Peach and Plum

Wednesday morning 9:00 am

**Where:** Grand Gallery (main level) Room C  
**MI Recertification credits:** 2 (1C, COMM CORE, PRIV CORE)  
**OH Recertification credits:** 1.5 (presentations as marked)  
**CCA Credits:** SW(0.5) PM(1.0) CM(0.5)  
**Moderator:** Will Bristol, MSHS Board, Romeo, MI

9:00 am  Plums, Pluots, Flat Peach, and Other Novel Stone Fruits (OH: 2B, 0.5 hr)  
  - Tom Callahan, Adams County Nursery, Aspers, PA

9:30 am  Update on Management of Bacterial Spot of Peach and Plum (OH: 2B, 0.5 hr)  
  - Bill Shane, Extension Fruit Specialist, MSU Extension, Benton Harbor, MI

10:00 am  Identifying and Managing Fruit Rots of Stone Fruit (OH: 2B, 0.5 hr)  
  - George Sundin, Plant, Soil and Microbial Sciences Dept., MSU

10:30 am  Orchard Soil Health  
  - Greg Peck, Sustainable Fruit Production, Cornell Univ.

11:00 am  Session Ends
PLUMS, PLUOTS AND FLAT PEACHES

EARLY GOLDEN
- Early season plum
- Picks 10-14 days before Shiro
- High-quality fruit
- Very sweet flavor and small size
- Trees are hardy and productive

METHLEY
- Early season plum with good fruit quality
- Sweet, juicy flavor with a distinctive flavor
- Ripens early to mid-July in Adams County
- Self-fertile

SHIRO
- Full yellow plum
- Sweet, juicy flavor
- Clingstone
- Medium size
- Trees are very productive
- Good pollinizer for Methley, Santa Rose and Satsuma

AU ROSA
- Dark red plum
- Medium to large size
- Red flesh
- Moderately productive
**SANTA ROSA**
- Attractive reddish-yellow plum
- Large size
- Firm, yellow flesh
- Excellent eating qualities
- One of the most frequently planted Japanese plums
- Self-fertile and good pollinator
- Fruit buds prone to winter injury in northern climates

**BLACK AMBER**
- Mid-season plum
- Black-red skin with amber flesh
- Large, firm fruit
- Susceptible to bacterial spot in areas of high stress

**WICKSON**
- Yellow plum with yellow flesh
- Vigorous tree but shy cropper
- Not considered to be a good pollenizer

**SATSUMA**
- Dark red plum with red flesh
- Oval shaped fruit with medium size
- Very sweet flavor
- Tree is very productive
- Susceptible to cracking in prolonged wet periods

**VANIER**
- Wickson x Burbank cross
- Yellow fleshed, clingstone
- Matures one week after Wickson
- Trees are vigorous and productive

**QUEEN ROSA**
- Dark, red-purple plum with red flesh
- A USDA release
- Picks five to seven days after Santa Rosa
- Queen Rosa has been more productive than Santa Rose under eastern conditions
**Ruby Queen**
- Reddish-black plum with red flesh
- Picks three to four weeks after Santa Rosa
- Adapts well to humid climates
- Outstanding flavor
- High soluble solids

**Fortune**
- Reddish-purple plum with yellow flesh
- Picks late August in Adams County
- Large size
- Very firm
- Long storage life
- Cross pollination with other Japanese plums recommended

**European Plums**

**Castleton™**
- A Valor x Iroquois cross
- Released by Cornell University
- Blue, oval fruit
- Picks about three weeks ahead of Stanley
- Heavy producer

**Long John**
- Fresh market prune-type
- Picks mid-season
- Dark blue fruit
- Very large, oblong size
- High fruit quality
- Trees are very productive

**NY9®**
- (Kenmore Cltv.) PP#14,020
- Released by Cornell University
- Freestone plum with yellow flesh
- Picks in Stanley season
- More productive and disease resistant than Stanley
- Self-fertile
- Highly resistant to black knot
**STANLEY**
- Developed by the New York State Agricultural Experiment Station
- Prune-type plum for fresh markets and processing
- Excellent quality with juicy, fine-grained flesh
- Large fruit with dark blue skin
- Tree is early bearing
- Good pollinator for other European types

**BLUEBYRD**
- Released by USDA
- Excellent for both commercial and home garden use
- Blue fruit with amber flesh
- Large size
- Excellent flavor with high sugar content
- Shown great resistance in black knot
- Requires cross pollination

