MEET APPLE SCAB & FIRE BLIGHT – TWO MOST SERIOUS PROBLEMS IN POME FRUITS

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Symptoms
- The infection usually develops first on the underside of the leaves on fruit spurs as they unfold
- On fully unfolded leaves, infection can start on both sides of the leaves
- Lesions are velvety as a result of abundant development of conidia
- Fruit infections resemble leaf infections when young, than turn black and corky

Orchard Critical Stages for Apple Scab
- Early spring from:
  - Green tip
- Until the end of the ascospore discharge which can take 9-12 weeks

Apple Scab
- Overwintering in lesions on infected leaves and fruit
- Spore discharge slightly before or at green tip
- Fruit infections on newly developing leaves
- Spore discharge slightly before or at green tip
- From the leaf lesions, lesions infect the secondary infections
- Infecting young emerging leaves

Forecasting Apple Scab Infections
- Mills table: as a function of minimum hours of wetting at a certain temperature needed for infection to occur
- MacHardy-Goduy model: predicting spore maturation and release based on degree day accumulation above 32°F

Roto-Rods for Spore Trapping
- Deep-cycle 12 V battery
- Electro-motor
- Moisture activated switch
Apple Scab Management for Gardeners

- Prevention: Plant resistant cultivars
- Sanitation: rake leaves and/or apply low rate nitrogen fertilizer to break down litter

Disease Resistant Varieties

<table>
<thead>
<tr>
<th>Very Early</th>
<th>Early</th>
<th>Mid-Season</th>
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<tbody>
<tr>
<td>Pristine</td>
<td>Redfree</td>
<td>William’s Pride</td>
</tr>
<tr>
<td>Jonafree</td>
<td>Wolf River</td>
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</tbody>
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Disease Resistant Varieties

<table>
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<tr>
<th>Late</th>
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<tr>
<td>Liberty</td>
<td>Enterprise</td>
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<tr>
<td>Adams’ Pippin</td>
<td>Gold Rush</td>
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Additional Disease-Resistant Crabs

- Adirondack
- Firebird
- Raspberry Spear
- Sargent
- Sprinkling Spite
- Zumi

In Summary...

- Orchard assessment for the amount of the inoculum present will help in predicting the severity of the scab infections.
- During critical stages in the annual cycle both, Mill’s and MacHardy-Gadoury methods provide reliable guidelines in predicting the primary scab infections.
- Lesions with conidia present may be visible 9-17 days after the wetting period that produced an infection.
FIRE BLIGHT

Microscopic one-celled organisms
- It is a warm/hot-weather disease
- Temperatures favoring bacterial development is above 65°F (70°F – 81°F)
- High humidity, rain, hail, high winds, even sprays

Bacterial Pathogens

Apple Flower Bud Phenology

Mirjana Bulatovic-Danilovich, WVU Extension Horticulture Specialist

Old Fire Blight Canker

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…Someone walks into your office bringing you these “beauties”…

Bacterial Movement

- Old overwintering canker as source of infection
- Oozing bacteria - Bartlett Bacteria
- “overtaking” stem, leaves and fruit

Photos by: M. Bulatovic-Danilovich

What to Do About It?

- Start early - look for CANKERS
- Copper spray as trees break dormancy
- For Blossom Blight Control
  - Copper WP (Copper hydroxide)
  - NuCop50DF (Copper hydroxide)
  - base Cu+Cu(Copper hydroxide pentahydrate)
  - Mega Oxi (Oxalic acid, Cu-oxalate pentahydrate, Cu-oxalate monohydrate and Cu hydroxide)
  - WE WP (Copper hydroxide)
  - Staphylococcus albus, Citrobacter, Bacillus subtilis – tramp the soil at the root and in
  - Oomycetes (Phytohemagglutinin, P. schleidenii – when this is M, M, M)
  - Generic (Bacillus subtilis QST 734) – when this is M, M, M

Biological Options

- LifeGuard (Bacillus mycoides, isolate 1 or BmJ) - triggers an induced resistance (IR) to the pathogen
- ArtGard induces the natural systemic-activated resistance (SAR) response.
- Blossom Protect (Aureobasidium pullulans) – yeast-like fungus isolated from apple orchards, occupies the sites necessary for fire blight infection development
- Serenade Opti (Bacillus subtilis) – bactericide and fungicide – has a direct contact effect on fire blight pathogen and competitive blossom colonization displacing Erwinia amylovora

Shoot Blight Control

- Apogee (prohexadione-Ca)
  - 1st App. at King Bloom (Petalfall) followed with 2-3 more applications 2 weeks apart
Fire Blight Management Summary

- **Prevention:**
  - Plant resistant varieties: Red delicious, Enterprise, Gold Rush, Wolf River
  - Avoid: Braeburn, Fuji, Gala, Golden delicious, Jonathan, Rome...

- **Sanitation:**
  - Prune out infected shoots and limbs, remove cankers (cut >12” below visible canker symptoms)

- **Cultural management:**
  - Cut down on nitrogen fertilizers
  - Start disease management early

Useful links


Erwinia amylovora

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