IDENTIFYING AND CONTROLLING TOMATO, EGGPLANT & PEPPER DISEASES

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Florida, a vegetable powerhouse!

Crop	Planted Acres	Value ($1000)	US Rank (acreage)
Tomato	32,400	622,251	2nd
Watermelon	26,700	140,392	1st
Bell Pepper	19,000	267,411	2nd
Squash	8,600	52,788	1st
Cucumber	15,700	94,443	1st

Diseases caused by:

- Bacteria
- Fungi
- Oomycetes
- Viruses

Common pathogenic genera of the Solanaceae

Bacterial	Fungal*	Viral
Clavibacter	*Alternaria*	*Cucumber mosaic virus*
Erwinia	*Botrytis*	*Potato virus X*
Pseudomonas	*Cercospora*	*Potato virus Y*
Ralstonia	*Colletotrichum*	*Tobacco etch virus*
Xanthomonas	*Corynespora*	*Tobacco/Tomato mosaic virus*
	Fusarium	*Tomato chlorosis virus*
	Leveillula	*Tomato yellow leaf curl virus*
	Phomopsis	*Tomato spotted wilt virus*
	Phytophthora	
	Pythium	
	Rhizoctonia	
	Sclerotinia	
	Sclerotium	
	Stemphyllium	
	Verticillium	

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	Pythium	
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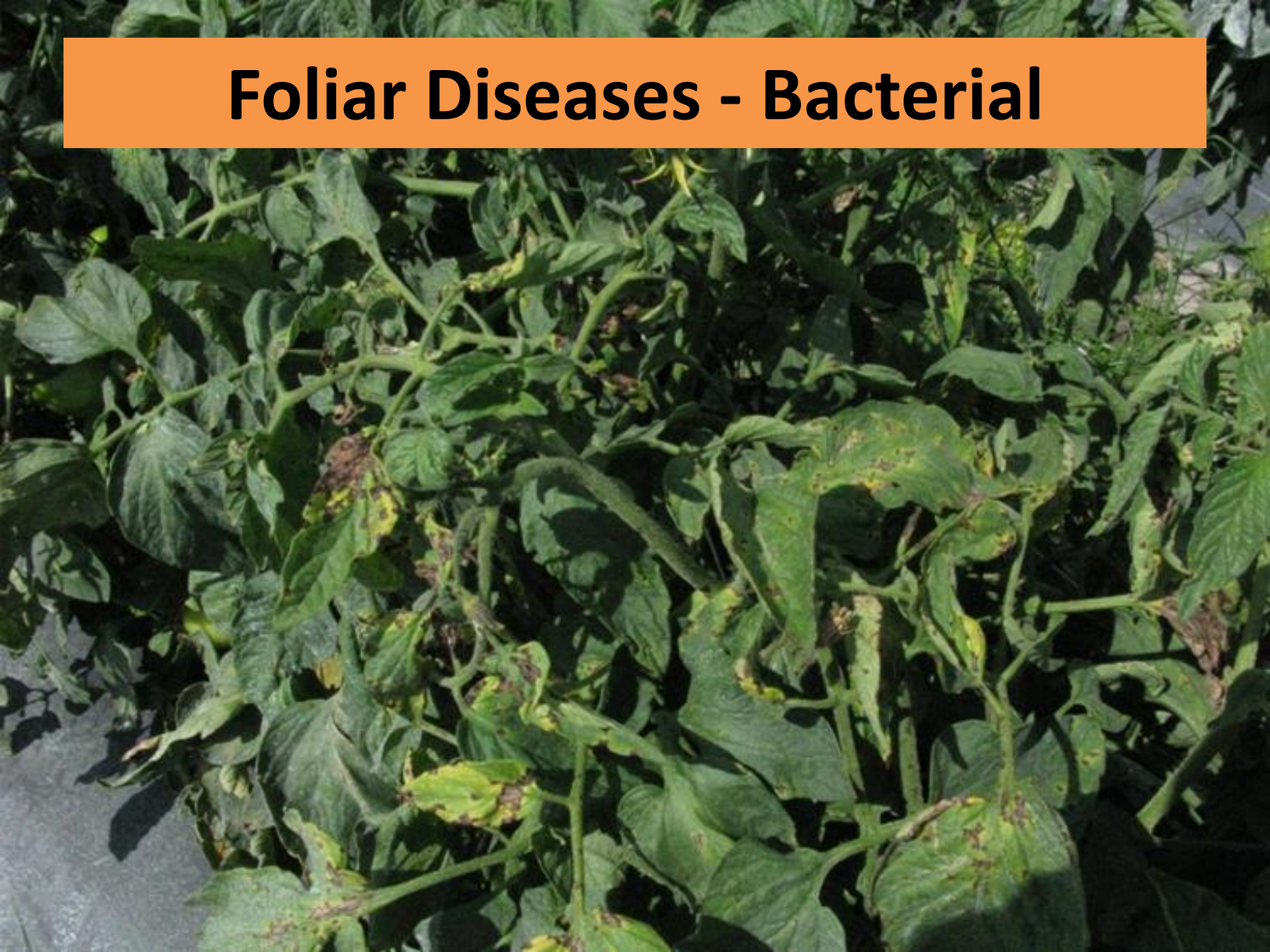
	Sclerotium	
	Stemphyllium	
	Verticillium	

