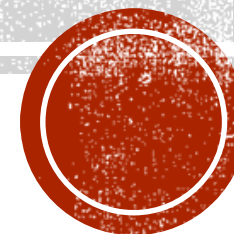


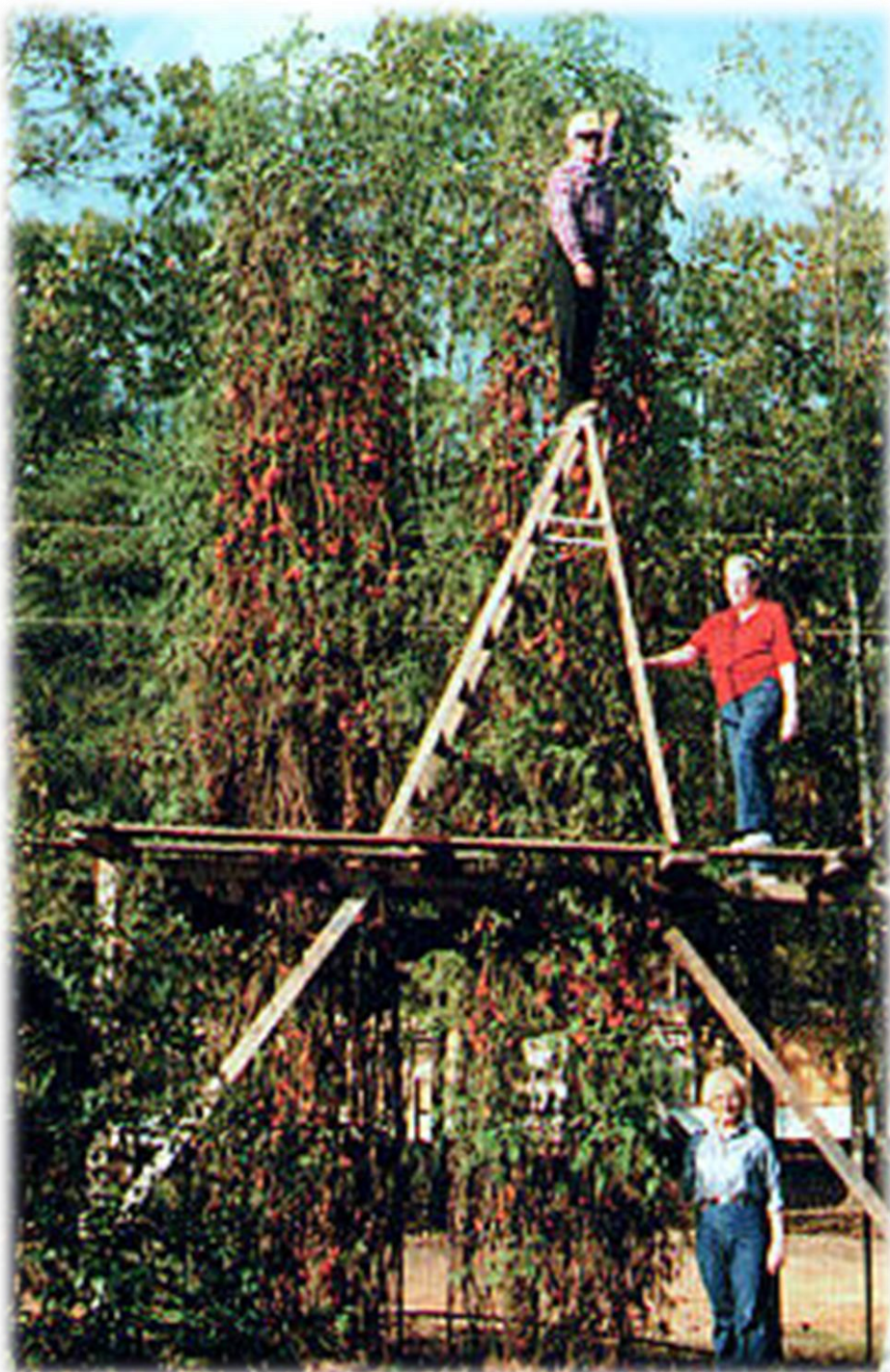
TIPS FOR GROWING TASTY TOMATOES

Larry Williams

UF/IFAS Extension Agent

Okaloosa County





EXPECTATIONS FOR TOMATO PRODUCTION IN FLORIDA



THE REALITY OR CHALLENGES OF GROWING TOMATOES IN FLORIDA

- *Temperature Extremes*
- *Moisture Extremes*
- *Humidity*
- *Sandy Soil*
- *Light Exposure*
- *Pest Pressure*
- *Plant Competition*



