

Apple Disease Identification and Management for Homeowners

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Apple Disease Challenges in the S.E.

- Several apple diseases to contend with



Apple Disease Challenges in the S.E.

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- Paucity of disease resistant cultivars
 - Breeding efforts focus on consumer preference
 - Usually single-disease resistance



<http://www.eatlikenoone.com/prima-apples.htm>



<http://www.eatlikenoone.com/enterpris-apples.htm>



<http://kuffelcreek.wordpress.com/>



<http://www.eatlikenoone.com/pristine-apples.htm>



http://www.plant.photos.net/index.php?title=File:Apple_williams_pride.jpg



http://www.plant.photos.net/index.php?title=File:Apple_liberty.jpg

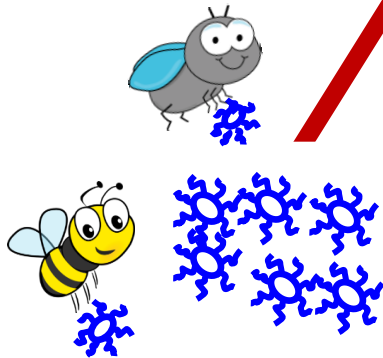
Apple Disease Challenges in the S.E.

- Warm, humid climate
 - Favorable for pathogen infection and disease development
 - Inadequate chilling hours: longer period of susceptibility to blossom infection

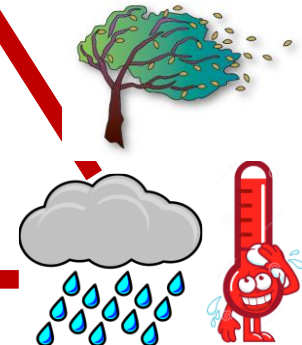
Susceptible Host



Biology and availability of pathogen



Conductive Environment



Apple Disease Challenges in the S.E.

- Maintaining practices of fungicide resistance management and maximum annual applications
 - Commercial apple growers in Hendersonville NC: Up to 24 fungicide applications in 2017!

Multi-site Protectants	Single-site Fungicides	Biologicals
Mancozeb	Group 3: S.I.'s	<i>Bacillus</i> spp.
Captan	Group 11: “Strobys”	<i>A. pullulans</i>
Copper	Group 7: SDHIs	
Sulfur	Group 1: “T-Methyl”	
ziram	U12: Dodine	
Phosphorous Acid		

Apple Diseases: Fire Blight

Fire Blight: *Erwinia amylovora* (Bacteria)



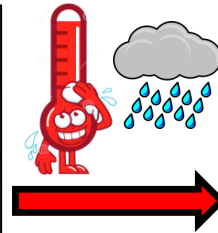
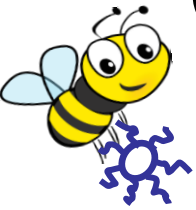
- Infects blossoms, shoots, scion (trunk), and rootstock
- Pollinators bring bacteria to open flowers-travels throughout tree (“systemically”)

Apple Diseases: Fire Blight

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- Blossom blight

- Petal fall: Darkening of petiole or base of flower, ooze (orange, amber, white)



- Mummy or blight?



Apple Diseases: Fire Blight

- Shoot blight
 - Symptoms: Shepherd's crook, blackening/necrosis of leaf mid-vein and pedicel
 - Reduces bearing wood for following season



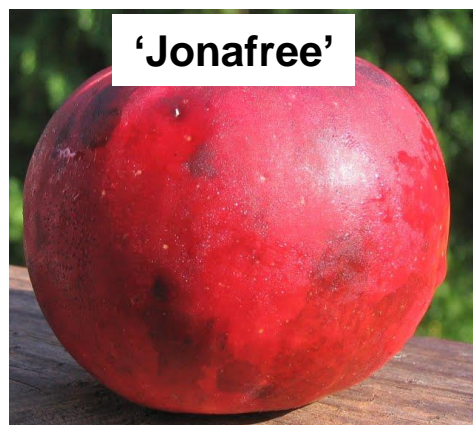
Apple Diseases: Fire Blight

- Canker Blight
 - Narrow, water soaked-zone in healthy tissue bordering cankers, ooze droplets in spring
- Rootstock Blight
 - Systemic infection of rootstock from blossom or shoot blight
 - Managed with resistant rootstocks
- Trauma Blight
 - Results from wounds caused by hail, wind, animals (deer)



Fire Blight Management in Home Orchards

- Cultural Control
 - Pruning cankers (wood with previous infections) at least 12 inches from infection margin
 - Prune during late winter (ideal), or aim to prune in later summer on dry day
 - Remove cut wood from tree area and destroy
- Plant resistant rootstocks and “resistant” cultivars



