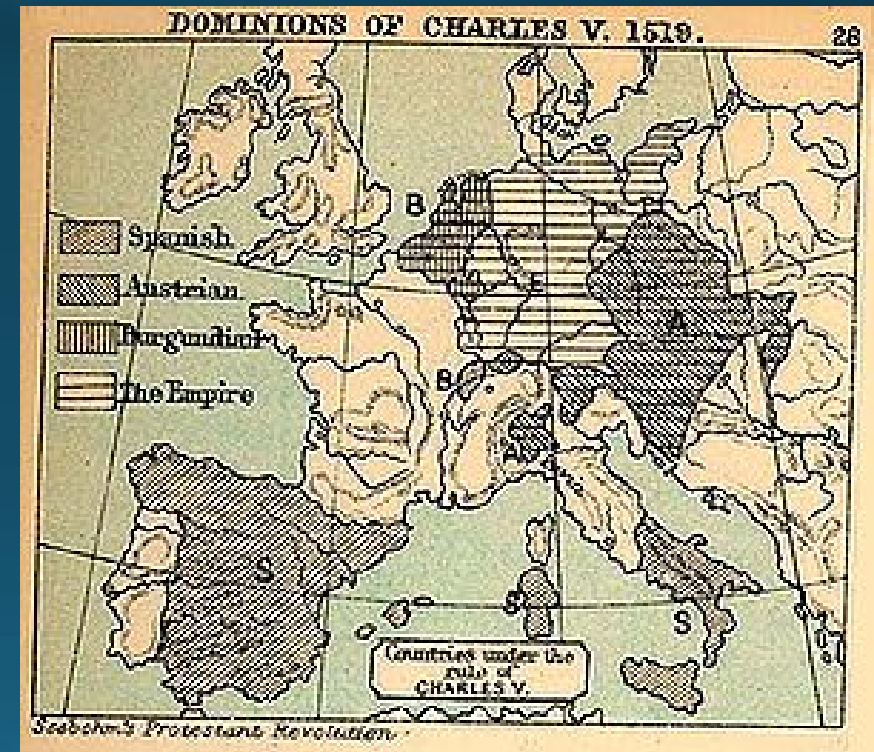
First tomatoes in Europe probably were yellow varieties (Pomodoro or Golden Apples).

Initially not well received, except in Spanish areas such as Italy (nightshade family). Called wolf peach in many parts of Europe, though Love Apple in England.

By 1800 Tomatoes are important in many dishes, salads and deserts

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## Growing Tomatoes at Tahoe





# Tahoe Fruit & Vegetable Workshop Series

## Condensed Tomato History II

## Growing Tomatoes at Tahoe

In the colonies and early US tomatoes were generally believed to be poisonous

Jefferson was aware of the food value from introduction to the fruit while in Europe

In 1819 Jefferson ate a ripe tomato to the astonishment of the Lynchburg populous

The southern states were first to grow and regularly eat tomatoes – due to proximity to Spanish areas where tomatoes were regularly consumed



# Tahoe Fruit & Vegetable Workshop Series

## Growing Tomatoes at Tahoe

### Condensed Tomato History III



While slow to gain acceptance as a food, tomatoes made “National News” as a medicine for all that ailed you. With Tomato Pills (containing the undefined extract tomatine).

In Hartford Connecticut (1839) as much as 30% of the entire newspaper consisted of tomato pill advertisements.

From the claimed health benefits, people started growing, consuming and enjoying tomatoes. Many recipes that originated in the south were published.

The fresh tomato demand led to inventiveness

And... the tomato surplus led to industrial opportunity

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## Condensed Tomato History IV

As the demand for fresh tomatoes grew after 1835 northeastern farmers looked at ways to be first to market where premium prices could be asked.

The yearly late season tomato glut often lowered pricing to less than the cost of growing.

The new industry of canning foods would make use of the inexpensive tomato excess.