SOLANACEAE FAMILY

Family includes:

- **Tomato (Mesoamerican)**
- **Pepper (Mesoamerican)**
- **Eggplant (Asian)**
- **Potato (Andean)**
- **Tobacco (Mesoamerican)**
- **Petunia**
- **Nightshade: eastern & bitter black**



ROTATE PLANT FAMILIES

Apiaceae (Parsley) Family

- Carrots
- Celery
- Cilantro
- Fennel
- Parsley
- Parsnips

Asteraceae (Aster) Family

- Endive/Escarole
- Lettuce
- Sunflower

Brassicaceae (Cole) Family

- Broccoli
- Cabbage
- Cauliflower
- Chinese Cabbage
- Collards
- Kale
- Kohlrabi
- Mustard
- Radish
- Turnips

Chenopodiaceae (Goosefoot) Family

- Beets
- Chard
- Spinach

Convolvulaceae (Morning Glory) Family

- Sweet Potato

Cucurbitaceae (Mellon) Family

- Cantaloupe
- Cucumber
- Pumpkin
- Squash
- Watermelon

Fabaceae (Pea/Bean) Family

- Peas
- Runner beans
- Bush beans
- Fava beans
- Garbanzo beans
- Peanuts

Liliaceae (Lily) Family

- Garlic
- Chives
- Leeks
- Onions

Malvaceae (Mallow) Family

- Okra

Poaceae (Grass) Family

- Barley
- Corn
- Millet
- Rice
- Rye
- Wheat

Rosaceae (Rose) Family

- Strawberry

Solanaceae (Nightshade) Family

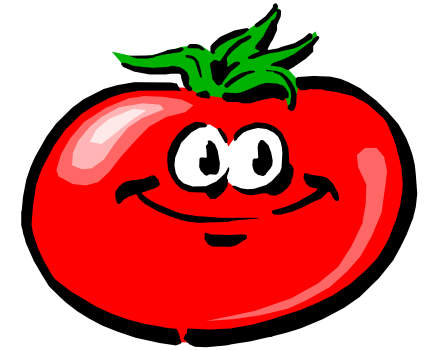
- Eggplant
- Pepper
- Potato (Irish)
- Tomato
- Tomatillo



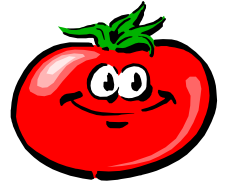
Plant Growth Habits

Determinate

- Flower clusters produced with only one or two leaves (nodes) between them
- After several clusters shoot will terminate in an inflorescence (flower cluster)
- Tend to be smaller plants that are suited for caging or sprawling
- Fruit tends to ripen all at once



Plant Growth Habits

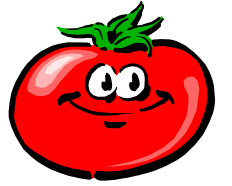


Indeterminate

- Three to four leaves are produced between flower clusters
- Shoot does not terminate in flower cluster
- Since plants continue to elongate they are larger and tend to get viney if not pruned
- Suited for staking and caging
- Fruit ripen throughout the growing season
- ISI Indeterminate Short Internode varieties with the controlled growth habit of a “determinate” with the unlimited production potential of an “indeterminate”



Plant Growth Habits



Determinate



Indeterminate



DETERMINATE GROWTH HABITS



INDETERMINATE GROWTH HABITS





POLLINATION

- Self-pollinated (agitation)
- Anthers start releasing pollen mid-morning (10 am – 2 pm)
- Rainy conditions or late dew persistence can cause pollination problems