<http://adamapples.blogspot.com/2011/10/jonafree.html>



Fire Blight Management in Home Orchards

- Chemical Management
 - Late Dormant to Green Tip: Copper
 - Bloom: Models + Streptomycin (Agri-strep) OR Copper + Mancozeb
 - Petal Fall (shoot blight control): Copper (phytotox. concern)

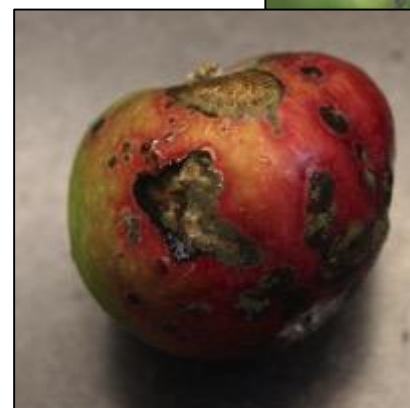


Apple Diseases: Apple Scab

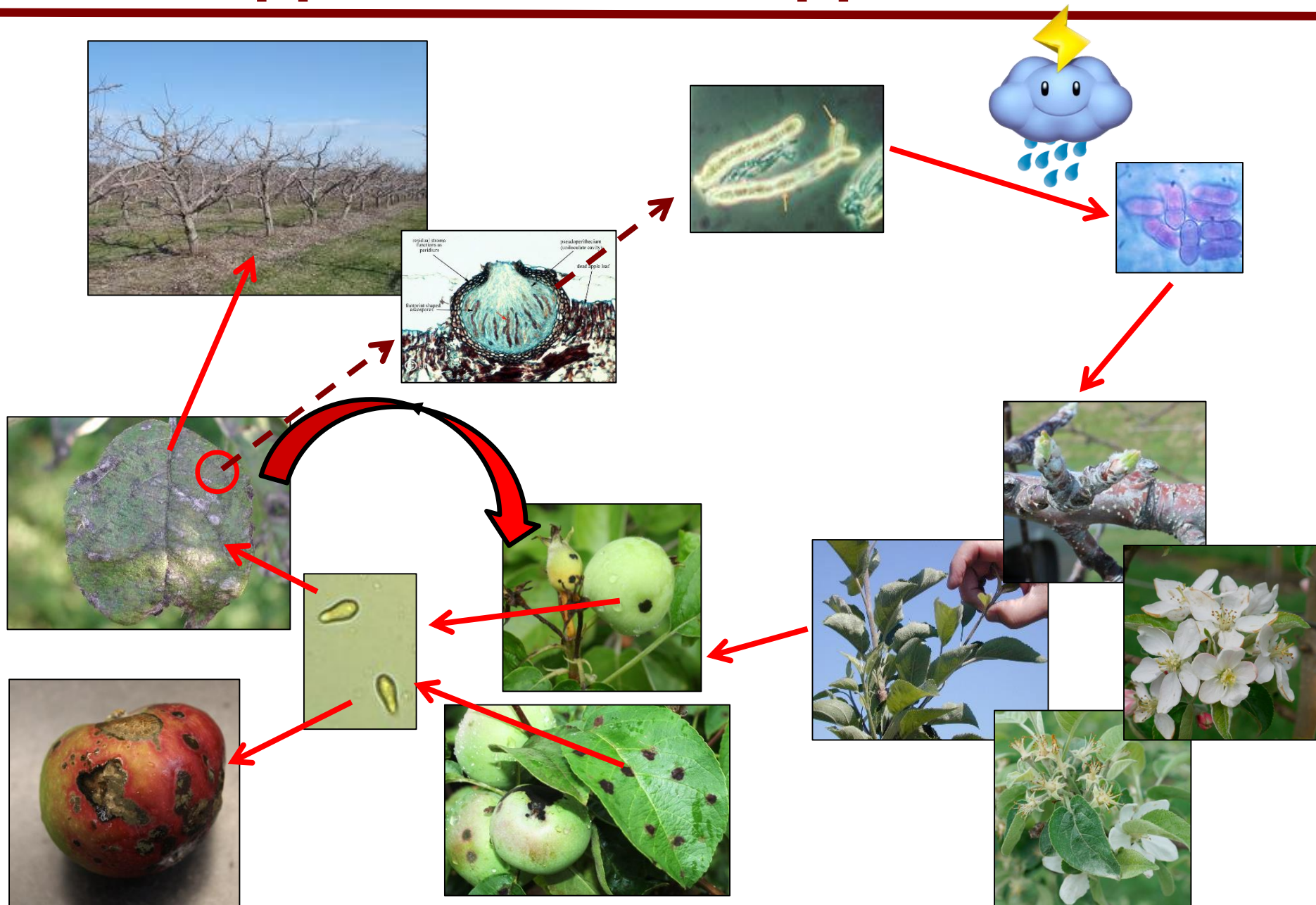
“Early Season Diseases”

• Apple Scab

- Early: Causes lesions on leaves and fruit
- Late: Premature defoliation, fruit cracking
- Cool, humid spring climate + highly susceptible cultivars: favorable infection conditions
- Management: Green Tissue through 1st cover (primary infection, then scout)

