

Growing Vegetables and other fun foods

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Master Gardener Program



Why grow them?

- **World's Top Grocery Retailer in 2014.**
 - **Wal-Mart at \$327 Billion in sales*.**
 - **Kroger (King Soopers) at \$85 Billion*.**
 - **Safeway at \$37 Billion*.**
- **If Wal-Mart was its own economy, it alone would rank as China's eighth-biggest trading partner, ahead of Russia and Canada.**
according to China Business Weekly, Oct, 2008.
- **Top US Food Processing Companies*.**
 - **Tyson Foods.**
 - **Kraft.**
 - **PepsiCo.**
 - **Nestle.**
 - **Anheuser Busch.**

*Stores Magazine July 2014, www.stores.org



Why Grow Fruits and Vegetables

- **Satisfaction – Food Security**
- **Fresh food for the table.**
- **Winter use.**
- **To know where your food comes from.**
- **Chemical free.....**



Why Grow Fruits and Vegetables

- Fruits and Vegetables sampled for pesticides by the EPA in 2004.
- Number of Samples Analyzed = 10,366
- Number of Samples w/Residues Detected = 7,367
- Percent with Residue Detections = 71.1%
- Produce frequently tested positive for illegal pesticide residues: ginger from China; limes, papaya, summer squash, tomatillos, chili peppers and tomatoes from Mexico, and spinach and kale from the US.**
- **2014 California Depart of Pesticide Regulation testing.
- EPA Pesticide Data Program—Annual Summary, Calendar Year 2004, page 19

Why Grow Fruits and Vegetables

- **Ingredient costs are just 10% of the price of processed food.** March 31, 2011 Associated Press

- **Top Three Vegetable growing states:**

- 1-California
- 2-Florida
- 3- Georgia
- 4-Texas*

- **It's a long drive to a Wyoming table.**



- *Shipping is a terrible thing to do to vegetables. They probably get jet-lagged, just like people. ~Elizabeth Berry*

It's a long drive.

- **California produces.....**
- **84% of the country's fresh peaches 94% of the country's fresh plums.**
- **99% of the artichokes grown in the United States,**
- **94% of the broccoli.**
- **80% of the worlds Almonds.**
- **In spring, almost half of asparagus comes from California.**

FOOD SAFETY

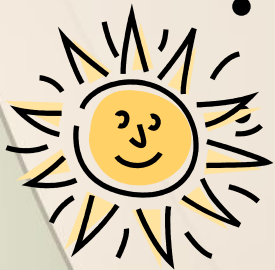
- **Fruits and vegetables can also cause food born illness.**
 - **Cool the fruit or vegetables asap.**
 - **Wash your hands min of 20 seconds/soap.**
 - **Gently clean under cold water.**
 - **Wash before you peel.**
 - **Toss the outermost leaves of lettuce or cabbage.**
 - **Store at 40 degrees or less.**

FOOD SAFETY - Manures

- **Don't use manure based compost or cow/sheep in a bag.**
- **EC level is unknown.**
- **Levels of NPK are unknown, may be high enough to damage plants.**
- **E-coli, Salmonella, Listeria.**
- **Weed Seeds.**
- **Tetanus.**

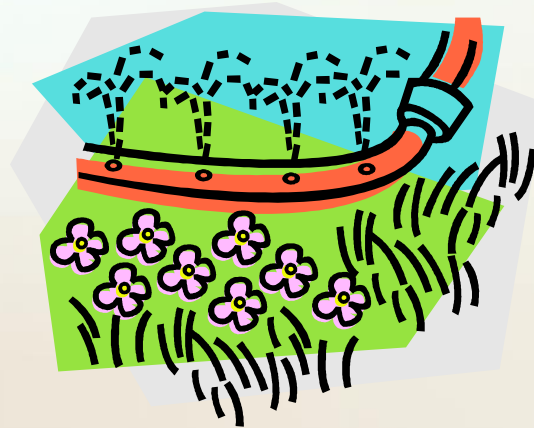
A Few Garden Rules

- Sandy loam soil.
- Working the soil.
- Warm soil.
- Lower pH.
- Watering.
- Fertilizer.
- Weeds.
- Mulch.★
- Wind.
- Sun.



Irrigation

- **The ultimate size of the crop is very much dependent upon proper watering at the right time.**



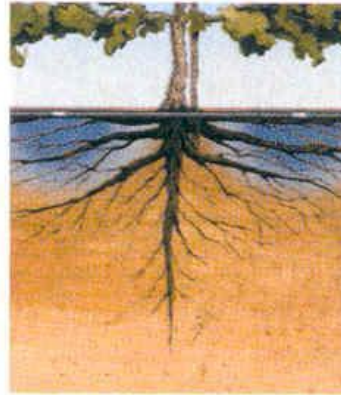
Irrigation

- Know your soil type:

- Clay.

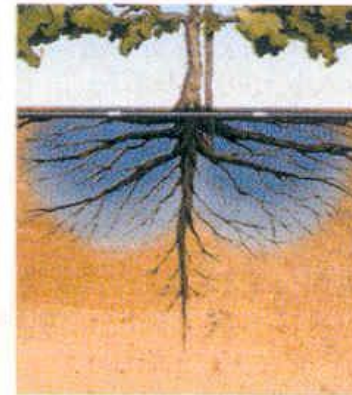
- Sand.