Oregon State  
University image



## Growing Tomatoes at Tahoe

Farmers bought land in Maryland and Virginia and used new railways to ship partially ripened tomatoes to major cities

Arrangements were made to ship tomatoes via ship up the Mississippi to northern towns

They experimented with growing in hothouses, cold frames and hotbeds

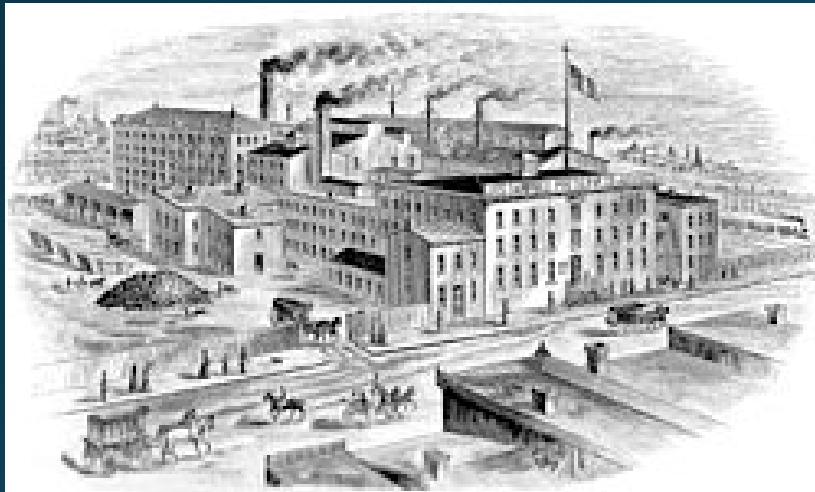
They also looked to earlier ripening varieties, and those that could transport well

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## Growing Tomatoes at Tahoe

### Condensed Tomato History V

Joseph A. Campbell  
Preserve Co. 1894



Campbell's Soup Company Image

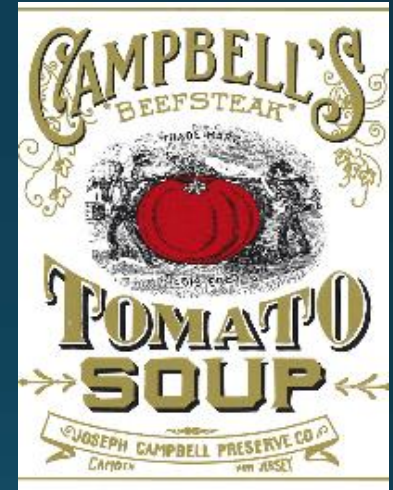
While tomato canning and bottling began in earnest in the 1840s the need for war rations during the Civil War set the stage for mass production

Joseph Campbell's started in 1869, changed name to Campbell's Preserve Company in 1876

1897 Campbell's condensed tomato soup introduced

1922 Campbell's Soup Co.

1931 M'm M'm Good jingle introduced





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## Growing Tomatoes at Tahoe

### Condensed Tomato History VI



Ketchup was a southeast Asian invention often fermented and containing fish, but used as a condiment, not needing refrigeration.

The first tomato ketchup (called love apples) based ketchup was an 1812 recipe by Englishman James Mease and contained brandy as a preservative

The modern Ketchup (spelled many ways) began appearing in the 1860s using vinegar and sugar as partial preservatives. The Heinz Co. out competed the Hazard Tomatoketchup based in part on purity

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## Growing Tomatoes at Tahoe

### Condensed Tomato History Epilogue

The need for uniformity in product quality and taste led to companies developing their own tomato varieties and paying farmers to grow under contract.

Most industrial tomatoes are determinate varieties that ripen uniformly

Besides taste and color, moisture/pulp ratios, size uniformity, and transportability are important attributes that the Flavr Savr tomato was designed to address

