Module 11:
Plant Disease – The Disease Triangle and Management

LSU AgCenter Home Gardening Certificate Course

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If you fail to plan, you are planning to fail.  

Benjamin Franklin

Failing to prepare is preparing to fail.  

John Wooden, UCLA Basketball Coach
A garden requires patient labor and attention. Plants do not grow merely to satisfy ambitions or to fulfill good intentions. They thrive because someone expended effort on them.

— Liberty Hyde Bailey (American horticulturist and botanist who was cofounder of the American Society for Horticultural Science)
Plant Disease Triangle

Susceptible Host

Virulent Pathogen

Conducive Environment

DISEASE
Breaking the Environmental Link

Air Temperature?

• Planting time (Plant crops in season)

• Planting location (Next to a building, Sun - how much and when)
Breaking the Environmental Link

Soil Temperature?

- Planting time (Warm spring, Hot summer, Mild fall, Cool winter)
- Planting location (Sun – how much and when, Roots shady or sunny)
- Mulch (How much and what kind (color))
Breaking the Environmental Link

Rainfall?

- Planting location (Any shielding or overhangs)
- Moveable containers
Breaking the Environmental Link

Relative Humidity?

• Planting density (Microclimates)
• Planting location (Airflow barriers)
• Irrigation (Time of day)
Breaking the Environmental Link

Soil Moisture?

- Irrigation (Amount, Frequency, Time of day)
- Mulch (Depth, Type)
- Organic matter
Breaking the Environmental Link

Soil Moisture?

- Gardening method (in-ground, raised beds, containers)

- Drainage
Soil Type?

• Soil Amendments (Sand, Organic Matter, Clay)

• Use of potting mix or topsoil
Soil pH?

- Lime
- Sulfur
Breaking the Environmental Link

Soil Fertility & Health?

• Organic matter (Compost, Manures)

• Fertilizer (Organic, Chemical)

• pH (Nutrient availability)

• Soil Aeration
Plant Disease Triangle

- Susceptible Host
- Virulent Pathogen
- Conducive Environment

Disease triangle diagram illustrating the interaction between host, pathogen, and environment.
Breaking the Pathogen Link

- B
- Ca
- Cu
- Cl
- Fe
- K
- Mg
- Mo
- Mn
- N
- P
- S
- Zn
Breaking the Pathogen Link

Air Pollution

Sun & Heat

Cold

Herbicide
Breaking the Pathogen Link

Virulent Pathogen: Fungi, fungal-like organisms, bacteria, phytoplasmas, viruses, viroids, nematodes and parasitic higher plants are all plant pathogens.

• Remove plant debris (keep it clean under and around your plants)

• Remove diseased plant parts and diseased plants
Breaking the Pathogen Link

- Control Insects (possible vectors)
- Control Weeds (harbor disease and insects, vectors)
Breaking the Pathogen Link

• Crop rotation

• Soil solarization

• Mulch - to prevent splattering (Plastic, Straw)
Breaking the Pathogen Link

• Irrigation – type, timing (fungal spores need water for 2 hours) What part of the plant needs water?

• Sanitation – Tools, Clothing, Shoes
Plant Disease Triangle

Susceptible Host

Conducive Environment

Virulent Pathogen

DISEASE
What Does A Healthy Plant Look Like!!
Breaking the Host Link

• Crop Rotation – Rotate crop families at least every other season

• Fallow Ground – Allow the ground to remain fallow for a season
Breaking the Host Link

- Grow Resistant Cultivars
- Use Disease-Free Seed
- Use Grafted Plants – Tomatoes, Eggplants, Peppers, Squash, Cucumbers, Melons
Please post all your questions and results to the message board that was emailed to you.

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