Largely self-fertilized and primarily wind pollinated

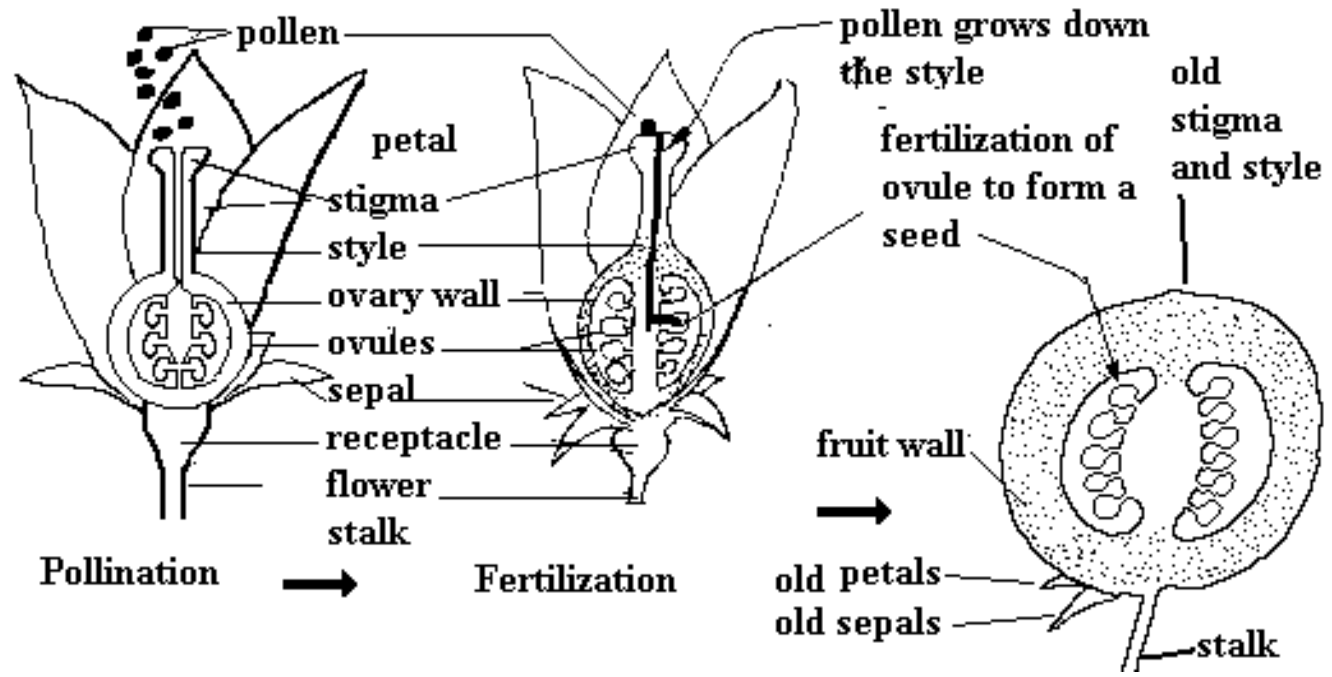
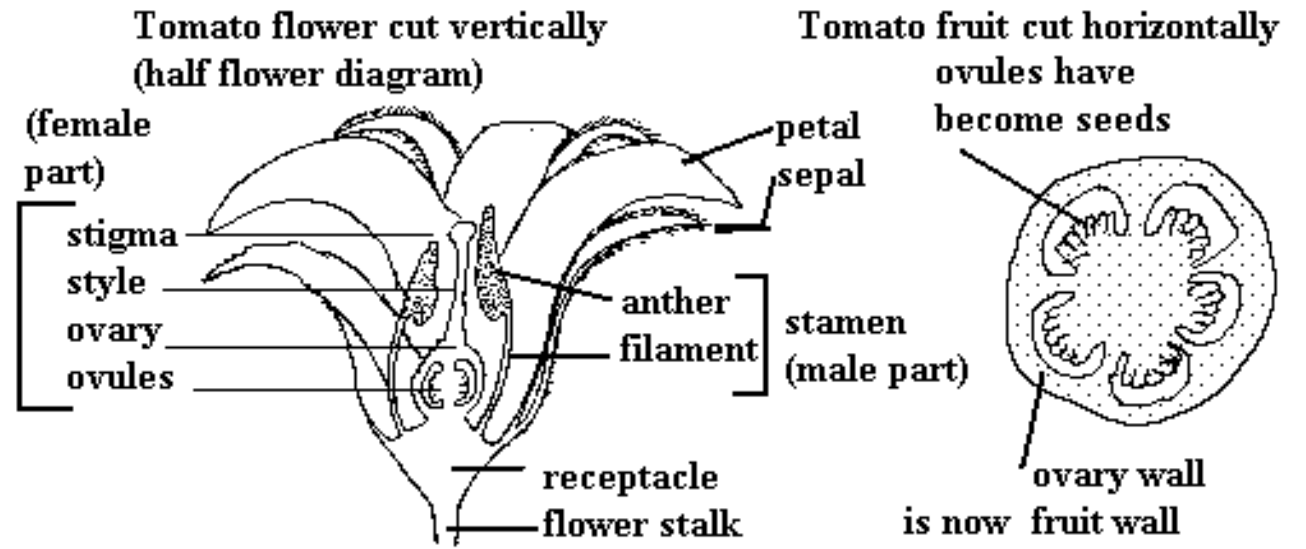


