Growing Tomatoes in the Home Garden

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Expectations for tomato production in Florida

The reality or challenges of producing tomatoes in Florida

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

Family includes:

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

**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

**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 Intermode varieties with the controlled growth habit of a "determinate" with the unlimited production potential of an "indeterminate"
Plant Growth Habits

Determinate Growth Habits

Indeterminate Growth Habits
Flowers
- Individual flowers borne in clusters of 4-8 flowers
- Largely self-fertilized and primarily wind pollinated

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

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
Growing Tomatoes

- Site Selection
- Cultivar Selection
- Recommended Varieties
- Cultural practices
  - Planting
  - Irrigation
  - Mulching
  - Staking & caging
  - Fertility
  - Diseases, Insects & Abiotic Disorders

Site Selection

- 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 5.8 - 6.3

Trees Compete!

Some trees have deep roots close to the trunk, but most tree roots are concentrated in the upper foot of soil. Roots can extend up to three times the drip line of the tree.
Cultivar Selection

Considerations:
- Disease Resistance or Tolerance
- Personal Preference (size, color, ...)
- Hybrid vs. Heirloom
- Determinate vs. Indeterminate

Tomato Varieties Resistant to Bacterial Wilt & Tomato Spotted Wilt Virus

**Tomato Spotted Wilt Virus Resistant**
- BHN 662, Siggers, Seedway
- Top Gun, Siggers, 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.
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 however 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

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

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:

Mulching

Watching for Pests

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)

Staking and Pruning:

- Staking
- Trellising
- On Fence
- Cages

Note: Disinfect recycled stakes/cages.
Cultural Practices
Fertilizing Tomatoes:

<table>
<thead>
<tr>
<th>Soil Type</th>
<th>N.P.K Ratio</th>
<th>Amount banded per 10ft row</th>
<th>Amount broadcasted per 100 sq ft</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sand, marl or clay</td>
<td>6-6-6</td>
<td>5 oz</td>
<td>2-3 lbs</td>
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<td>Organic (muck or peat)</td>
<td>0-12-20</td>
<td>2 oz</td>
<td>1-2 lbs</td>
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Sufficiency Ranges for Petiole Sap Testing for Tomatoes

Fresh Petiole Sap Concentration In Parts Per Million

<table>
<thead>
<tr>
<th>Tomato Plant Stage</th>
<th>Nitrate Nitrogen NO₃-N</th>
<th>Potassium (K)</th>
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<tbody>
<tr>
<td>First Buds</td>
<td>1,000 - 1,200</td>
<td>3,500 - 4,000</td>
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<tr>
<td>First Open Flowers</td>
<td>600 - 800</td>
<td>3,500 - 4,000</td>
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<td>Fruits one inch diameter</td>
<td>400 - 600</td>
<td>3,000 - 3,500</td>
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<tr>
<td>Fruits two inch diameter</td>
<td>400 - 600</td>
<td>3,000 - 3,500</td>
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<tr>
<td>First Harvest</td>
<td>300 - 400</td>
<td>2,500 - 3,000</td>
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<td>Second Harvest</td>
<td>200 - 400</td>
<td>2,000 - 2,500</td>
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* 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

Common Diseases

- Tomato Spotted Wilt
  - Vine Leaf & Fruit Symptoms

- Bacterial Wilt
  - Symptom & Sign
Highly Magnified Thrips

Resistant Varieties (all use Sw-5 gene, seeing up to 5 – 10 %)

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

Metalized Mulch

Also called silver, aluminized, or highly UV-reflective mulch
Common Diseases

Fusarium Wilt Symptoms

Early Blight Leaf & Stem Symptoms

Bacterial Spot on Leaf & Fruit

Phoma Fruit Rot Symptom on Leaf & Fruit

Tomato Arthropods
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<tr>
<th>Pest</th>
<th>Neonicotinoid</th>
<th>Spinosad</th>
<th>Hy</th>
<th>Carbaryl</th>
<th>Multikill</th>
<th>Pyrethrin</th>
<th>Sevin</th>
<th>Benomyl</th>
<th>Mancozeb</th>
<th>Pythoxcaptan</th>
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Trap Crops

- Root-Knot Nematode

Nematodes

- Crop rotation
- Resistant varieties
- Organic matter
- Cover crops
- Soil solarization
Common Abiotic Disorders

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

Tomato Blossom Drop

Deformed Fruit
Thanks! -- Questions?

Additional Information Available at:
  - [http://edis.ifas.ufl.edu](http://edis.ifas.ufl.edu)
  - [http://solutionsforyourlife.ufl.edu](http://solutionsforyourlife.ufl.edu)
  - [http://ftsg.ifas.ufl.edu](http://ftsg.ifas.ufl.edu)
  - Your local UF/IFAS Extension Office

Credits
  - Dan Mullins, UF/IFAS Extension Agent, Santa Rosa County
  - Larry Williams, UF/IFAS Extension Agent, Okaloosa County
  - Gerald Edmondson, UF/IFAS Extension Director, Okaloosa County
  - Dr. Steve Olson, UF/IFAS Extension Vegetable Crops Specialist
  - Linette Jenkins, Office Supervisor, Okaloosa County Extension
  - Kevin Schoessow, University of Wisconsin Extension Agent, Burnett, Sawyer & Washburn Counties

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