- Loam.



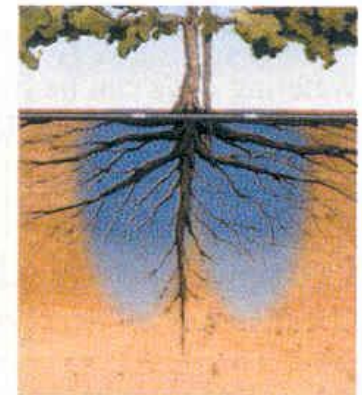
HEAVY CLAY SOIL

Low flow emitters are recommended. If a high flow emitter is used it may exceed the soil's ability to absorb water, resulting in runoff.



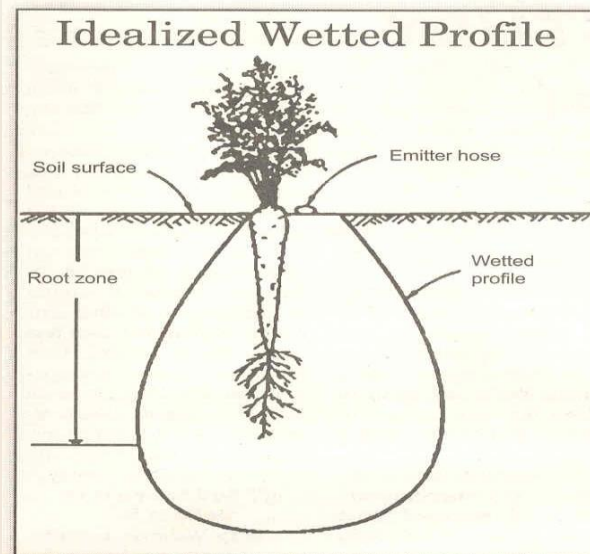
MEDIUM TEXTURED SOIL

Requires closer emitter spacing (compared to clay soil). Medium flow emitters are recommended.



LIGHT TEXTURED SOIL

Closer emitter spacing is required in order to uniformly wet the soil profile. High frequency irrigation can be used to achieve similar results.



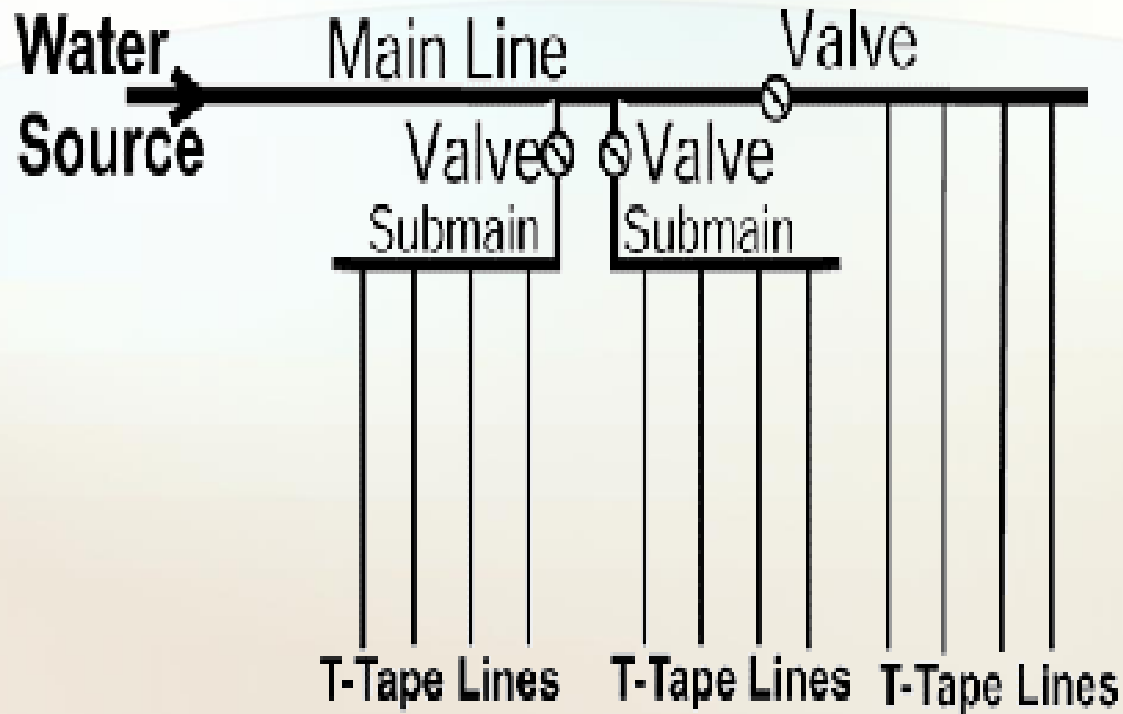
Soaker Hose



Drip Tape



Irrigation Valve System



Valve System



Timers, Gardeners Best Friend.



Designing a Garden



Designing a Garden

■ Site analysis

- Sunny location, 5-6 hours of sun per day.

East sun is best

- Well drained. Protected from the wind.

- Is it a microclimate area?

- What are the soils?

- ★ Convenience of location.

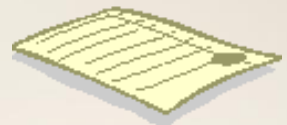
- Size of garden matches your time.

- Grow Vertical.