Foliar Diseases - Bacterial



Bacterial Spot – affects Tomato and Pepper
(*Xanthomonas perforans, X. vesicatoria, and X. euvesicatoria*)

High disease pressure can defoliate plants prematurely and lead to fruit problems...sunscalding & secondary pathogens

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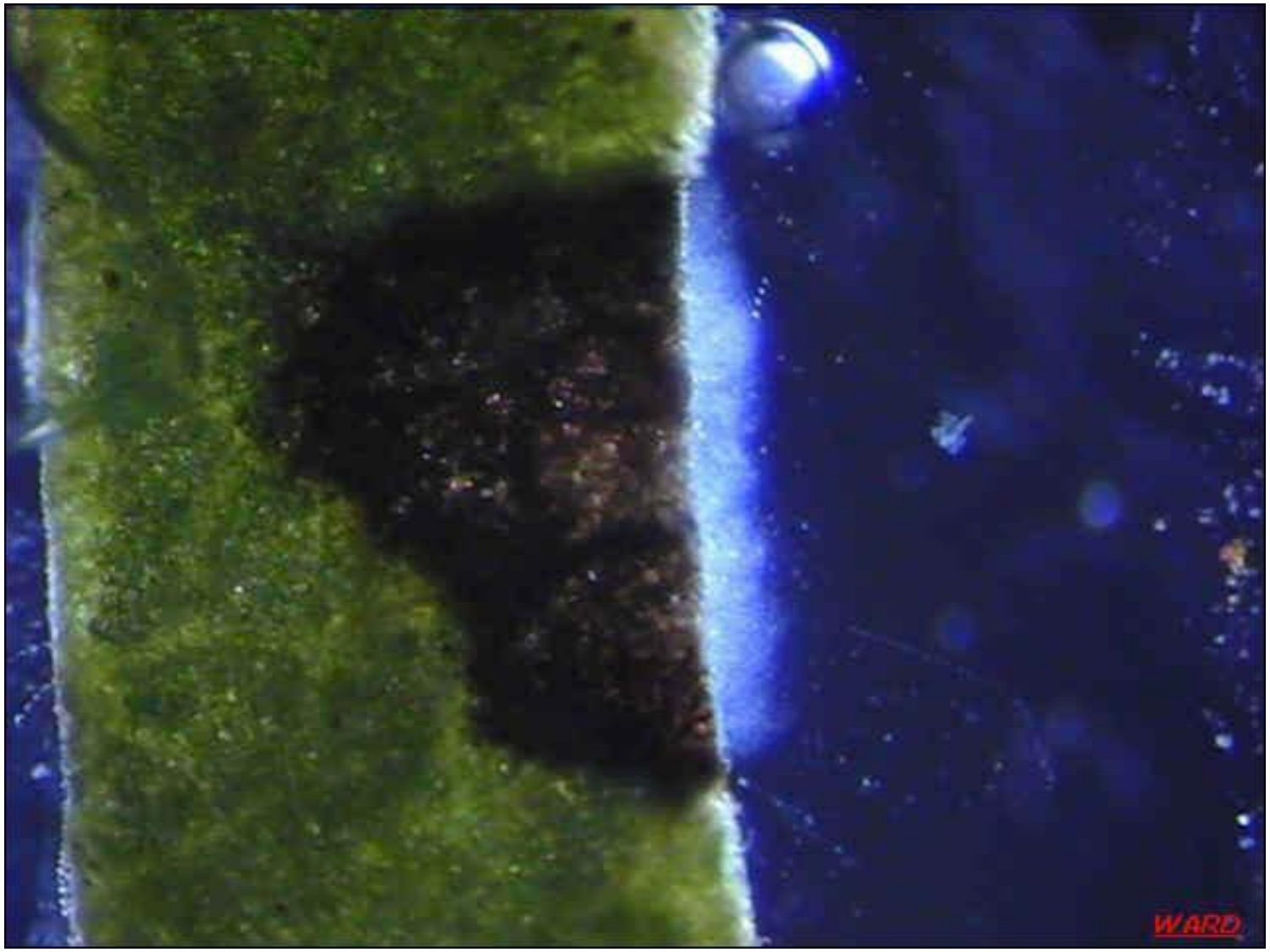

