

Vegetable Garden Diseases

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Why Disease Management Matters?

- Florida's warm temperatures and humidity favor plant diseases
- Rainfall and overhead irrigation increase disease pressure
- Many diseases spread rapidly in home gardens
- Early identification improves success



Three Main Types of Plant Disease

Fungal

Bacterial

Viral

Fungal Diseases

- Most common plant disease in Florida
- ~85% of diseases are fungal
- Spread by spores in water, wind, or soil
- Examples
 - Early blight
 - Powdery mildew
 - Southern blight



Anthracnose lesions on watermelon leaves appear roughly circular to angular. Credit: U-Scout/M. Paret, UF/IFAS

Bacterial Disease

- Spread by splashing water, tools, insects
- Often favored by warm, wet conditions
- Examples:
 - Bacterial spot
 - Bacterial wilt



Advanced symptoms of bacterial leaf spot on iceberg lettuce in material collected near Belle Glade, FL. Credit: Gustavo Kreutz, UF/IFAS

Viral Disease

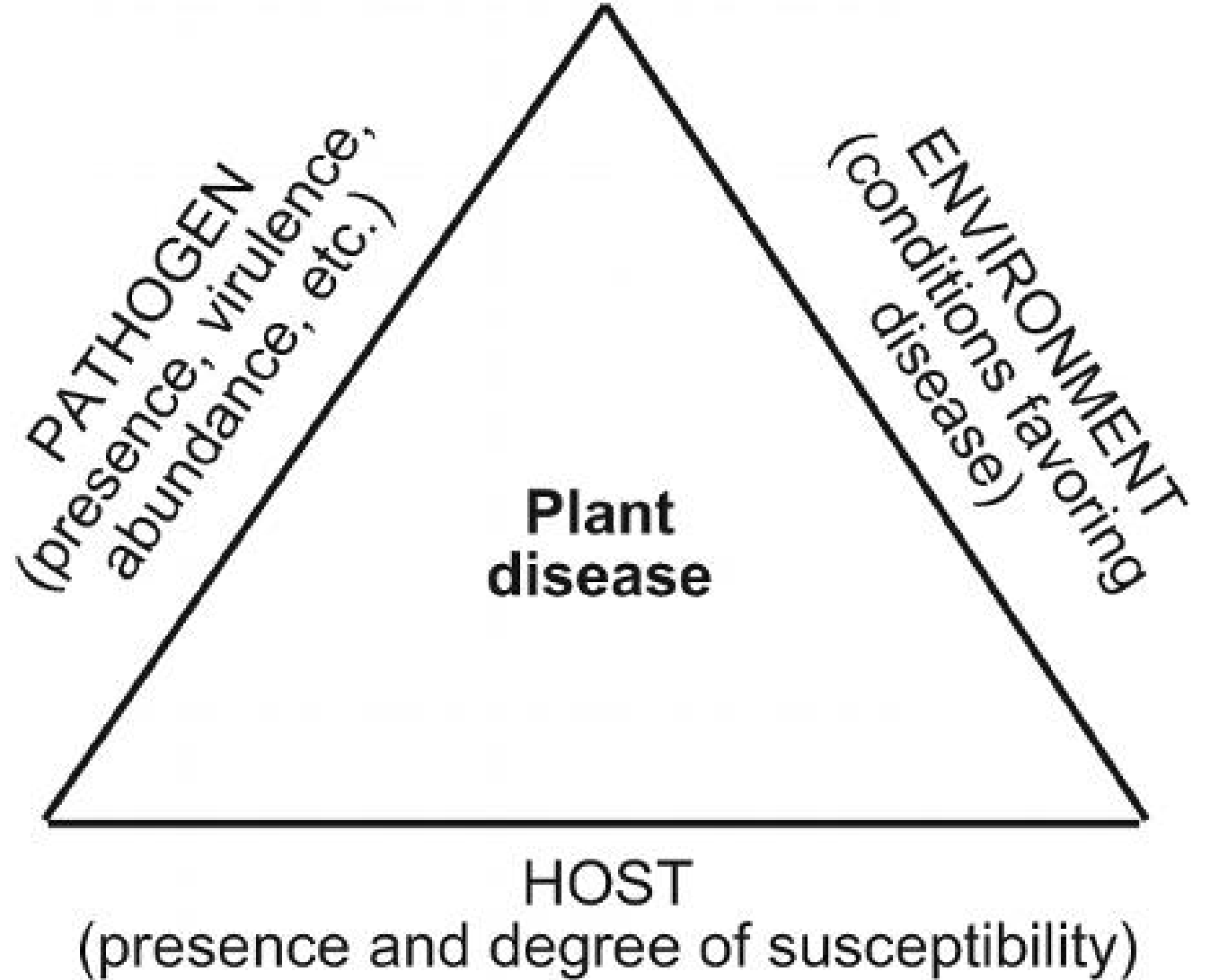
- Spread primarily by insects
- Cannot be cured once infected
- Examples
 - Tomato spotted wilt virus
 - Mosaic viruses