Designing a Garden

- What do you want to grow?
 - Make a list.
- **Plan your garden on paper first.**
- Watering method.
 - Drip, t-tape, soaker hose.
- Plan on a variety of plants in your garden.
 - Annual flowers to keep the pollinating insects around.
 - Orchard Mason Bees – Bumble Bees.



Garden design 1



Garden Design 2, Early July



Garden Design 2, Mid August



Garden #3



Garden #3



Garden Design #4



Garden Design #4



Weed Control

- **Black Plastic Mulch**
- **Straw or grass clipping**







Vegetables



Life expectancy would grow by leaps and bounds if green vegetables smelled as good as bacon.

- Doug Larson

Vegetables are a must on a diet. I suggest carrot cake, zucchini bread, and pumpkin pie. ~Jim Davis



“Carrots, tomatoes, lettuce!
And what’s wrong with
a few rows of cheeseburgers?!”

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“Are there any chocolate-flavored
vegetables?”

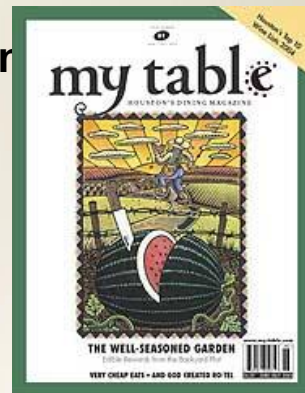
Fruits Vs. Vegetables

- **The differences between vegetables and fruits are not well-defined.**
- **Fruits are generally considered to be an edible part of a plant that contains seeds.**
- **Vegetables may include stems, roots, tubers, leaves, and other plant parts.**
- 1995-2004 by Michael W. Davidson and The Florida State University.



VEGETABLES

- **Over 200 types of vegetables have been categorized around the world.**
- **About 75 types growing throughout the United States.**
- **50 types are grown commercially.**
- **Estimated \$3 billion in seed sales in 2009, or \$125 per house hold.** Mailorder Gardening Association



Seed Stock

- **Open pollinated seeds**
 - **If pollinated by same species, should breed true.**
 - **Can be cross pollinated by other plants.**



Seed Stock

- **Hybrids**

- **Cross between two parents that give offspring with very uniform characteristics.**



- **Develop disease resistances.**
- **Increased earliness or yield, vigor.**



<https://gmoanswers.com/>

Seed Stock

- **Heirlooms**

- **Old types of plants that haven't undergone modern breeding.**
- **Grown and saved by the people who are using them.**
- **Uniqueness.**



Vegetables

- **Cool Season.**

- **Originated in temperate climates.**
- **Seeds germinate below 60° F; they don't grow well above 75° F or below 45° F.**
- **They can be hardy and withstand a frost.**
- **They can be planted four weeks before the last expected frost about mid-April.**

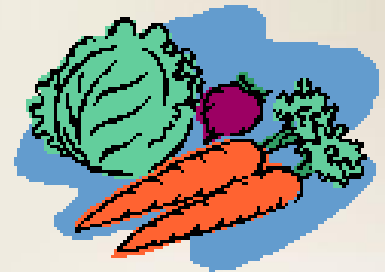
Cool Season Vegetables

- Broccoli Kale Peas Cauliflower
- Kohlrabi Radish Brussels Sprouts
- Cabbage Leeks Rhubarb
- Collards Lettuce Rutabaga
- Garlic Onion Shallots
- Parsley Spinach Turnips
-
- Also can be grown in shady locations.

Half Hardy- Vegetables

- Can be planted two to three weeks before the last frost in the early part of May.

- Beets, Carrots, Celery,
Parsnip, Potatoes,
Brussels Sprouts,
Chard, Rutabaga.



Warm Season Vegetables



- Crops that will not grow well when temperatures are below 70 degrees.
- NOT frost tolerant.

Cucumber

Sweet Corn (?)

Peppers

Squash

Tomato

Muskmelon

Eggplant

Okra

Pumpkin

Sweet Potato

Watermelon

Vegetables in Related Groups or Families

| Nightshade Family | Legumes | Cucurbits | Cole |
|--|---|--|---|
| Eggplant Potato Pepper Tomato | English peas Lima beans Peanuts Snap beans | Cantaloupe Cucumber Pumpkins Squash Watermelon | Broccoli Cabbage Collards Mustard Turnips |

Vegetable garden rotation should be with Families –three years

Estimated Days to Maturity

- Tomatoes 65 to 120 days.
- Corn 70 days +/-.
- Peppers 70 days or more.
- Winter Squash 80+ days.
- Pumpkins 80 –120 days.

**Germination time, plus
transplant adjustment time
can add another three to four
week to the harvest date.**



Or Time from Pollination to Harvest

- Beans 7–10 days
- Corn 18–23 days
- Cucumber 15–18 Days
- Peppers 45–70 days
- Pumpkins 80–100 days
- Summer Squash 5–7 days
- Tomatoes 35–60 days

What to Plant



- What you will **eat**.
- What is **needed**.
- What the **family** will eat.

DENNIS THE MENACE



"SEE, MOM, EVEN OL' RUFF WON'T EAT BROCCOLI!"

ZITS



I want to grow my own food, but I can't find any bacon seeds.



Asparagus, What to Grow

- Jersey Giant and Jersey Knight
 - Best yielding.
 - Adapted to colder climates.
 - All male varieties.
 - Longer lived.
 - Yielding more.
- California produces more than 70% of this country's 200,000 pounds of **fresh** asparagus in the San Joaquin/ Sacramento delta area per year.