**VALOR**
- Developed by Vineland in Ontario, Canada
- Ripens a few days after Stanley
- Purple-blue plum with yellow flesh
- Medium to large size
- Semi-freestone
- Great fresh market potential

**VICTORY**
- Developed by Vineland in Ontario, Canada
- Picks five days after Stanley
- Heart-shaped fruit with dark blue skin and yellow flesh
- Great selection for fresh market

**VISION**
- Developed by Vineland in Ontario, Canada
- Late harvest plum
- Picks six days before President
- Fruit is dark blue and oblong shaped
- High quality
- Plant with Stanley or Victory for best cross pollination

**PRESIDENT**
- Latest maturing European plum
- Large, oblong fruit
- Dark blue coloring with orange flesh
- Recommend using Stanley for cross pollination
- Resistance to black knot
**PLUM HYBRIDS**

- Plum x apricot hybrid
- Released by Dick Okie of USDA-ARS
- Matures in early July
- Purple finish with red-yellow flesh
- Outstanding flavor
- Resistance to bacterial spot and bacterial canker

**FLAVOR QUEEN**

- Developed by Zaiger Genetics
- Medium to large fruit
- Pleasantly sweet flavor
- Dapple Dandy is a recommended pollinator

**SWEET PIXIE 2**

- Interspecific plum/cherry cross from Zaiger Genetics in Modesto, CA
- Fruit is larger than a cherry yet smaller than a plum
- Hangs well on tree for prolong harvest
- Brix average: 20
- Deliciously sweet flavor
- Commercial sales only!

**DAPPLE DANDY**

- Developed by Zaiger Genetics
- Large fruit with purple coloring
- Firm, dark flesh
- Exceptional dessert qualities

**FLAVOR KING**

- Developed by Zaiger Genetics
- Reddish-purple fruit with red flesh
- Late season Plum® – picks in September in Adams County
- Medium size
- Very firm
- Requires cross pollination
FLAVOR GRENADE
- Developed by Zaiger Genetics
- Red color over a brilliant yellow background with yellow flesh
- Excellent dessert quality
- Very productive
- Hand thinning required
- Can be planted at a higher density than most Pluots®

FLAVOR HEART
- Developed by Zaiger Genetics
- Late season Pluot® that picks in early September in Adams County
- Heart shaped fruit
- Very dark purple skin with yellow flesh
- Pleasantly sweet flavor
- Quickly ripens on tree

FLAVORICH
- Developed by Zaiger Genetics
- Very late maturing
- Dark purple skin with yellow orange flesh
- Fruit is firm with sweet flavor
- Tree is upright and very productive
- Pollination required

OPPORTUNITIES IN FLAT PEACH PRODUCTION

BUENOS™II
- (NJF 15 Cltv.) PP#20,128
- Outstanding yellow-fleshed flat peach
- Developed by Rutgers University
- Picks three days before Redhaven
- Very little stem pull
- Resistant to bacterial spot

SATURN
- Delicious white-fleshed flat
- High sugar content
- Vigorous tree – requires thinning
- Picks right after Redhaven
- Extremely winter and spring bud hardy
**GALAXY**
- Developed by USDA-ARS San Joaquin, CA
- Outstanding white-fleshed flat
- Very firm fruit with great eating qualities
- Very large size for a flat – up to 2 ¾ - 3 inches in diameter
- Long hang time
- Can be spring tender

**TANGOS®**
- (NJF16 Cltv.) PP#18,997
- Picks 5 days after Saturn
- Excellent size, firmness and flavor
- Developed by Rutgers University
- Resistant to bacterial spot

**TANGOS® II**
- (NJF17 Cltv.) PP#19,383
- Developed by Rutgers University
- Picks one week after Saturn
- Greenish yellow skin and flesh
- More difficult to grow than TangOs
- Resistant to bacterial spot

**ACN**
- NEW OPPORTUNITIES IN PEACH & NECTARINE PRODUCTION

**NECTARINES**
- (NJN101 Cltv.) PP#23,882
- Harvest 10 days before Redhaven
- Out performs others in its season when it comes to color, flavor and productivity
- Exhibits high tolerance to bacterial spot
• (NJN102 Cltv.) PPAF
• New Rutgers release
• Yellow-fleshed nectarine
• Semi-freestone
• Ripens a week before Redhaven
• Solid scarlet coloring
• Nice, acidic flavor