Photo: L.S. Osborne, UF/IFAS-MREC

The Disease Triangle

- Three conditions needed for disease
- **Susceptible Host**
 - Plant capable of being infected
- **Pathogen Present**
 - Fungus, bacterium, or virus
- **Favorable Environment**
 - Moisture, humidity, warm temperatures, poor airflow



Credit: UC IPM

Integrated Pest Management (IPM)

Correct plant selection

Crop rotation

Resistant varieties

Sanitation

Monitoring/scouting

Proper irrigation

Mulching

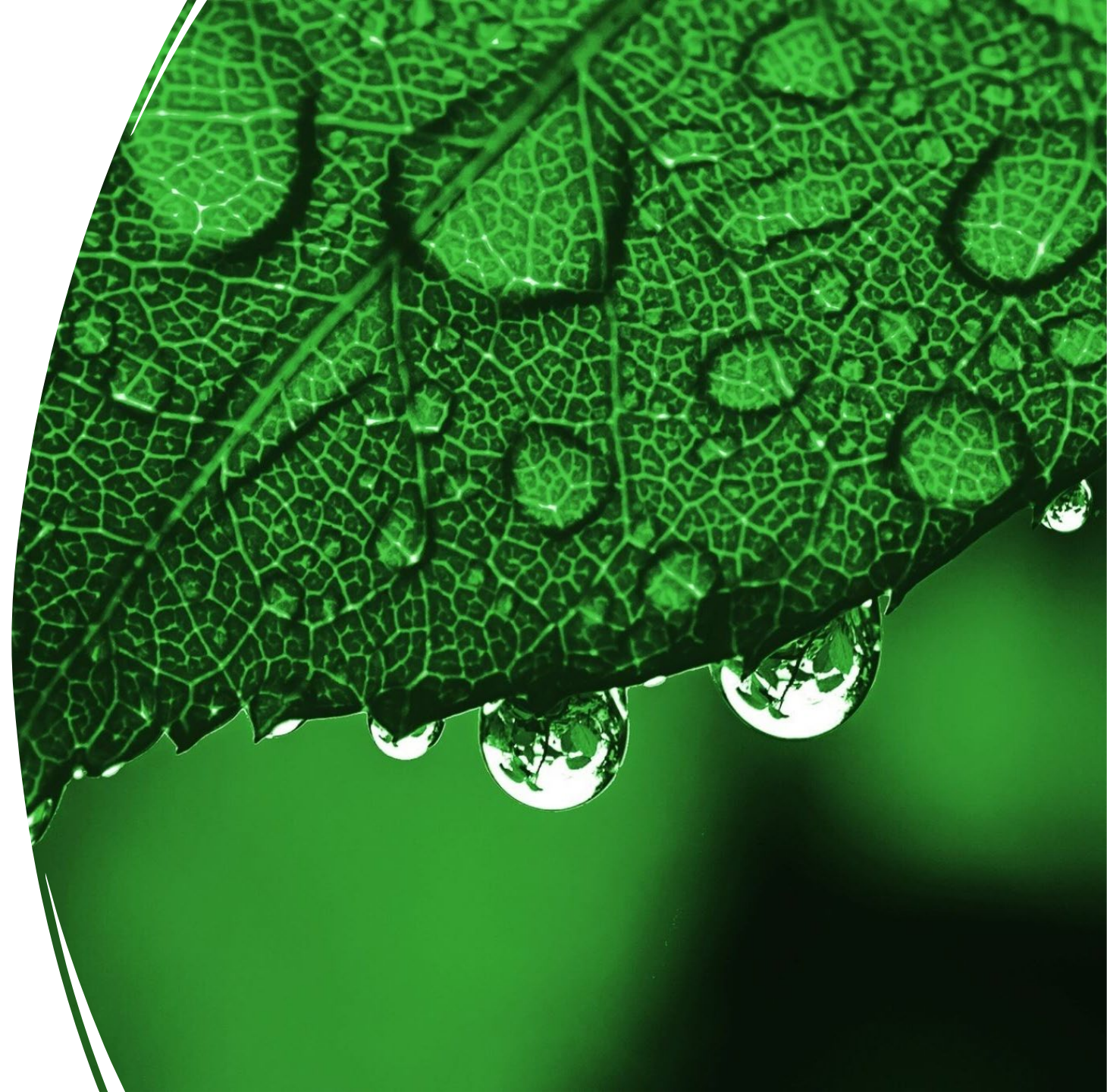
Spacing for airflow

Biological and chemical controls when needed

Prevention is KEY!

Favorable Conditions in Central Florida

- High humidity
- Frequent rain
- Warm temperatures
- Long growing seasons
- Dense plantings
- Wet foliage



Common Sources of Disease

- Infected transplants
- Contaminated soil
- Plant debris
- Tools and hands
- Insect vectors



Common Fungal Diseases

Early Blight (Fungal)

- **Affects:** Tomato, potato, celery
- **Symptoms**
 - Brown leaf spots with concentric rings (“target spots”)
 - Yellowing leaves
 - Defoliation beginning on lower leaves
- **Favorable Conditions**
 - Warm temperatures
 - Frequent moisture



Early Blight

IPM

- **Prevention**
 - Rotate crops
 - Mulch soil
 - Avoid overhead irrigation
 - Space plants properly
 - Remove infected leaves
- **Management**