Asparagus

**Need to wait 2-3 years
after planting to harvest.**



- If it develops a crooked stem after it emerges from the soil, could be the asparagus beetle or slugs on one side of the stem, could be the wind blowing sand against the stems and rupturing the cells causing it to lean into the wind.
- Water after the harvest is over when the fernlike foliage is growing.

Beets

- Do best in well-drained soil with a pH of 7.0.
- pH below 6 creates stunted growth.
- Fertilize with 5-10-10.
- Sow from the last week of April to mid- May+.
- $\frac{1}{4}$ oz. of seed = 25' row, $\frac{1}{2}$ deep, 4" apart.
- Days to Maturity: 50-70.
- Expected Yield: 25-30 pounds/25 foot row.

Beets

Too much nitrogen, seeding too thickly without thinning, or planting in hot weather = lush top growth and little root development.

They are best when they grow quickly in constant cool conditions.

Tops of beets, “greens” throughout the season.

White and Gold Beets can be sweeter or spicier than Red Beets.



Beans

- Over 1,500 varieties, hard and snap.
- Beans are very sensitive to high salts.
- Beans have a shallow root system and are susceptible to drought.
- Excess water during flowering can also decrease pod set.
- Beans generally do not do well following cabbage and related crops.



Beans



- **Inoculation is a must.**
- **To be effective the inoculants must cling to the seed to ensure the rhizobia is close to developing roots.**

Beans

- Needs potassium boost mid-season.
- Hot, dry or cool wet weather may cause beans to drop blossoms.
- Warm season crop; not frost hardy, Most desirable temperature for growth is 70 F.
- Expected yields: 20-30 pounds/25 foot row.

Broccoli

- **Needs; cool soil, cool growing conditions.**
- **Best when daytime temperatures are between 65 and 80 F.**
- **All Cole crops are frost tolerant.**
- **Best when set out as transplants rather than planted from seed.**
- **Fertilize with 5-10-5.**
- **15 plants = 12-20 pound yield.**
- **James D. Utzinger Ohio State University Extension Fact Sheet.**

Cabbage

- Likes cool weather.
- Plant 12 to 15 inches apart or more.
- Plant where it won't have to take the full heat of the day.
- The head size of cabbage is determined by the variety, fertilizer, and spacing between plants. 15 plants = 35 pound yield.
- Fertilizer 10-20-10 before planting, then side dress with Ammonium Sulfate 4-6 weeks later at 1 pound per 100 feet.

Carrots

- High nitrogen, heavy or rocky soils, low fertility and crowding can lead to stubby short root or split roots.
- Hot weather may stunt their growth.
- Knobby roots indicate nematode problems.
- Water when the soil starts to dry out.
- Over 70 varieties, 60-90 days to maturity.
- Washington State is #1 in carrot production.
- Expected yields: 20 pounds/25 foot row.



Cauliflower

- Like shade and cool growing conditions.
- Prefers cool temps of 60-65°.
- Bitter flavor may be from low fertility or hot weather.
- Set plant 18 inches apart.
- Fertilize with 5-10-10, three weeks later fertilize with a small amount of nitrogen.

Sweet Corn

- **Plant when soil temperatures are between 50 and 85F. Check Variety!**
- **Sandy loam soil, pH 6-5.**
- **1-2 inches of water per week.**
- **Fertilizer 10-10-10 or 20-20-20.**
- **1oz. Seed/25'row =30-40 ears 70-100 days to maturity.**

Why is it not wise to tell secrets in a cornfield?

There are too many ears.

Sweet Corn

- "Cool conditions through pollination means all of the kernels will pollinate." ¹
- "The No. 1 yield killer from high heat is inability to pollinate. ¹
- The second yield killer is kernel rejection due to lack of water to keep up with water demand caused by heat."¹
- Tasseling while the corn stalk is still very short is caused by lack of N or not enough water.
 - Has a high water requirement.
 - Roots are shallow.
 - Is not drought tolerant.



Sweet Corn



- Under good growing conditions, an ear of corn will form for harvest 20 days after silk is showing.
- Corn is wind-pollinated, corn will cross-pollinate with field corn, popcorn, and your neighbor's corn.
- Needs more water when tasseling and as cobs develop.



Cucumbers



- Does not tolerate a **frost**.
- 50 to 70 days.
- Over 100 varieties.

- Needs warm soil 70° to germinate.
- Long warm days 80 degrees, plenty of sunshine and balmy nights 65 degrees.

- Dependent on insects for pollination.

Cucumber



- **Drought conditions, hot weather bacterial wilt or cucumber mosaic, few bees, may lead to deformed fruit.**
- **Vines that suddenly wilt and die - a bacterial introduction by the cucumber beetle.**
- **Fertilizer of 5-10-5. One week after blossoming begins, and again three weeks later.**
- **Expected yields: 30 pounds/25 foot row.**

Eggplant

- Is sensitive to temperature, cool night temp early in the season prevent fruit set.
 - Hot, dry winds in midsummer may prevent pollination, low soil fertility can also reduce fruit set.
 - Needs plenty of moisture, mulching is helpful.
- 15 plants = 25 pound yield.**



Garlic “So many garlic's. . .So little time”

- Over 240 varieties. *Allium family*
- Two main categories: Hard neck or Soft neck.
- Classified as: elephant, artichokes, silver skins, porcelains, turbans, purple stripes, rocamboles, Asiatic.
- Herb of the Year in 2004.