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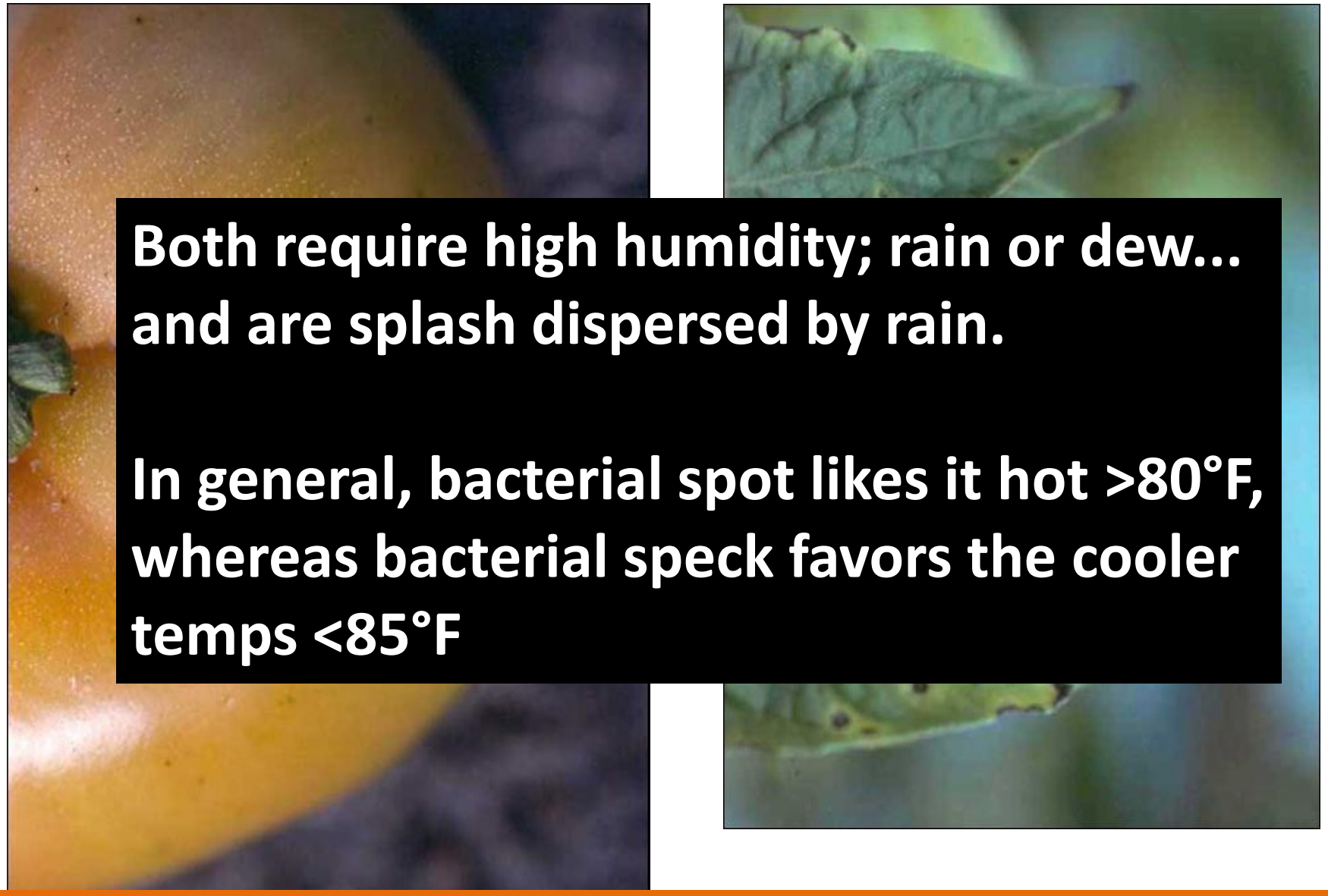
Bacterial Speck – affects Tomato
(*Pseudomonas syringae* pv. *tomato*)