 - Sanitize tools
 - Remove plant debris
 - Use resistant varieties
 - Apply labeled fungicides when necessary
- **IPM Focus**
 - Reduce leaf wetness duration



Powdery Mildew (Fungal)

- **Affects:** Cucurbits
- **Symptoms**
 - White powdery growth on leaves
 - Yellowing foliage
 - Reduced vigor
- **Favorable Conditions**
 - High humidity
 - Moderate temperatures
 - Poor airflow



Powdery Mildew IPM

- **Prevention**
 - Increase airflow
 - Avoid overcrowding
 - Use resistant varieties
 - Scout regularly
- **Management**
 - Remove infected leaves
 - Avoid excessive nitrogen
 - Apply fungicides early if needed
- **Important Note**
 - Unlike many fungi, powdery mildew can thrive without free water on leaves.



Southern Blight (Fungal)

- **Affects:** Tomato, pepper, beans, lettuce, and many other vegetables
- **Symptoms**
 - Sudden wilting
 - White fungal growth at soil line
 - Small tan “mustard seed” structures (sclerotia)
- **Favorable Conditions**
 - Hot temperatures
 - Wet soils



Southern Blight IPM

- **Prevention**
 - Rotate crops
 - Remove infected plants immediately
 - Avoid moving contaminated soil
 - Improve drainage
- **Management**
 - Solarize soil
 - Mulch carefully
 - Sanitize tools
 - Destroy infected plant debris
- **IPM Focus**
 - Soil sanitation and prevention are critical.