FERTILIZATION (EGGS)

- Pollen germinates to form a tube that grows to ovule (egg)
- Fertilization must take place within 24 hours of pollination
- Low (< 50) or high (> 70) night temperatures can slow down pollen tube growth and prevent fertilization



POLLINATION & FERTILIZATION



Pollination

Pollination is process by which pollen is transferred from anther (male part) to stigma (female part), thereby enabling fertilization and reproduction.

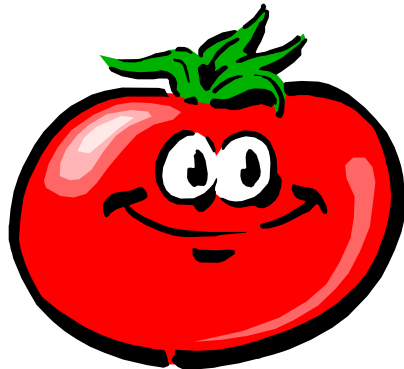
Fertilization (eggs)

- ❖ Pollen germinates to form tube that grows to ovule (egg)
- ❖ Fertilization must take place within 24 hours of pollination
- ❖ Low (< 50) or high (> 70) night temperatures slow down pollen tube growth & prevent fertilization



CAUSES OF TOMATO BLOSSOM DROP

- Temperature
 - Days over 85° F, nights over 75° F
 - Nights below 55° F
 - 104° F or higher
- Nitrogen
 - Excess or not enough
- Soil Moisture
 - Too little stresses and weakens plants



- Excess pruning
- Wind
 - Desiccation
- Light
 - Too much or too little
- Stress caused by disease and/or insects
 - Weakened plants



TEMPERATURES ON MARCH 20, 2023

Crestview

30°
Clear
H:60° L:28°

▲ Freeze Warning
National Weather Service: Freeze Warning in Okaloosa Inland.
[See More](#)

HOURLY FORECAST

Now	6:50AM	7AM	8AM	9AM	10AM
30°	Sunrise	30°	33°	38°	44°

10-DAY FORECAST

Day	Icon	Low	High
Today	Sun	28°	60°
Tue	Cloud	32°	69°
Wed	Sun	41°	79°

Niceville

32°
Clear
H:58° L:30°

▲ Freeze Warning
National Weather Service: Freeze Warning in Okaloosa Coastal.
[See More](#)

HOURLY FORECAST

Now	6:49AM	7AM	8AM	9AM	10AM
32°	Sunrise	31°	34°	39°	44°

10-DAY FORECAST

Day	Icon	Low	High
Today	Sun	30°	58°
Tue	Sun	38°	65°
Wed	Sun	47°	73°

Fort Walton Beach

33°
Clear
H:58° L:32°

▲ Freeze Warning
National Weather Service: Freeze Warning in Okaloosa Coastal.
[See More](#)

HOURLY FORECAST

Now	6:50AM	7AM	8AM	9AM	10AM
33°	Sunrise	33°	35°	39°	44°

10-DAY FORECAST

Day	Icon	Low	High
Today	Sun	32°	58°
Tue	Sun	41°	64°
Wed	Sun	50°	72°

New York

32°
Clear
H:52° L:31°

Clear conditions will continue all day.

HOURLY FORECAST

Now	6:59AM	Now	8AM	9AM	10AM
32°	Sunrise	32°	33°	35°	38°

10-DAY FORECAST

Day	Icon	Low	High
Today	Sun	31°	52°
Tue	Sun	36°	61°
Wed	Cloud	41°	58°
Thu	Cloud	49°	65°
Fri	Cloud	48°	62°





SITE SELECTION



**Trees
Compete!**

Some trees have deep roots close to the trunk, but most tree roots are concentrated in the upper foot of soil.

- Near house & water source
- Open to good air movement
- Full sun (> 5-6 hours/day)
- Away from competing tree roots
- Well-drained soils
- ***Soil pH 6.0 to 6.5**



Roots can extend up to three times the dripline of the tree.

**Consider tree
shade, too.**

***Be careful to not over-lime your garden!**

Common materials that function as a liming agent and that raise the soil pH:

- Lime
- Wood Ashes
- Mushroom Compost

Soil Test, Don't Guess!