Both require high humidity; rain or dew... and are splash dispersed by rain.

In general, bacterial spot likes it hot >80°F, whereas bacterial speck favors the cooler temps <85°F

Bacterial Speck – affects Tomato
(*Pseudomonas syringae* pv. *tomato*)

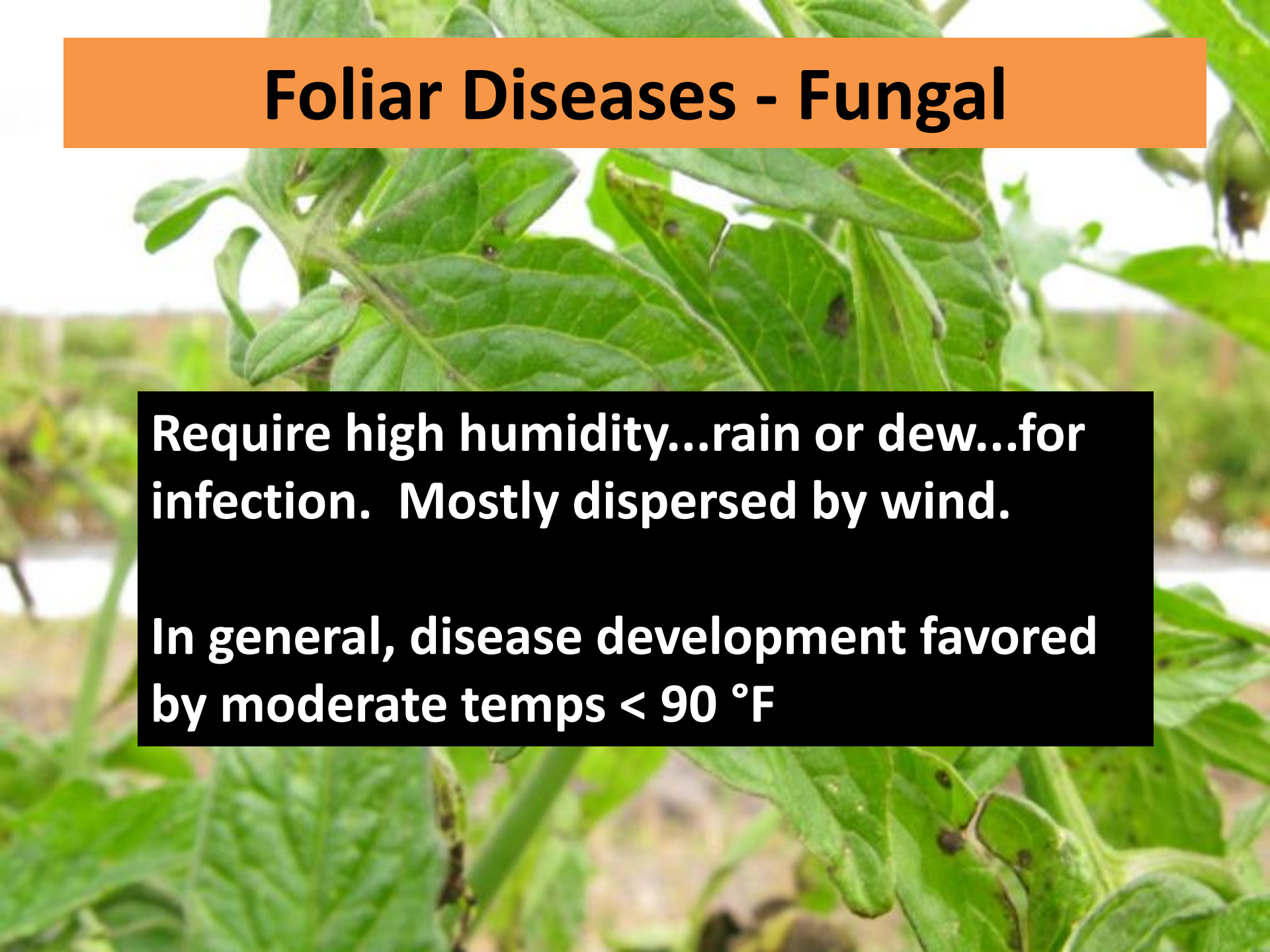
Bacterial Speck and Bacterial Spot

Management:

- Crop rotation – avoid rotations among Solanaceae
- Sanitation – remove plant debris and volunteers
- Solanaceous weeds – serve as reservoir
- Avoid handling wet foliage
- Host Resistance – available in pepper and tomato for bacterial spot
- Chemical control – copper-based fungicides combined with mancozeb/maneb (Cu-tolerance)
- Healthy, disease-free transplants
- Avoid growing tomatoes during summer months...heavy rains

Foliar Diseases - Fungal

Foliar Diseases - Fungal



Require high humidity...rain or dew...for infection. Mostly dispersed by wind.