Garlic - Two Types

HARDNECK/ ROCAMBOLE GARLICS

- “This is where the *real* flavor is,” say garlic aficionados.
- **May have fewer cloves.**
- **The cloves are larger and easier to peel.**
- **The tall scapes, when cut, make a great stir fry.**
- **A half pound will provide cloves for between 15-20 plants.**



Garlic - Two Types

SOFTNECK GARLICS

- **Soft neck garlic is sometimes called "common" garlic.**
- **Soft neck varieties are *easy to grow* and tolerate a wide variety of climate conditions. Bulbs can be large.**
- **They can have a shelf life up to 9 months.**
- **Planted bulbs generally yield 5-8 times their weight at harvest. A half pound will provide cloves for 20-30 plants.**

Garlic

- **The hard neck garlics especially do well in colder climates. Some thrive on being in the ground during very cold winters.**
- **pH 6.2 to 6.8 range.**
- **Plant 4 to 6 weeks before the first frost. Average first frost Sept 25.**

Garlic

- Plant about 2 inches below the soil surface.
- 4 to 6 inches apart.
- Fertilize with 10-10-10.
- Mulch, a key element to real garlic success.
- Likes Moist soil.
- **Stop watering** in mid-June, to avoid fungus problems.





Leeks

- **Over 50 varieties.**
- **Is a member of the lily family.**
- **Temperature for growth 55–75F.**
- **Fertilizer 10-20-10 or 10-10-10.**
- **Plant 4-6 inches deep 2-4 inches apart.**
- **Growing season of 120-150 days.**

Lettuce

- **Lettuce has been grown and used by the Greeks and Persians since 500 B.C.**
- **381 Varieties of lettuce.**
 - **40 to 70 days.**
 - **Cool Soil, Cool Temps.**
 - **Fertilizer 10-10-10.**
- **Crowding, low fertility, late planting hot weather all stunt growth and cause lettuce to be bitter or tough.**

Muskmelon

- Numerous botanical varieties of muskmelons including: netted melons, cantaloupe melons, (casaba) melons, snake or serpent melons, and mango or lemon melons.
- Fertilize early in the season, but not when fruit development begins, too much fertilizer produces vines, leaves, and no fruit.
- Black plastic mulch to get them going.

Muskmelon, when to pick

- **The slipping of the stem from the melon with slight finger pressure is an excellent indicator of melon ripeness.**
- **The fruit will show a change of color from green or olive-grey to yellowish brown should be considered ready to harvest.**
- **James D. Utzinger, William M. Brooks, and E.C. Wittmeyer, The Ohio State University, Department of Horticulture.**

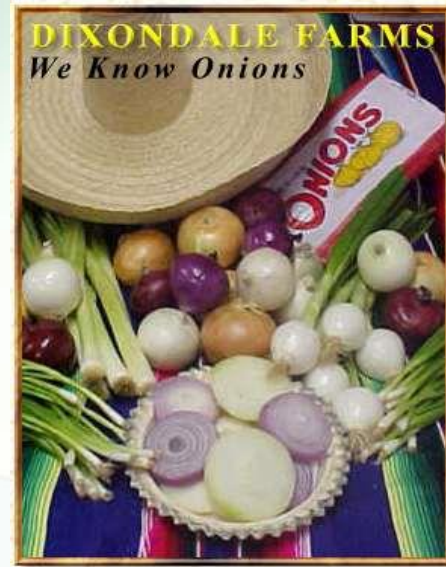


Okra

- Plant in warm soils.
- Soil pH of 6 to 7.
- Fertilize with 5-10-10
- Harvest pods when 2"-4" long.
- Do not let pods become over mature.
- Several short season varieties.
- Can be frozen, canned or pickled.



Onions



- Top 10 vegetable produced in the U S, with 142,000 acres for six billion pounds are produced. We eat about 20 pds/person/year.
- Day-length is necessary for bulb formation.
- Temperatures $>75^{\circ}\text{C}$ start bulb thickening.
- Can withstand temperatures as low as 20°F .
- Short-day, Intermediate-day and long day varieties.

Onion Types



- *White Granex* - This variety has the same characteristics as the yellow granex but with pearly-white flesh.
-
- *White Bermuda* - An old variety, White Bermuda's are also known as Crystal Wax and produce *thick, flat* bulbs that are extremely mild. However, they do not store well.
-
- *Burgundy* - A sweet variety for those who prefer a red-skinned onion.



Onions

- Fertilizer: 10-20-10.

Plant onions 4-5" apart.

- 3-weeks after planting fertilize again, but Stop fertilizing your onions about a month prior to harvest, or when they start to bulb.

- Tops of onion should fall over naturally to close the neck off.

Avoid overhead irrigation.

- Information from Dixon-dale farms



Onions



- Need micronutrients such as:
Magnesium, zinc, boron, copper, iron,
manganese and molybdenum.
- Without this they can have:
Slow growth, tip yellowing, twisting of the
leaves and smaller yields.