SITE SELECTION



Poor drainage = Poor tomato production



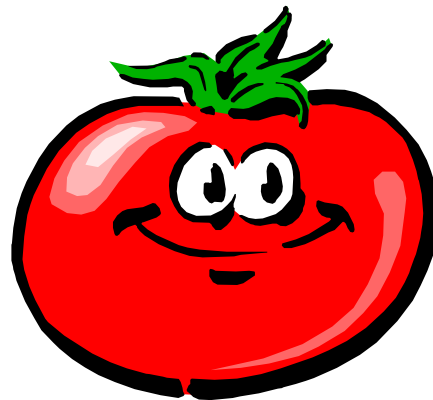
Too many trees for tomatoes
(Shade & Root Competition)



CULTIVAR SELECTION

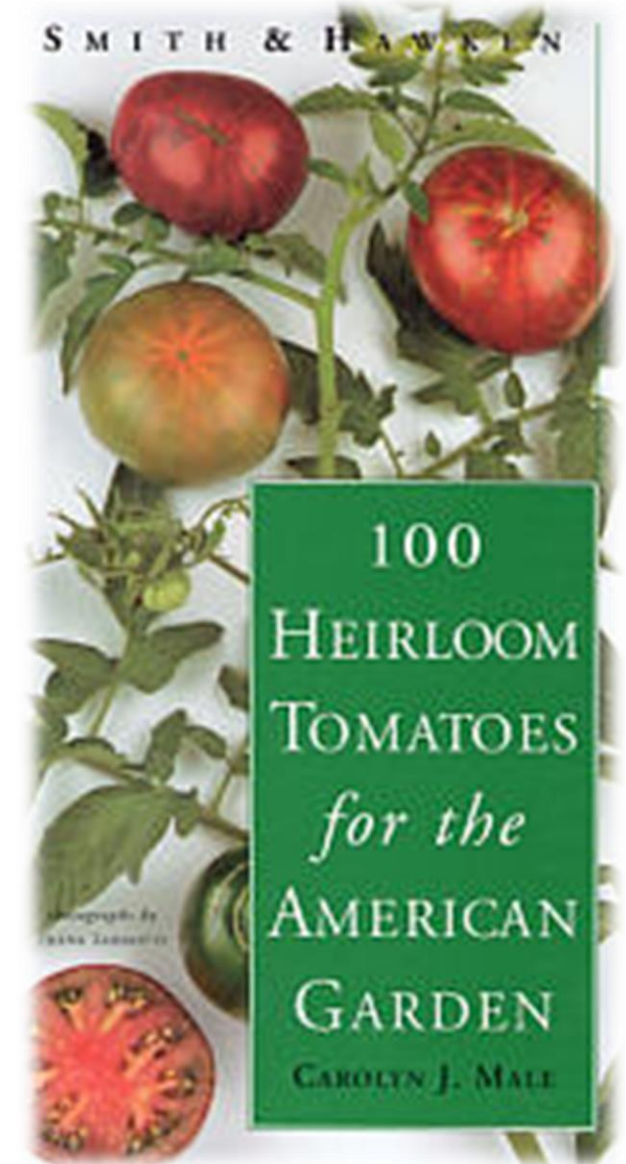
Considerations:

- Disease Resistance or Tolerance
- Personal Preference (Size, Color...)
- Hybrid vs. Heirloom
- Determinate vs. Indeterminate



HEIRLOOMS

- **Family:** seeds that have been passed down for several generations through a family
- **Commercial:** open-pollinated varieties introduced before 1940
- **Created:** crossing two known parents and dehybridizing the resulting seeds for how ever many years/generations it takes to eliminate the undesirable characteristics
- **Mystery:** varieties that are a product of natural cross-pollination of other heirloom varieties



HEIRLOOM TOMATO VARIETIES

- More lobed and undulated fruit
- Open pollinated
- More prone to diseases, fruit cracking
- 75 to 110 day (Brandywine 100day)
- Aunt Ginny, Boondocks, Prudens Purple, Striped German, Old German, Amish Paste, Mr. Stripey



www.heirloomtomatoes.bizland.com

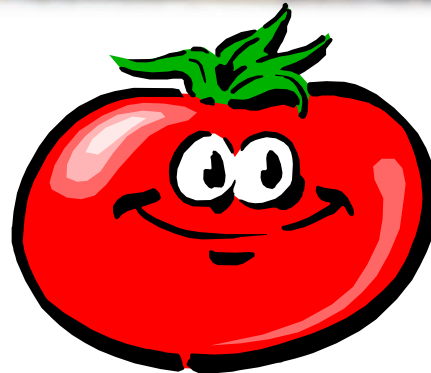
PLANT SELECTION

➤ Variety

➤ Quality

- Age (5 to 6 Weeks)
- Size (5 to 7 Inches)
- Pest Free (No Spots!)
- Color (Dark Green)
- Roots (Fibrous & White)

Avoid old, oversized plants!