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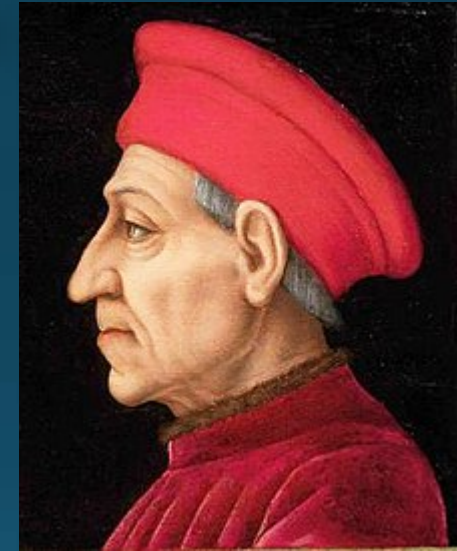
## Growing Tomatoes at Tahoe

### Tomatoes in Italy

The tomato sauces of Italy are famous worldwide, with the tomato an important ingredient in the cuisine of the country. The tomato's introduction to the Italian Peninsula date to October 31, 1548 (Before the country of Italy existed) . Seeds from Mexico were given to the Medici who had them grown on one of estates. The ripe tomatoes were brought to him while in Pisa. His response was ... Eh?

It is thought that the original Italian tomatoes were yellow - Pomodora

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Cosimo de' Medici  
Portrait by Brnzino



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## Growing Tomatoes at Tahoe

### Tomatoes in Italy II

By 1559, the conclusion of the Renaissance Wars, much of the Peninsula south of Naples was controlled by Spain. The tomato was introduced and gained acceptance in this part of Italy from recipes derived from Spanish and Mexican dishes.

The processing of tomatoes into a gravy became a staple commodity by the 1880s.



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## Growing Tomatoes at Tahoe

### Siberian Red tomato

A determinant plant that consistently produces fruit in cool weather situations (reportedly can set fruit to 38° F. Tomatoes are about 4 oz. in size, bright red and round. There is confusion related to this variety so it could be considered a Russian heirloom variety, or just a cool season variety introduced in 1984. 50-65 days from fruit set.



TomatoFest Image

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## Growing Tomatoes at Tahoe

### Alaska Fancy Tomato

This is a semi determinant plant that has small (1-2 oz.) red plum tomatoes. Plant can set fruit in cool weather and produces an early crop. 54 -60 days from fruit set.



TomatoFest Image



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## Growing Tomatoes at Tahoe

### Legend Tomato

This determinant tomato sets fruit in cool temperature. An interesting attribute is that it's a parthenocarpic, setting fruit without any pollination required. Developed by James Baggett at Oregon State University. The red fruit are 3-4 inches in diameter, round with few seeds. The plant is resistant to late blight. 66-70 days from fruit set.

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Oregon State image by Lynn Ketchum



Territorial Seed Image

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## Growing Tomatoes at Tahoe

### Sasha's Altai-Tomatoes

Another Determinant tomato plant. The plants are said to set fruit in cool high elevation situations. Originally from Irkutsk, Siberia, brought to US in 1989 The fruit is 4-6 oz. round to slightly round shape. 55-60 days from fruit set.



TomatoFest Image

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## Growing Tomatoes at Tahoe

### Silvery Fir Tree Tomato

Selected for trials based on early fruit setting and interesting foliage. Possibly from Russian origins. A determinant plant that produces 2 inch 4-5 oz. red fruit. A good choice for patio or container growing. About 54 days from fruit set.



Territorial Seed Image



TomatoFest Image



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## Growing Tomatoes at Tahoe

### **Pêche Jaune Tomato**

This is an indeterminate plant that produces a one inch round yellow fruit that has “slight fuzz”. The fruit is best eaten within a few days of picking, having mild flavor. Possibly a French heirloom variety dating to the mid 19<sup>th</sup> century and /or an original Pervian variety tracing back to the 1600s. 65-70 days from fruit set.