Damping Off (Fungal)

- **Affects:** Seedlings of many vegetables
- **Symptoms**
 - Seedlings collapse at soil line
 - Poor germination
 - Water-soaked stems
- **Causes**
 - Pythium
 - Rhizoctonia
 - Other soil fungi



Damping Off IPM

- **Prevention**
 - Use clean containers
 - Sterile potting media
 - Avoid overwatering
 - Provide airflow
- **Management**
 - Remove infected seedlings
 - Improve drainage
 - Start with disease-free seed



Fusarium Wilt (Fungal)

- **Affects:** Tomato, watermelon, and other vegetables
- **Symptoms**
 - Yellowing on one side
 - Wilting despite moist soil
 - Brown vascular tissue
- **Disease Type**
 - Soilborne fungal pathogen



Vascular discoloration in crown is diagnostic for Fusarium wilt on watermelon. Credit: N. Dufault, UF/IFAS

Fusarium Wilt IPM

- **Prevention**
 - Resistant varieties (“F” resistance)
 - Crop rotation
 - Healthy soil management
- **Management**
 - Remove infected plants
 - Avoid spreading contaminated soil
 - Solarization may help
- **Note:** Fusarium survives in soil for years



Transplanted seedling in the greenhouse exhibiting wilting and yellowing due to infection with the Fusarium wilt fungus
Credit: N. Dufault, UF/IFAS

Common Bacterial Diseases

Bacterial Spot (Bacterial)

- **Affects:** Tomato and pepper
- **Symptoms**
 - Small dark leaf lesions
 - Fruit spots
 - Defoliation
- **Favorable Conditions**
 - Warm temperatures
 - Rain splash
 - Overhead irrigation



Bacterial Spot

IPM

- **Prevention**
 - Disease-free seed/transplants
 - Avoid handling wet plants
 - Reduce overhead watering
- **Management**
 - Remove infected leaves
 - Sanitize tools
 - Copper-based bactericides may help
- **IPM Focus**
 - Limit water splash



Bacterial Wilt (Bacterial)

- **Affects:** Tomato, pepper, and eggplant
- **Symptoms**
 - Rapid wilting
 - Green leaves may remain attached
 - Brown vascular discoloration
- **Spread**
 - Soilborne bacterium
 - Contaminated water/soil



Bacterial Wilt

IPM

- **Prevention**
 - Crop rotation
 - Good drainage
 - Resistant rootstocks if available
- **Management**
 - Remove infected plants immediately
 - Sanitize tools
 - Avoid moving contaminated soil
- **Note:** No cure once infected



Common Viral Diseases

Tomato Spotted Wilt Virus (Viral)

- **Affects:** Tomato, pepper, and many ornamentals
- **Symptoms**
 - Bronzing leaves
 - Ringspots
 - Stunting
 - Distorted fruit
- **Spread**
 - Thrips insects



Tomato Spotted Wilt Virus IPM

- **Prevention**

- Control thrips
- Remove weeds
- Reflective mulch can help

- **Management**

- Remove infected plants
- Monitor insect populations
- Use resistant varieties when possible

- **Note:** Viruses cannot be cured



Mosaic Viruses (Viral)

- **Affects:** Tomato, pepper, cucurbits, and beans
- **Symptoms**
 - Mottled light/dark leaves
 - Distortion
 - Stunting
 - Reduced production
- **Spread**
 - Insects
 - Human handling
 - Contaminated tools



Mosaic Viruses IPM

- **Prevention**

- Wash hands/tools
- Control insect vectors
- Remove weeds
- Use resistant varieties