CULTURAL PRACTICES

Planting



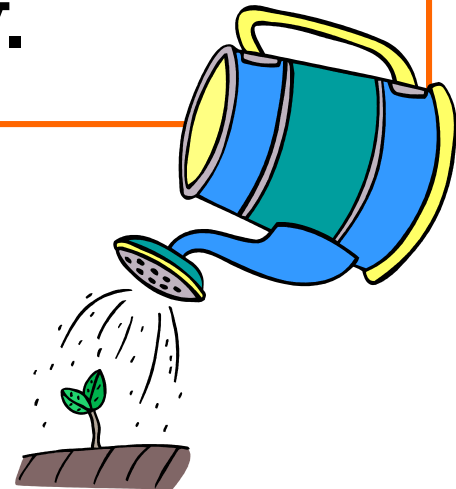
Cultural Practices

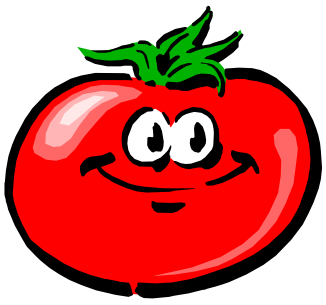
Watering the Garden



IRRIGATION CONSIDERATIONS

- Water early in day.
- Young plants need 1" water per week -- apply water frequently.
- Mature plants need 2" water per week - apply infrequently.





CULTURAL PRACTICES

MULCHING

Benefits of Mulch:

- Retains soil moisture
- Reduces weeds
- Moderates soil temperatures
- Less fruit disease (no contact with soil)





Do you see a problem here?



Cultural Practices

Fertilizing Tomatoes



FERTILIZER SIDE-DRESSING



SUFFICIENCY RANGES FOR PETIOLE SAP TESTING FOR TOMATOES

Fresh Petiole Sap Concentration In Parts Per Million

Tomato Plant Stage	Nitrate Nitrogen NO₃-N	Potassium (K)
First Buds	1,000 - 1,200	3,500 - 4,000
First Open Flowers	600 - 800	3,500 - 4,000
Fruits one inch diameter	400 - 600	3,000 - 3,500
Fruits two inch diameter	400 - 600	3,000 - 3,500
First Harvest	300 - 400	2,500 - 3,000
Second Harvest	200 - 400	2,000 – 2,500

**As plants mature and fruit, the demand for nitrogen decreases.
Excessive nitrogen can reduce fruit set and development.**





Results of Excessive Nitrogen!!!