Tomatobomo image



TomatoFest Image

# Tahoe Fruit & Vegetable Workshop Series

## Tomatoes and Nutrition

## Growing Tomatoes at Tahoe

### Red Tomatoes

Medium size (200 gm)

### Yellow Tomatoes

38

Calories

32

2g

Proteins

2g

10%

Fiber (RDA)

6%

2%

Calcium (RDA)

2%

3%

Iron (RDA)

6%

5%

Phosphorus (RDA)

8%

14%

Potassium (RDA)

16%

11mg

Sodium

49 mg

48%

Vitamin C (RDA)

32 mg

2.4%

Zinc (RDA)

4%

7%

Vitamin D (Niacin)

13%

8%

Folates (RDA)

16%

35%

Vitamin A (RDA)

0%

5.4mg

Lycopene

0%

Prevention.com  
information from Nutrient  
Database for Standard  
Reference from USDA

# Tahoe Fruit & Vegetable Workshop Series

## Tomatoes and Nutrition

## Growing Tomatoes at Tahoe



Remember that undefined extract tomatine that was a cure all?

While the extract might have been bogus by the early 20<sup>th</sup> Century the carotenoid, lycopene, had been isolated in red tomatoes which may have some health benefits.

Lycopene availability increases with the cooking of tomatoes!

A 2010 review concluded that research has been insufficient to establish whether lycopene consumption affects human health.

More recent studies may indicate lycopene may assist in reducing the risk of heart diseases and certain cancers.



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## Growing Tomatoes at Tahoe



Gary and Dagma cleaning tomato seeds  
TomatoFest Image

Most home gardeners purchase plants for transplanting into their gardens.

Open pollinated varieties can be grown from retained seeds.

1. Squeeze seeds and juice from ripe tomato into container labeled with variety name
2. Set open container in warm dark location (expect flies and odor)
3. Allow mixture to sit until surface covered in mold (white or tan). You may need to add water.

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## Growing Tomatoes at Tahoe



Sunset Image

4. Scrape off mold
5. Fill container with water and stir slightly
6. Good seeds will sink
7. Pour off water and floating seeds retaining good seeds in container
8. Repeat washing until seeds are clean
9. Pour seeds onto a nonporous surface and spread in single layer
10. Allow to dry thoroughly.
11. Store in labeled container

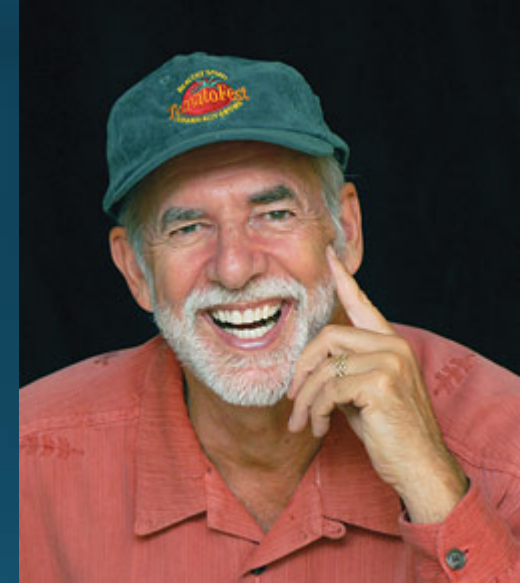
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## Growing Tomatoes at Tahoe



Dagma Lacey

**Gary Ibsen and Dagma Lacey operate TomatoFest farm where they grow 650 types of organic open pollinated heirloom tomatoes. While many are eaten and sold the main focus of the farm is seed sale. The farm started in 1991. Gary was also Executive Director of the Carmel TomatoFest celebrating the tomato.**



Gary Ibsen



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## Growing Tomatoes at Tahoe



Alisha Cahlan, Manager of the UNR High Desert Farming Initiative. The program supports small farmers in identifying and growing higher value crops in western Nevada.

The Tahoe Master Gardener vegetable growing workshops qualified for participation – Looking at high elevation issues of food production.

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## Growing Tomatoes at Tahoe



### Tomato Festivals Are Everywhere

Los Banos – October 2018

Central New York TomatoFest – Auburn NY, September 7-8

Red Fire Farm Tomato Festival - Gransby MA, August 2018

La Tomotina Festival – Brunel Spain, August 29, 2018

Woodland CA Tomato Festival – August 11, 2018

French Market Creole Tomato Fest – New Orleans, June 2018

Bradley County Pink Tomato Festival – Warren, AR June 8/9 2018



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## Growing Tomatoes at Tahoe

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