The Vidalia onion

- **A yellow granex hybrid known for its sweet, mild flavor.**
 - **Their mild flavor is due to the unique combination of soils and climate.**
 - *Georgia's Official State Vegetable.*
 - **Onion Festival held in April.**



Onions – Walla Walla

- **Started in the 1800's when a French soldier brought onion seeds over from France and planted it in Walla Walla, Washington.**
- **Mild climate.**
- **Rich volcanic soil.**
- **Can weigh up to 2 lbs.**

Onions - Shallots

- Considered to be the gourmet member of the onion family due to its mild, delicate flavor.
- A shallot is a member of the multiplier-type onion family which lives for many years.
- It is made up of segments called cloves.
- The plants will grow to be about 18 inches tall and often bear white or violet flowers in early summer.

Onions – Bunching (*Allium cepa* Cepa)

- Bunching onions are generally classed as multipliers because they propagate themselves.
- Also know as Scallions.
- They are cold resistant and can be grown during winter.
- They **will not** bulb, are harvested as needed, using both the root and the tops.

Onion Laws:

- **In Tamarack, Idaho, no one can buy onions after dark without a special permit from the sheriff.**
- **In Rock Springs, Wyoming, a man isn't allowed to chew on chunks of a raw onion while driving a pickup down the street.**
- <http://aggie-horticulture.tamu.edu/plantanswers/publications/onions/onionlaws.html>

Peas

- Peas are very sensitive to fertilizer injury.
- May not be necessary to fertilize.
- Peas should be grown only once every 4 to 5 years on the same land to avoid buildup of soil-borne pathogens.
- Flowers are typically self-pollinated.
- Plants *are very* sensitive to drought.
- ★ Plant when the soil temp is around 45 degrees.
- 2 oz./25' row = 6-10 pounds shelled.
- Frost-hardy, cool-season.



Peppers (aka Chilies)

- Over 1,500 pepper varieties available with some estimates close to 2,000 varieties.
- Peppers are rich in Vitamins A and C. Vitamin A is the most abundant in fresh red peppers.
- *More chilies or peppers are grown and processed in Southern New Mexico than in any other area of the world.*

Peppers

All peppers will change to **Red** as they become mature.

Can be fussy to grow!

- Will not with stand a *frost*.
- **Will drop cold injured blossoms and revert to a growth state.**
- **Can be stunted by transplant shock.**
- Dr. Charles Marr, Horticulturist, K State.

Peppers

- **Soil Temperature of 80F day, 60+ at night.**
- **Fertilizer of 5-10-5**
- **Self-pollinated.**

Peppers -Types

- **Bell**
- **Pimento**
- **Sweet Wax**
- **Anaheim or Long Green**
- **Jalapeño types**

Peppers -Types

- Anaheim

Named after the California city, generally mild, is one of the most commonly available chilies in the United States.

Ancho

The rich, slightly fruit-flavored Ancho is the sweetest of the dried chilies.



Peppers - Types



- Habanero

This distinctively flavored, extremely hot chili is small and lantern-shaped.

- Jalapeno

These smooth, dark green (scarlet red when ripe) chilies range from hot to very hot.



Peppers -Types

- **Poblano**

A dark (sometimes almost black) green chile with a rich flavor that varies from mild to snappy.



- **Serrano**

A small (about 1-1/2 inches long), slightly pointed chile that has a very hot, savory flavor.



Peppers



- **Hatch, NM. Farmers have been growing chilies in the Rio Grande valley for 400 years. More than a dozen varieties are grown near Hatch, renowned as the chili capital of the world.**
- **First weekend of Sept.**



The Chili Pepper Food Festival in Bowers Pennsylvania!

Potatoes (*Solanum tuberosum*)

- **Native to South America.**
- **In cultivation for the last 7,000 years.**
- **Heirloom.**
- **Peruvian.**
- **European.**
- **Asian.**
- **Fingerlings.**
- **New Cultivars.**
- *More potatoes are grown in Idaho than anywhere else in the world.*





Potatoes

- **Season Length**

Early Season 65-80 days.

Mid Season 80-90 days.

Late Season 90-110 days.

- **100 varieties sold via growers.**

- **4,000+ different species of potatoes worldwide.**

Potatoes

- **Types of Potatoes.**

Fingerling,

Round,

Long,

Oblong,

Oval,

Oval Flat.

Potatoes



- **Use only certified seed, they will be free of disease.**
- Planting too deep may cause them to rot.
 - Manure in the soil might cause scab (bacteria).
 - Sandy to sandy loam soil.
 - pH between 5.0 and 7.0.
- Water needs are huge.



Potatoes

- Fertilizer 20-20-20.
- Use half the fertilizer when you prepare the soil.
- Then, halfway through the growing season, add the other half of the fertilizer through irrigation
- An average yield is 10 pounds harvested for every one pound planted.
- www.potatogarden.com

Potatoes

- Potato Tubers generally form around and above the seed piece, not below.
- A deeper planted seed requires less hilling but maybe more digging during harvest.
- Potatoes use 1 to 2 inches of water per week.
- Water the potatoes as evenly as possible. This helps the tubers to have uniform shape and helps make a better yield.



A potato bag—a unique way to grow potatoes.



