

# Tomato Problems, Diseases and Pests

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## Additional Resources

- NC Cooperative Extension  
mountainhort.ces.ncsu.edu / tomato / Pubs & Factsheets
- Purdue Extension  
Purdue Tomato Doctor smartphone & tablet app

## General Categories of Tomato Problems and Diseases

### **Abiotic**

Moisture  
Nutrition (over, under)  
Weather  
Location  
Injury  
Toxins

### **Biotic**

Viruses  
Bacteria  
Fungi  
Nematodes  
Insects  
Mites  
Parasites

## Integrated Pest Management

Always diagnose the problem, disease or pest first

In ascending order, use cultural and mechanical/physical interventions first, followed by biological alternatives and use chemical treatments as the last resort

## Cultural Tips (managing abiotic factors)

- Establish a good balance of top growth and root growth in all stages of tomato development
- Water needs: 1 to 1 ½ inches per week
- Do not over fertilize (best to obtain soil test and/or follow the fertilization guidelines listed below)
  - Use transplant / starter solution & lime soil at planting (½ to 1 cup starter solution & ¾ cup lime)
  - Fertilize 1 to 2 weeks after fruit set (2-3 tablespoons complete fertilizer [8-8-8 or 10-10-10] per plant), although fertilizers with 1:2:2 or 1:3:3 N:P:K ratios perform best
  - Fertilize again 2 weeks after first picking
  - Again one month later (six weeks after picking first ripe fruit)
- Physiologic leaf curl
  - Leaves curl along their long axis because of poor water transport into the leaves
  - Top vs. root development is the problem, especially during spring to summer shift
  - Temporary condition
- Flowers but no fruit
  - 55°** Air temperature must be  $\geq 55^\circ$  for 50 continuous hours for fruit to set
  - 75°** Air temp  $\geq 75^\circ$  at night reduces fruit set
  - 95°** Air temp  $\geq 95^\circ$  during day reduces fruit set
  - Too much nitrogen reduces fruit set (do not over fertilize)

- Other abiotic problems

Hail damage

Sunscald

Cracking (excessive water, over fertilization, temperature fluctuations, sun exposure)

Blossom-end rot (physiological disorder caused by lack of sufficient calcium in fruit; calcium carried in the plant by water so exacerbated by extremes in soil moisture and/or imbalance between top and root growth). Best prevented by maintaining proper soil pH (6.5-6.7), mulching and proper fertilization.

Walnut wilt (toxin juglone found in walnut leaves, fruit hulls, inner bark and roots; tomatoes are very sensitive to the toxin)

Herbicide injury (2,4-D; glyphosphate)

Frost injury (know your average first frost dates, which vary considerably in WNC)

## **Biotic Tomato Diseases**

### **Vascular Wilt Diseases**

**Verticillium wilt** (*V. alboatum* & *V. dahlia*)

**Fusarium wilt** (*F. oxysporum*)

**Bacterial wilt** (*Ralstonia solanacearum*)

Management: resistant varieties, crop rotation, sanitation, avoid poor drainage, solarize soil, soil fumigation, soil drench, mustard cover crop, NO chemical control available

### **Tomato Leaf Spot Diseases**

**Bacterial spot** (*Xanthomonas* spp.) – likes hotter temps (>80-85°F)

**Bacterial speck** (*Pseudomonas syringae*) – likes cooler temps (<80°F)

High humidity, rain or dew promotes the diseases & their spread; splash dispersed & mechanical movement

Management: crop rotation, sanitation, disinfect seeds, avoid handling plants when wet, remove plant debris, control solanaceous weeds, preventive sprays (copper + mancozeb)

Copper = “protectant” fungicide / bactericide; must be applied every 3 to 10 days when disease threatens

Copper diacetate (8% copper)

Copper sulfate (3.9% copper)

Copper soap (1.8% copper)

Bordeaux mixture (copper sulfate + hydrated lime)

For organic growers, consult the Organic Materials Review Institute (OMRI) pesticide list for approved products

**Early blight** (*Alternaria linariae*)

Soilborne disease agent that can carry over in plant debris; not well spread airborne

Management: resistant hybrids, crop rotation, mulch, remove volunteers, prune bottom leaves, control solanaceous weeds, increase air flow around plants

Chemical control: chlorothalonil, mancozeb, copper or neem oil of limited efficacy

**Late blight** (*Phytophthora infestans*)

Airborne (travels 10+ miles); does not overwinter but spreads north from milder climates each year

Promoted by excessive water (rain, heavy dew) & cool, cloudy weather

Management: plant resistant hybrid varieties

**Southern blight** (southern wilt, southern stem rot, southern root rot)

Caused by soil-born fungus *Athelia (Schlerotium) rolfsii*; organism can survive & over winter in plant debris and soil for several years but is usually confined to the upper 2 to 3 inches of soil

Management: rotate crops, avoid fields with history of the disease, deep plowing, pentachloronitrobenzene (PCNB)

**Root-knot nematodes**

Management: crop rotation, fallowing, solarization, suppressor crops (marigold), resistant hybrid varieties

**Tomato spotted wilt virus**

Spread by western flower thrip; no treatment available

**Hornworms**

Tobacco hornworm (sphinx moth) & tomato hornworm (five-spotted hawk moth)

**Spider mites**

May see "flares" with use insecticides

Management: hard water stream, neem oil, trap crops (bush beans as 'banker plants'), predatory mites (*Phytoseiulus persimilis*) – can consume up to seven adult spider mites or several dozen eggs per day

Often difficult to manage because they reside on underneath surface of leaves

**Stinkbugs** (brown stink bug; *Euschistus servus*)

**Tomato fruit worm** (corn earworm; *Helicoverpa zea*)