In general, disease development favored by moderate temps < 90 °F

Target spot affects tomato
(Corynespora cassiicola)

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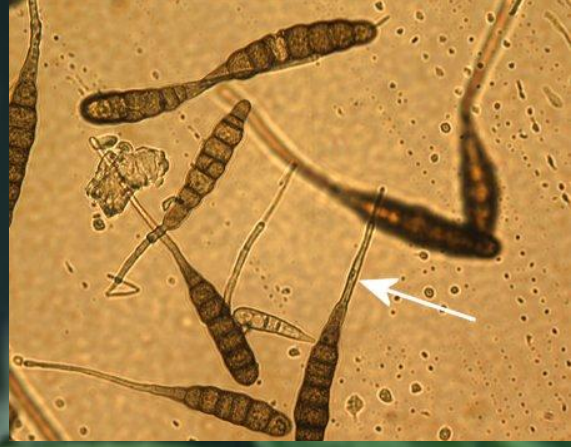


Early Blight affects tomato and eggplant (*Alternaria solani / A. tomatophilia*)

Anthracnose affects pepper and tomato (*Colletotrichum spp.*)

Foliar Fungal Diseases

Management:

- Crop rotation – avoid rotations among Solanaceae
- Sanitation – remove plant debris and volunteers
- Solanaceous weeds – serve as reservoir
- Maintain proper fertility
- Chemical control – neem oil, copper, maneb, mancozeb, and chlorothalonil
- Healthy, disease-free transplants

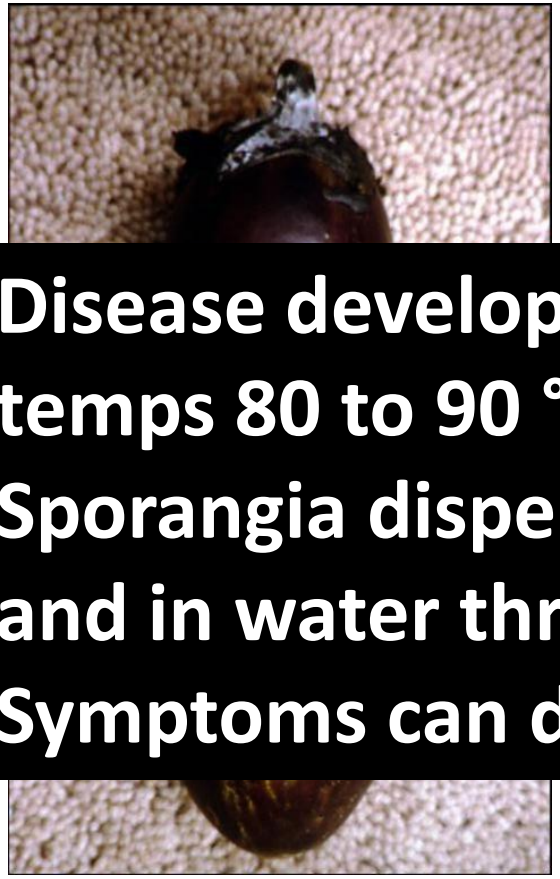
Late Blight affects tomato (*Phytophthora infestans*)

Disease development favored by cool temps < 85 °F and high humidity.
Sporangia dispersed by wind.
Symptoms can develop *RAPIDLY*...