Pumpkins



Pumpkins



- **Warm-season vegetable. Veining or Bush type.**
- **80 to 140 days to maturity.**
- **Very tender, seeds do not germinate in cold soil, injured by frost.**
- **Bees, are necessary for pollinating.**
- **Need lots of room to grow up to 30 feet.**



Rhubarb



- **2700 BC in China, was cultivated for medicinal purposes.**
- **Set out crowns in early spring so tops are covered with one inch of soil.**
- **Cool Season perennial.**
- **Fertilizer of 10-10-10.**
- **Flowering will reduce the vigor of the plant.**
- **Rhubarb is a vegetable.**

Strawberries



- **California is the 1# producer of strawberries in the US at 83% of the countries crop.**
- **Are America's favorite small fruit at 7.5 pounds per person.**
- **The US produced 2.29 billion pounds in 2006.**
- *China is followed by the United States and Spain in production of strawberries.* Matt Milkovich Vegetable Growers News, May, 2007.

Strawberries 3 Types

- 1-Fruits of day neutral plants and ever bearers are usually smaller than June-bearers fruit.**
- 2-Ever bearing strawberries produce three periods of flowers and fruit & do not produce many runners.**

Strawberries

- **Plant strawberries as soon as the ground can be worked in the spring.**
- **6+ hours of sun.**
- **1 inch of water/week.**
- **10-10-10 fertilizer.**

Strawberries

- **At peak in 2nd and 3rd years.**
- **Stagger planting years so always at the peak.**
- ***Avoid* areas where Tomatoes, Potatoes, Eggplant or Peppers have grown within the last couple of growing seasons.**
- **Varieties: Ft. Laramie, Ogallala, Ozark Beauty.**

<http://www.urbanext.uiuc.edu/strawberries/growing.html>.

Tomatoes

- **The tomato is native to the Americas.**
- **Per the US Supreme Court near the end of the nineteenth century, the tomato is legally a vegetable.**

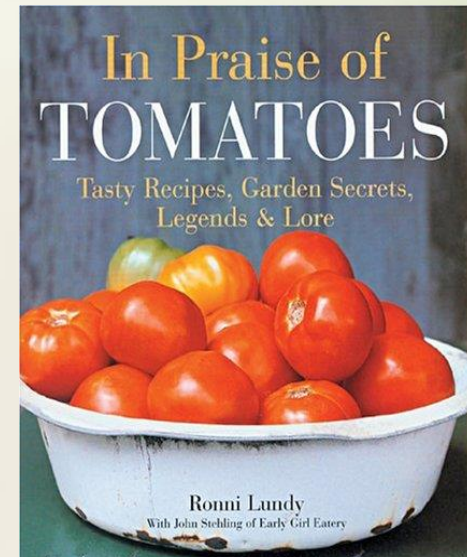
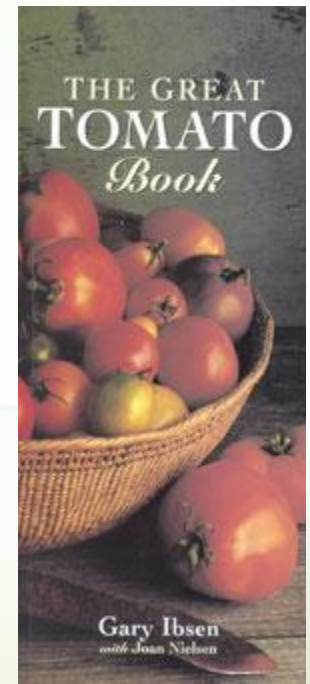
Botanically a fruit.

Tomatoes

- Over 3,000 varieties.
- Red, Pink, White, Yellow, Green, Black.
- Heirloom or Hybrid.
- Cherry, Grape, Salad, Sandwich, Paste, Beefsteak.
- *Standard tomato plant should yield 10 to 15 pounds or more.*

Tomatoes

- Indeterminate or determinate.
- Growing season 50 to 100 days.
- **warm-season plants.**
- fertilizer, such as 5-10-10, 5-20-20, or 8-16-16.
- **Drip irrigation is best**
 - **NEVER** WATER OVERHEAD



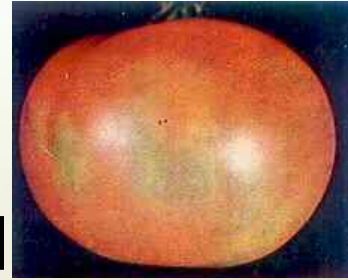
Tomatoes

- Hybrid tomatoes are more disease resistant, more vigorous, and improved fruit quality.
- Too much nitrogen produces leaves, reduces fruit.
- Temperatures too high (>90) or too low (<60) will prevent fruit from developing or the flowers to drop off.
- **Do not let them wilt.**



Tomatoes

- **Soil Fertility and Fertilizer will influence tomato quality.**
- **Potassium, color and water movement into the fruit.**
- **Sulfur for flavor.**
- **Boron helps with uneven ripening and prevents fruit cracking.**



• Joseph Heckman Rutgers University soil fertility specialist. Vegetable Grower News, August 2009, page12.

Tomatoes- Trouble-shooting

- **Blossom drop** can occur in early spring when daytime temperatures are warm, but night temperatures fall below 55 degrees as well as in summer, when days are above 90 degrees and nights- are above 75 degrees.
- Night temperature-critical factor in setting tomato fruit, the optimal range being 59° to 68°F.



Tomatoes- Trouble-shooting

- **Blossom end rot** moisture fluctuation, especially low soil moisture following abundant soil moisture, low calcium levels.
- **Epsom** salts is a good source of magnesium essential to good plant growth.
- **Gypsum** is a good source of calcium, calcium sulfate, but will increase salts over time.
 - Calcium to magnesium should be 10 to 1.