Big, Green, Ugly Plant with Few to No Fruit

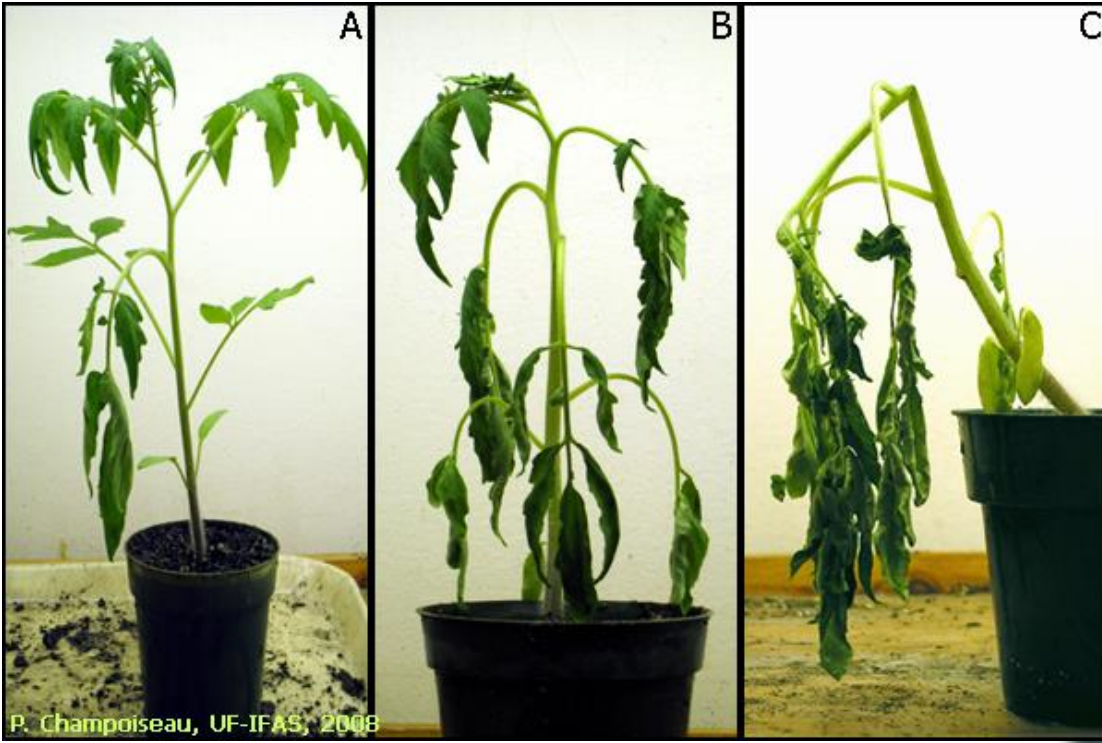


TWO COMMON DISEASES

Tomato Spotted
Wilt Virus Leaf &
Fruit Symptoms



Highly
Magnified
Thrips



Bacterial Wilt
Symptom & Sign



RESISTANT VARIETIES (ALL USE SW-5 GENE)

- Amelia
- Talladega
- Bella Rosa
- Quincy
- BHN 444
- BHN 640
- BHN 602
- Crista



TOMATO VARIETIES RESISTANT TO BACTERIAL WILT & TOMATO SPOTTED WILT VIRUS

Look for tomatoes with good resistance “package”

Tomato Spotted Wilt Virus Resistant

- BHN 602, Seigers, Seedway
- Top Gun, Seigers, Seedway
- Amelia (TSW & root knot nematode resistant)
- Crista (TSW & root knot nematode resistant)
- Quincy, Seminis dealers
- Bella Rosa - Rupp Seed Company, 1-800-700-1199
- Fletcher, also nematode resistant, Seedway
- Mountain Glory

Bacterial Wilt Resistant

- Neptune (Seeds are probably no longer available)
- Florida 7514 – One parent is Neptune. – Rupp Seed Company, 1-800-700-1199
- BHN 669 - Rupp Seed Company, 1-800-700-1199
- BHN 446 – May not be available.
- BHN 466 – May not be available.



METALIZED MULCH

Also called silver, aluminized or highly UV-reflective mulch



HOST OF TOMATO ARTHROPODS



Pest	Neem ^{d,e}	Spinosad ^{d,e}	Bt ^{a,e}	Carbaryl ^d	Malathion ^d	Pyrethroids ^{b,d}	Soap ^{c,e}	Hort. Oil ^{c,e}	Imidacloprid ^d	Acetamiprid ^d
Aphids	X				X		X	X	X	X
Armyworm		X	X			X				
Bean leafroller		X	X			X				
Cabbage looper		X	X		X	X				
Colorado potato beetle		X							X	X
Corn earworm/ fruitworm		X	X			X				
Cowpea curculio				X		X				X
Cucumber beetle	X			X	X	X				X
Diamondback moth caterpillar		X	X							
Flea beetle				X	X	X			X	X
Leafminers		X								
Leafhoppers				X					X	X
Melonworm, pickleworm		X	X		X	X				
Mexican bean beetle				X	X	X				X
Spider mites	X							X		
Squash vine borer			X			X				
Stink bugs						X				X
Thrips		X							X	X
Tomato hornworm, pinworm		X	X			X				
Whiteflies	X					X	X	X	X	X

Table taken from the Florida Vegetable Gardening Guide



ROTATE PLANT FAMILIES

Apiaceae (Parsley) Family

- Carrots
- Celery
- Cilantro
- Fennel
- Parsley
- Parsnips

Asteraceae (Aster) Family

- Endive/Escarole
- Lettuce
- Sunflower

Brassicaceae (Cole) Family

- Broccoli
- Cabbage
- Cauliflower
- Chinese Cabbage
- Collards
- Kale
- Kohlrabi
- Mustard
- Radish
- Turnips