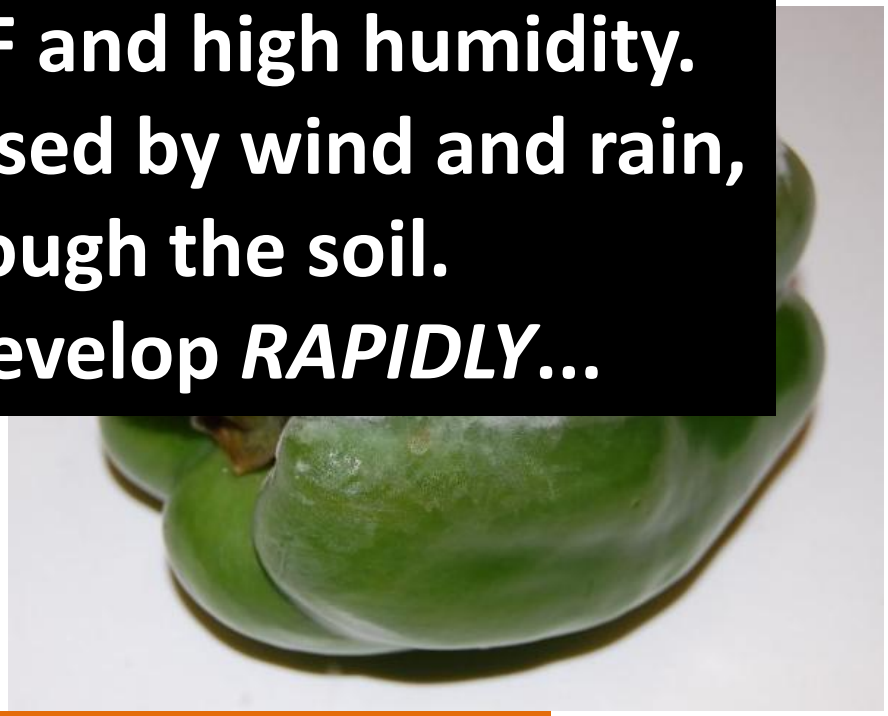
Late Blight affects tomato (*Phytophthora infestans*)

David B. Langston, University of Georgia, Bugwood.org

Phytophthora Blight and Fruit Rot (*Phytophthora capsici*) affects tomato, pepper and eggplant



Disease development favored by cool temps 80 to 90 °F and high humidity. Sporangia dispersed by wind and rain, and in water through the soil. Symptoms can develop *RAPIDLY*...



Phytophthora Blight affects pepper and eggplant (*Phytophthora capsici*)

Foliar Fungal Diseases

Management: (Late Blight & Phytophthora Blight)

- Crop rotation – avoid rotations among Solanaceae (tomato & potato)
- Sanitation – remove plant debris and volunteers
- Prevent contact of fruit and foliage with bare soil (Phytophthora Blight & Fruit Rot).
- Solanaceous weeds – serve as reservoir
- Chemical control – neem oil, phosphorous acid, copper, maneb, mancozeb, and **chlorothalonil**
- Healthy, disease-free transplants

Vascular Wilt Diseases

Fusarium Wilt (*F. oxysporum* f.sp. *lycopersici*) affects tomato
Verticillium Wilt (*V. albo-atrum* & *V. dahliae*) affects all Solanaceae

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Bacterial Wilt – affects tomato, pepper and eggplant (*Ralstonia solanacearum*)

Bacterial Wilt – affects tomato, pepper and eggplant (*Ralstonia solanacearum*)

Bacterial Wilt – affects tomato, pepper and eggplant (*Ralstonia solanacearum*)

Vascular Wilt Diseases

Management:

