Uh Oh, What’s Wrong With My Plants?

Dr. Richard G. Snyder
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Temperature Control

- Heaters (64°F min)
- Fans (keep it under 90°F)
- Vents
- HAF
- Shade Materials?
- Pad & Fan system?
- Fogging?

Avoid Overcrowding

- Plant Population
- 5 square feet per plant
- Length X width / 5 = number of plants
- 24 X 96 ➞ 460 plants
- 3 or 4 plants for 2 cubic foot lay-flat bag
- 2 plants per 5 or 7½ gallon upright bag or 5 gallon nursery bucket

Good Quality Water

- Get your water tested
  - In Mississippi – Mississippi State Chemical Laboratory
  - 1 Gallon in CLEAN jug (not from milk!)
  - i.e. from bottled water
- Not all water is created equal
- Water quality can change over time
- Especially community water

Tissue Analysis

How to Take Sample

- Snap off 10 to 12 leaves total
- Not more than 1 per plant
- Randomly selected from throughout greenhouse
- Choose leaf just above golf ball sized fruit
- Send to laboratory for analysis
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Tissue Analysis Report

What could possibly go wrong?

**Tomato Troubles ....**

Be prepared for Insects and Diseases

- They will get into your greenhouse.
- Insects do not know if you are organic.
- Prevention works best.
- Greenhouse structure does not prevent insects and diseases from getting in.
- Consider a double door entry.
- Consult with your Pest Management Specialists.

Whiteflies

Leaf miners

Botrytis – Gray Mold
Tomato Spotted Wilt Virus

- Numerous dark spots
- Begins on younger leaves
- Leaves droop (wilt)
- Fruit with ring spots
- Plants eventually die

Target Spot / Early Blight

- Leaf lesions appear like a target (bull’s eye).
- Starts on lower leaves.

Disease Management in the Greenhouse Environment

- Environment is hot and humid.
- Moist leaf surfaces promote disease development.
- Maximize ventilation!
- Cooling and drying will avoid disease and cure it faster.
- Remove lower leaves to improve air movement.
- Use HAF fans.

Blossom-End Rot

- Blossom-end brown to black, dry, sunken, leathery
- Lack of calcium in the fruit
- Keep calcium level up in fertilizer (150 to 200 ppm)
- If water source is high in Ca, use less from fertilizer.
- Nitrogen
  - Do not overfertilize with nitrogen.
  - Do not use too much ammonium.
  - Avoid uneven water (dry periods)
  - Don't let plants wilt.
  - Need young, actively growing roots for calcium uptake.

What is it?
No Calcium

- Tomatoes require calcium
- Blossom-end rot
- Death of the terminals
  - Weak, brown,
  - then black
- End of crop

Fruit Cracking/Splitting

- Radial cracking
- Concentric cracking
- Avoid sharp changes in water.
- Avoid wilting.
- Splitting is only skin deep.

Catfacing

- Irregular, malformed fruit, especially on the bottom; crevices, scars, etc.
- Caused mainly by cool temperature (early fruit especially); can be caused by very high temperature, too.
- Some varieties more susceptible
- Fruit still tastes fine.

Leaf Roll

- Often starts at the bottom and moves up.
- This is not a disease; it is physiological.
- Usually occurs with wet soils, high fertility.
- Looks bad, but does not reduce yield or fruit quality.
**What is it?**

**Blossom Drop**
- Flowers fall off --> reduces yield
- Temperature too high or too low
  - Day temp above 90˚ or night temp above 75˚F interferes with fruit set.
  - Night temp above 64˚F is ideal in greenhouse.
- High humidity
- Too much or too little nitrogen
- Any stress can cause flower drop.

**Why So Small?**

**Small Tomatoes**
- Fertility?
- Water?
- Poor Pollination?
  - Slice fruit transversely.
  - Check for seed numbers.
  - Other symptoms: angular, flat-sided fruit.

**What is it?**

**Leaf Yellowing – Interveneal**
- Upper Leaves
  - Iron deficiency – starts at base of leaflets
  - Manganese deficiency – starts at tips of leaflets
- Lower Leaves (or mid range)
  - Magnesium deficiency is most common culprit, especially at or after 4th cluster set.
Leaf Yellowing – Not Interverinal

- Nitrogen deficiency – general yellowing
- Senescence – bottom leaves turn yellow
  - Natural death, promoted by aging and shade
- Disease
  - Most often Early Blight / Target Spot
    - First, small brown circles on lower leaves
    - Then, larger brown circles
    - Then, yellow leaves
    - Leaf drop
    - Finally, it progresses up the plant

Uneven Ripening

- Green stripes, streaks, blotches, stars, shoulders, etc.
- May be caused by high fertility (N), low potassium, high temperature (lycopene killed), viruses, white flies.
- Maintain correct fertilizer.

What is it?

Russetting

- Many, very fine cracks on fruit surface
- Causes water loss; poor shelf life
- Believed to be due to
  - Moisture on fruit surface
  - Topping plant along with all suckers
- Use HAF fans.
- Leave 2 leaves above highest cluster at topping.

Sun Scald

- White blistered area on fruit
- Can turn leathery, can be invaded
- From fruit exposed to the sun
- Keep good leaf cover.
- Do not prune too heavily.
- When topping, leave 2 leaves at top.

Wilting – several possible causes

Abiotic (physical damage) | Biotic (disease)
Carbon Monoxide / Ethylene

Cold Damage--Oedema

Spray Injury / Burn

What is it?

A Few Subtle Suggestions...

Use Diagnostics Resources When Needed.

- Local County Agent or Area Horticulture Agent
- Extension Vegetable Specialist
- Digital diagnostics
- Diagnostics laboratory
- Email list
- Friends in the business

A good way to preserve pests

One possible wiring technique
Publication Resources

- Greenhouse Tomato Handbook
  (Guía del cultivo del tomate en invernaderos)
- Tomato Troubles: Common Problems with Tomatoes
- Greenhouse Tomato Growers’ Glossary
- Environmental Control for Greenhouse Tomatoes
- Greenhouse Tomatoes - Pest Management in Mississippi
- Budget For Greenhouse Tomatoes

All are on the web site

Internet Resources

- Greenhouse Tomato FAQ
  http://extension.msstate.edu/crops/commercial-horticulture/greenhouse-tomatoes
- Greenhouse Tomato Short Course
  www.greenhousetomatosc.com
- Facebook
  www.facebook.com/GreenhouseTomatoShortCourse

Greenhouse Tomato Survival Kit

10 DVD Set

http://greenhousetomatosc.com (DVD tab)

Greenhouse Tomato Short Course

www.greenhousetomatosc.com

- Raymond, Mississippi
- March 6 & 7, 2018
- Expert Speakers
- Educational Materials

- Growers from 20+ states
- Meals Included
- Exhibitors

Worry!

- Check your work.
- Use pH and EC meter to check nutrient solution daily and after mixing.
- Use a gallon jug to check volume per day.
- Walk the greenhouse every day.
  - Look for wilting plants.
  - Look for critters.

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Questions?

Thanks for coming!

Just 1 more ...

What is it?