Chenopodiaceae (Goosefoot) Family

- Beets
- Chard
- Spinach

Convolvulaceae (Morning Glory) Family

- Sweet Potato

Cucurbitaceae (Mellon) Family

- Cantaloupe
- Cucumber
- Pumpkin
- Squash
- Watermelon

Fabaceae (Pea/Bean) Family

- Peas
- Runner beans
- Bush beans
- Fava beans
- Garbanzo beans
- Peanuts

Liliaceae (Lily) Family

- Garlic
- Chives
- Leeks
- Onions

Malvaceae (Mallow) Family

- Okra

Poaceae (Grass) Family

- Barley
- Corn
- Millet
- Rice
- Rye
- Wheat

Rosaceae (Rose) Family

- Strawberry

Solanaceae (Nightshade) Family

- Eggplant
- Pepper
- Potato (Irish)
- Tomato
- Tomatillos



PEST CONTROL ARSENAL



Copper-based Fungicide

Be careful with the overuse of copper on plants!



STINK BUG & LEAF-FOOTED BUG



a. Cloudy spot caused by stink bug feeding

b. Damage beneath cuticle. Contents of cells have been removed and replaced with air



TRAP CROPS



Buckwheat



Sorghum



Millet



Sunflowers



NEMATODE MANAGEMENT



Root-Knot Nematode

- Crop rotation
- Resistant varieties (VFN)
- Organic matter
- Cover crops
- Soil solarization

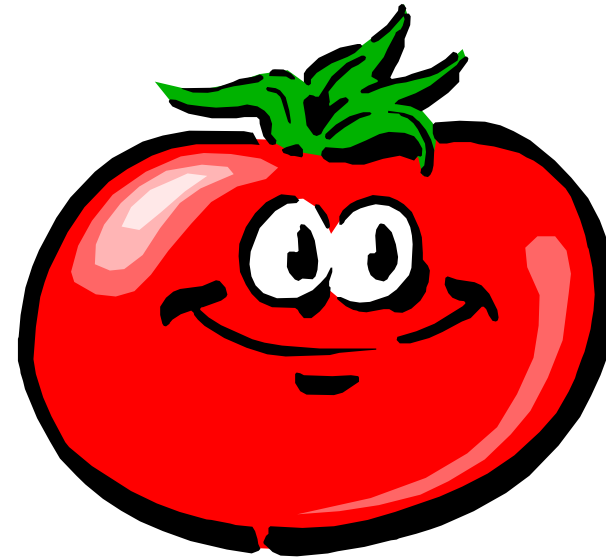


Soil Solarization



COMMON ABIOTIC DISORDERS

- Blossom Drop
- Deformed Fruit
- Blossom-End Rot
- Sunscald
- Herbicide Injury





Tomato Blossom Drop





Deformed Fruit





**Calcium Deficiency/
“Blossom-End Rot”**





Sunscald



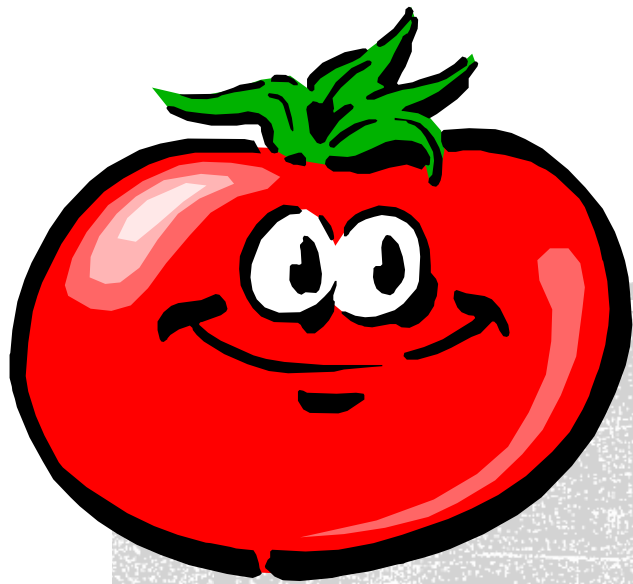
Herbicide Injury



ADDITIONAL INFORMATION AVAILABLE AT:

- **edis.ifas.ufl.edu**
- **solutionsforyourlife.ufl.edu**
- **edis.ifas.ufl.edu/topics/tomato**
- **Your local UF/IFAS Extension Office**





THANK YOU!

Larry Williams
UF/IFAS Extension Agent
Okaloosa County