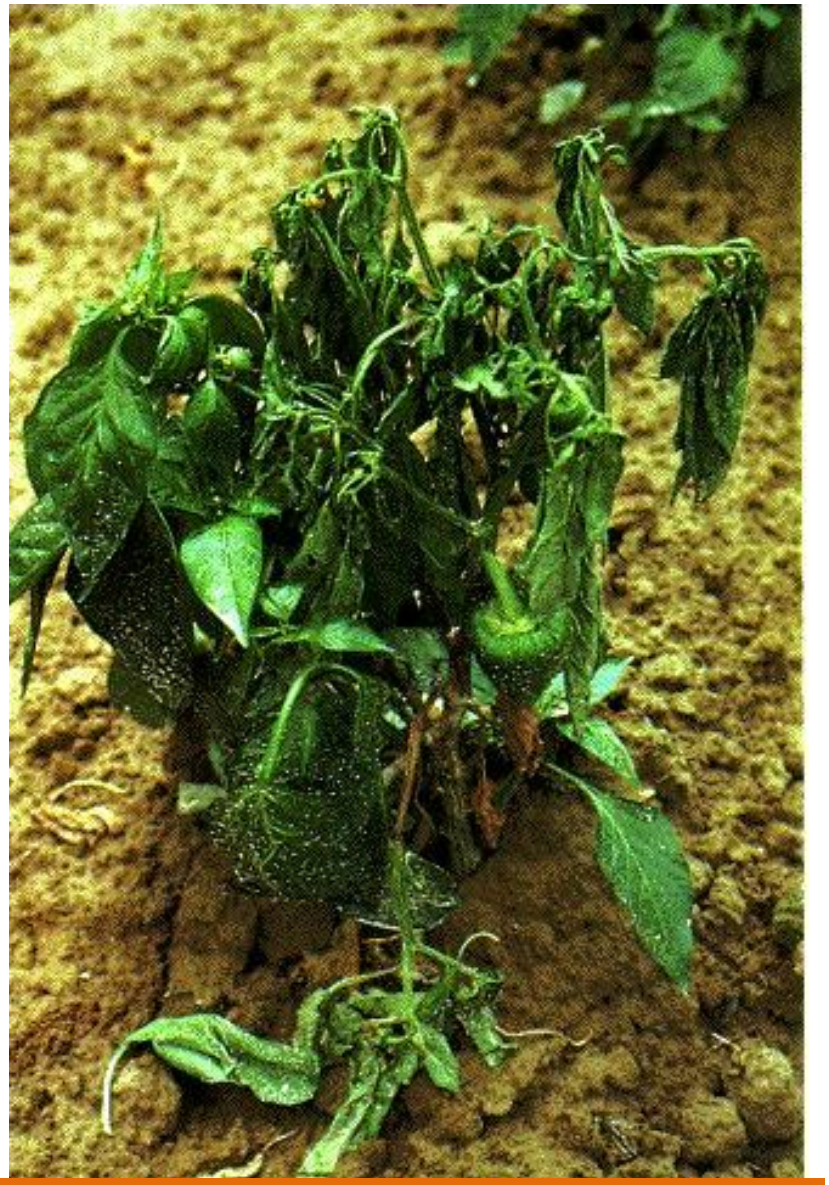
- Crop rotation – avoid rotations among Solanaceae.
- Sanitation – remove plant debris and volunteers
- Weeds – serve as reservoir
- Avoid areas with poor drainage (Bacterial wilt)
- Resistant varieties for Fusarium & Verticillium wilts (several races)
- Healthy, disease-free transplants
- Chemical control – none (soil fumigants)
- Can solarize soil (small scale) or use pasteurized soil in containers.

AVOIDANCE!

Root & Crown Diseases

Fusarium Root and Crown Rots affects tomato
(*Fusarium oxysporum* f.sp. *radicis-lycopersici)*

Root and Crown Rots affects tomato, pepper and eggplant (*Phytophthora spp., Fusarium spp., Pythium spp., Rhizoctonia spp.*)



Root and Crown Rots affects tomato, pepper and eggplant (*Phytophthora spp., Fusarium spp., Pythium spp., Rhizoctonia spp.*)

Damping-Off affects tomato, pepper and eggplant (*Fusarium spp.*, *Pythium spp.*, and *Rhizoctonia spp.*)