- **Management**

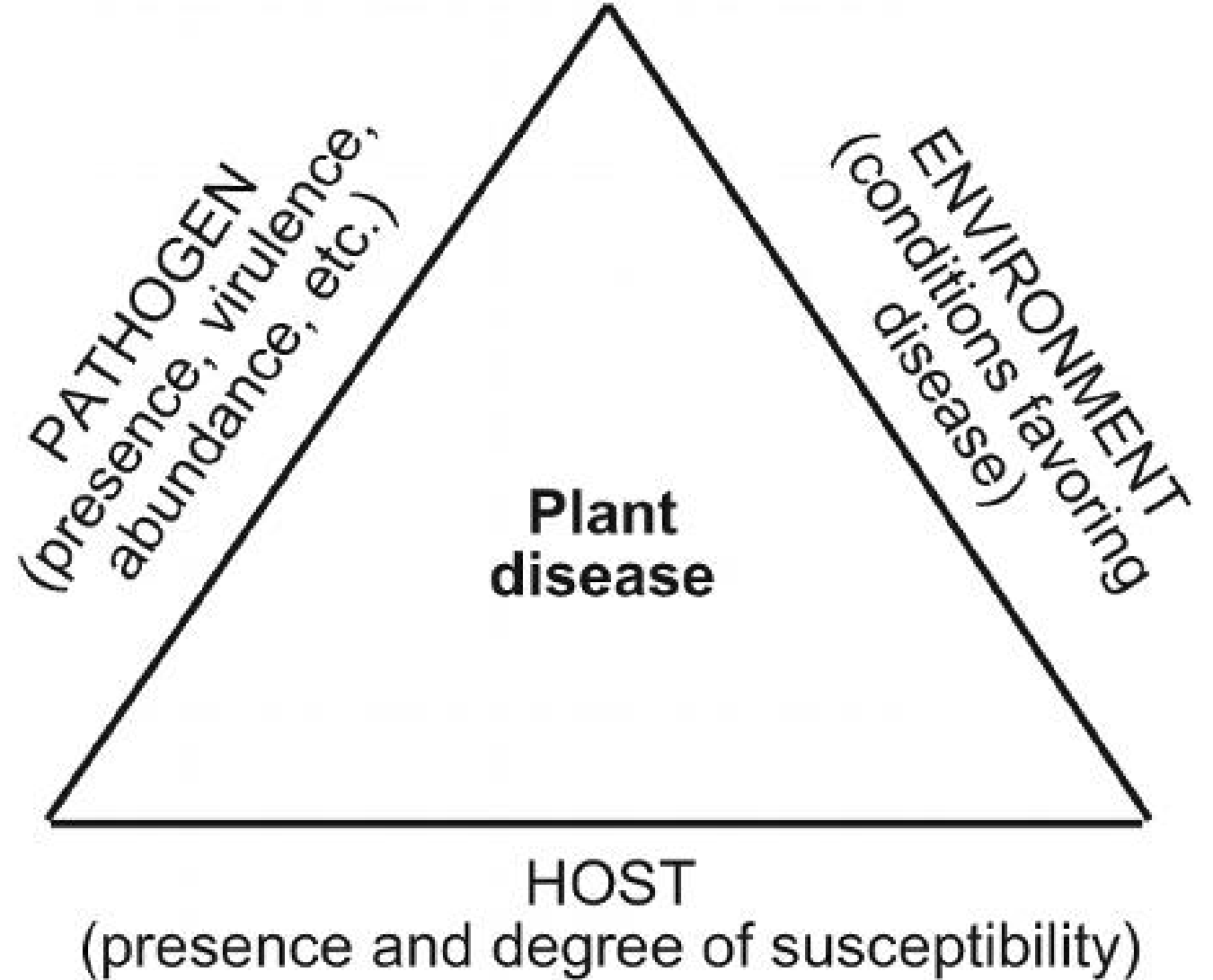
- Remove infected plants immediately
- Avoid tobacco contamination near tomatoes/peppers



General Disease Prevention Strategies

The Disease Triangle

- Three conditions needed for disease
- **Susceptible Host**
 - Plant capable of being infected
- **Pathogen Present**
 - Fungus, bacterium, or virus
- **Favorable Environment**
 - Moisture, humidity, warm temperatures, poor airflow



Credit: UC IPM


Best Practices

- Start with healthy plants
- Rotate crops
- Improve airflow
- Mulch soil
- Water at soil level
- Scout frequently
- Sanitize tools
- Remove diseased debris






Diagnosing Plant Diseases

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- **Before Treating, Ask:**
 - What crop is affected?
 - What part of the plant shows symptoms?
 - What are the weather conditions?
 - Is the issue spreading?



Recommended UF/IFAS Resources

- UF/IFAS Gardening Solutions
 - EDIS Publications
 - Local UF/IFAS Extension Office
 - UF/IFAS Plant Pathology Department
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Questions? Thank you!

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