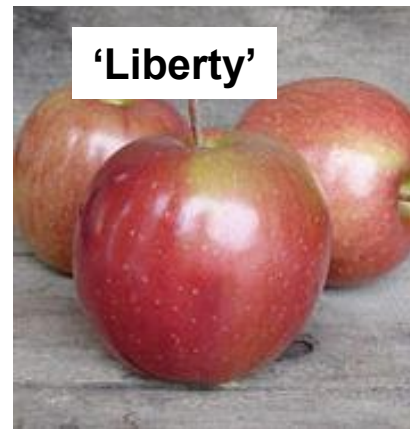
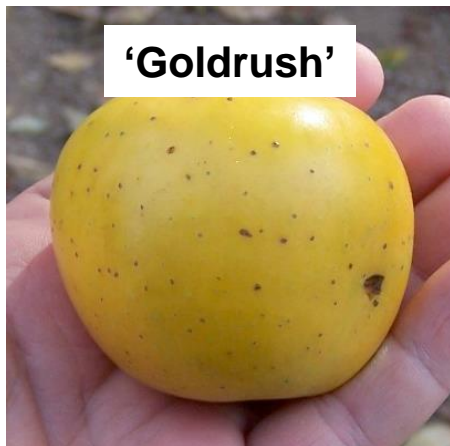


Apple Diseases: Apple Scab



Apple Scab Management in Home Orchards

- Cultural Control/Sanitation
 - Horticultural practices that promote fast drying conditions
 - Mulch/flail mow leaves in autumn, remove all leaf liter, urea application
- Plant resistant cultivars (25+ available)



<http://www.hebofrut.com/wp-content/uploads/2014/11/Modi-mittel.jpg>

Apple Scab Management in Home Orchards

- Chemical Control
 - Necessary for scab management on susceptible cultivars
 - For homeowners: most available fungicides are protectants
 - 7 to 14 day fungicide application interval: less if rain

Multi-site Protectants	Single-site Fungicides	Biologicals
Mancozeb	Group 3: Myclobutanil (Immunox)	
Captan 50 WP	Group 1: T-Methyl (3336 WSP): Resistance!	
Copper		
Wettable Sulfur		

Apple Diseases: Cedar Apple Rust

- **Cedar Apple and Quince Rust**

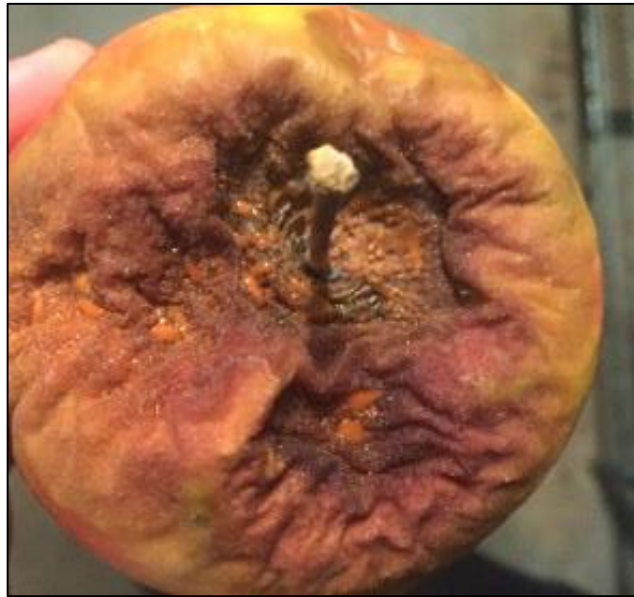
- Two hosts needed: cedar and pome (i.e. apple)



- Management: Alternate host removal, sanitation of galls, fungicides (myclobutanil and mancozeb pink bud to 10 days after petal fall)

Apple Diseases: The Summer Rots

Bitter Rot



- Scouting: Orange/salmon colored spores in concentric ring
 - Yellow skinned cultivar: Red ring around lesion
 - “V” rot in flesh
- Affected cultivars: Most! Even ‘Rome Beauty’ and ‘Red Delicious’ (“moderately resistant”)

Apple Diseases: The Summer Rots

White Rot



- Scouting: Tiny red/brown spots around fruit lenticels
 - Turgid fruit
 - Red-skinned cultivars: Bleached appearance; Yellow-skinned: Red halo around lesion
 - Symptoms not apparent until 4-6 weeks before harvest

Summer Rot Management in Home Orchards

- Cultural/Sanitation
 - Open canopy to encourage air movement and rapid drying
 - Mummy and canker removal



- Chemical Control
 - Mancozeb (until bloom)
 - Captan and/or thiophanate methyl (3336 WSP): 10 days after petal fall until harvest (14 day interval)

Thanks for your attention!

Any Questions?



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