Tomatoes – Trouble-shooting

Over-watering causes lower foliage yellowing and wilting – this can also cause flare-up of any of the many root-rotting diseases to which tomatoes are susceptible.

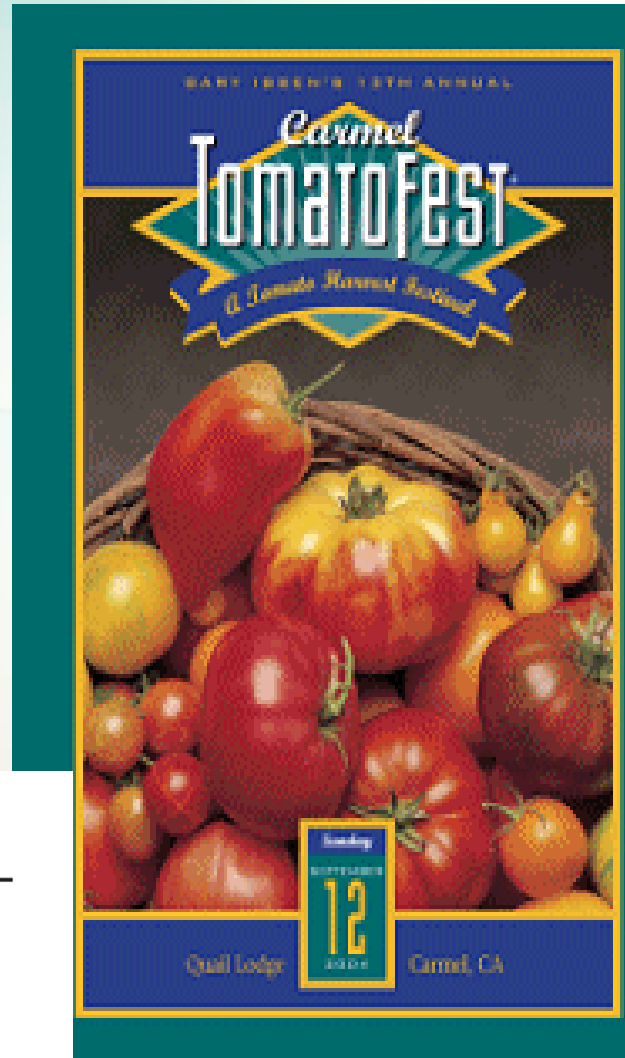
Salt damage— symptoms include burned roots which **can't** take up water or nutrients, wilting, yellowing, and marginal leaf burn.

Tomatoes

- **Late season yellowing of leaves.**
 - **Possible Nitrogen deficiency.**
- **Fruit poor quality and showing internal yellowing or white.**
 - **Possible low potassium levels.**
- **Brown dried leaves.**
 - **Possible general nutrition deficiency.**

Tomatoes

- **Carmel Tomato Fest®**
California, second Sunday
of September.
- **One of many.**



Squash two types

- Squash plants have male and female blossoms on the same plant (Monoecious).
- **Over 300 + varieties of squash.**

The male blossom is borne on a slender stalk.
The female blossom has the swollen embryonic fruit attached at its base.

The blossoms of both sexes are only fertile during the morning hours.

Need the Squash Bee for pollination.

Squash

- **During this time pollen must be transferred by bees.**
- The female blossom will close without being fertilized, the squash will not enlarge and in a few days it will drop from the plant to the ground.
- The male blossom, may open a second day but the pollen will no longer be fertile.

Watermelon

- Watermelon is thought to have originated in the Kalahari Desert of Africa.
- China, the world's number one producer of watermelons.
- The United States currently ranks fourth in worldwide production of watermelon.

Georgia, Florida, Texas, California, Arizona a \$492 million/year business.*

- There are about **100+ varieties** of watermelon throughout the U.S., classified into four general categories: All Sweet, Ice-Box, Seedless, and Yellow Flesh.

Watermelon



- **85 to 90 days.**
- **5 to 50 pound fruit.**
- **Needs warm to hot soil to grow in (80-85F). Use black plastic.**
- **Fertilize with 10-20-10.**
- **Don't let them dry out.**

Mid-Season – Garden

It's not over!

- **July:** Beets, Carrots, Cauliflower, Swiss Chard.
- **August:** Cabbage, Lettuce greens, Spinach.
- **September:** Carrots, Peas, Radishes, Garlic.

Arugula: 25 (for baby leafed) to 55 days

Asian Greens: 45 to 65 days

Beets: 45 to 55 days

Broccoli: 60 to 80 days

Carrots: 45 to 75 days

Collards: 50 to 65 days

Green Onions: 50 to 60 days

Herbs: varies

Kale: 30 to 60 days

Kohlrabi: 40 to 80 days

Lettuce: 25 to 60 days

Radishes: 10 to 50 days

Spinach: 25 to 50 days

Swiss Chard: 25 to 60 days

Turnips: 30 to 75 days

Final note

- **Method Soap Factory roof top garden of 75,000 sq. ft. largest green house roof in the world.**
- **Grows 1 million pounds of produce annually.**
- **Located in Chicago!**

Have a Great Growing Season



In Memory 1992 to 2008 ♡