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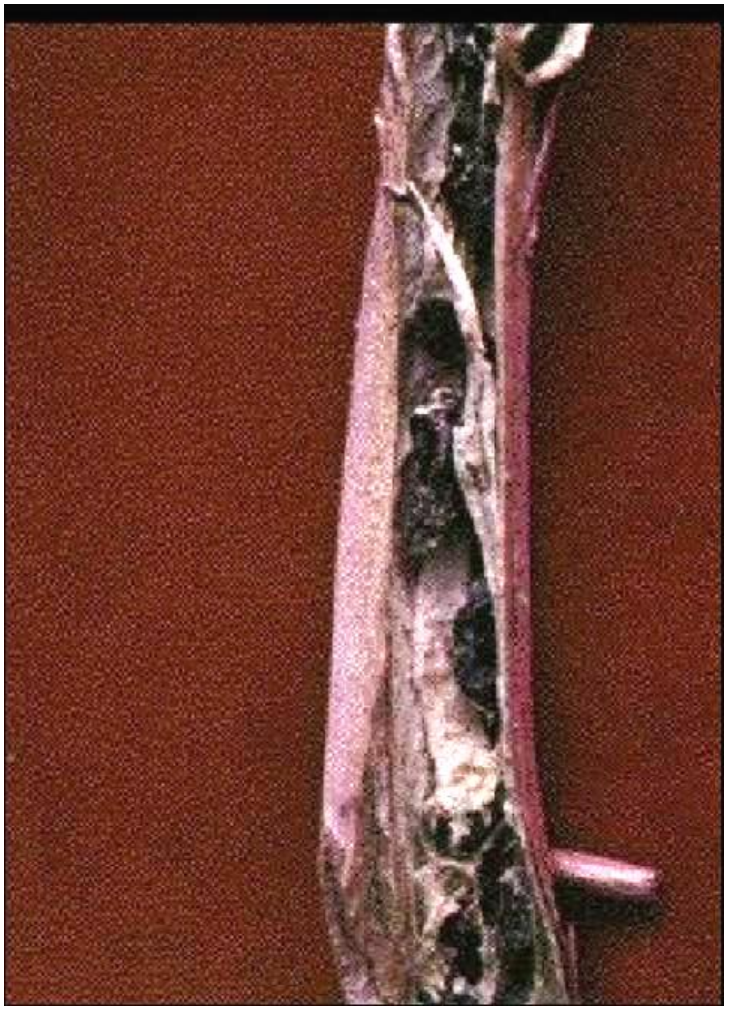

Southern blight (*Sclerotium rolfsii*) - sclerotia the size of mustard seed

Sclerotina (*Sclerotium rolfsii*) - sclerotia the size of rabbit droppings

Crown & Root Rot and Damping-off Diseases

Management:

- Crop rotation – avoid rotations among Solanaceae.
- Sanitation – remove plant debris and volunteers (*Sclerotium* & *Sclerotinia*)
- Weeds can act as reservoirs
- Avoid areas with poor drainage
- Avoid high levels of undecomposed plant matter (Damping-off).
- Healthy, disease-free transplants
- Chemical control – limited
  - PCNB for Rhizoctonia & southern blight)
  - Can solarize soil (small scale) or use pasteurized soil in containers.

Root Knot affects tomato, pepper and eggplant (*Meloidogyne spp.*)

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Viral Diseases

Scott Bauer, USDA Agricultural Research Service, Bugwood.org

***Tomato yellow leaf curl virus* (TYLCV) affects tomato**
- Transmitted by silverleaf whitefly

Tomato spotted wilt virus **(TSWV) affects tomato, pepper & eggplant**
- Transmitted by the western flower thrip

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Symptoms:

- Young leaves turn bronze in color
- Numerous small, dark spots on leaves
- Plants appear wilted
- Tips dieback
- Dark streaking of the terminal stems
- Stunting
- Chlorotic ringspots & raised bumps on fruit
- Deformed fruit

***Tomato spotted wilt virus* (TSWV) affects tomato, pepper & eggplant**
- Transmitted by the western flower thrip

Viral Diseases

Management:

- Resistant varieties – available for tomato (TYLCV & TSWV) and pepper (TSWV)
- Sanitation – rogue infected plants!
- Solanaceaous weeds – serve as reservoir
- Control insect vectors
- Healthy, disease-free transplants

**Avoid handling Solanaceous plants after handling tobacco products...especially if you grow heirloom varieties.


Questions?