• (NJN103 Cltv.) PPAF
• New Rutgers release
• White semi-clingstone nectarine
• Ripens before Redhaven, after Sentry
• Larger and more attractive than other whites in its season
• Nice, acidic flavor

• (NJ357 Cltv.) PPAF
• New Rutgers release
• Semi-freestone yellow-fleshed peach
• Low acid
• Ripens with Redhaven
• Overlaps White Lady
• Very firm fruit
• Large size
• Very attractive, full scarlet coloring
• High tolerance to bacterial leaf spot

• (NJ358 Cltv.) PPAF
• New Rutgers release
• Late-season yellow freestone peach
• Ripens around Encore season, 32 days after Redhaven
• Nice, acidic flavor
• Beautiful coloring
• Excellent, large size
• High tolerance to bacterial leaf spot
WHITE-FLESHED PEACHES

ADAMS COUNTY NURSERY, INC.

- (NJ354 Cltv.) PP#23,669
- A very attractive early-season freestone white peach
- Vigorous producer of firm, sweet fruit
- Picks about a week before Redhaven
- Highly tolerant of bacterial leaf spot

JULY ROSE™

- (NJ354 Cltv.) PP#23,669
- A very attractive early-season freestone white peach
- Vigorous producer of firm, sweet fruit
- Picks about a week before Redhaven
- Highly tolerant of bacterial leaf spot

SCARLET ROSE™

- (NJ355 Cltv.) PP#23,883
- Early season white clingstone
- Great eating qualities
- Mildly sub-acid
- Picks a few days before Redhaven
- Follows July Rose™
- Firm fruit hangs well on the tree for up to two weeks after maturity without significant loss of quality

AUGUST ROSE™

- (NJ356 Cltv.) PP#23,884
- A very attractive late season white fleshed freestone peach
- Picks about 4 weeks or more after Redhaven with a long hang time
- Replaces Snow King season
- Great eating qualities
- Fruit exhibits a pleasant rose aroma
- Flavor mildly sub-acid to acid
- High tolerance to bacterial spot and constriction canker
Impact of bacterial spot
Bacterial spot is an important disease of peaches, nectarines, apricots, and plums caused by *Xanthomonas arboricola pv. pruni*, formerly *Xanthomonas campestris pv. pruni*. Symptoms of this disease include fruit spots, leaf spots, and twig cankers. Fruit symptoms include pitting, cracking, gumming, and water-soaked tissue. Fruit infected by bacterial spot are more susceptible to other fruit diseases such as brown rot and rhizopus, as well as infestations by insects. Severe leaf spot infections can cause early defoliation. Severe defoliation can result in reduced fruit size, and sunburn and cracking of fruit. Early defoliated trees can be less vigorous and more prone to winter damage.

Factors affecting bacterial spot severity
The pathogen overwinters in diseased twigs with black tip symptoms showing up during spring green up. The black tip symptoms are the result of small somewhat inconspicuous 1/2” to 3” water soaked, gummy spring cankers that girdle twigs, causing tip dieback.

Spread from the spring cankers will eventually cause bacterial spot symptoms on leaves, but these not usually noticed until after bloom. Leaf symptoms can occur earlier if conditions are highly favorable for bacterial multiplication.

Fruit are very susceptible to infection after shuck split with the susceptibility decreasing after pit hardening in mid to late June in southern Michigan. A few weeks before harvest, fruit become more susceptible to bacterial spot infection, however, symptoms are more superficial.

Bacterial spot multiplication is favored by wet conditions that cause water congestion in plant tissue (Zehr et al). Rains, dew, and high relative humidity assist bacterial entry into plants and multiplication. Spread and entry of the bacterial spot pathogen into plants is favored by abrasions and nicks caused by blowing sand, especially on outside peach rows adjacent to field roads. High wind speeds from sprayers may also help to spread bacterial spot.

Peach, nectarine, and plum varieties differ in their resistance to bacterial spot, and disease ratings are available from various sources for well-established varieties. Newly developed molecular markers are useful for helping to identify new peach and nectarine varieties with better resistance to bacterial spot. At Michigan State University we currently test for peach fruit resistance of new varieties to bacterial spot using a marker (G6-16) on peach chromosome 6 (Gasic, et al, Yang).

Management of bacterial spot – using plant resistance and orchard design strategies
Whenever possible and practical, the best strategy is to use cultivars with better bacterial spot resistance. This is especially true for orchards in sandy sites prone to the disease. Varieties developed by breeding programs in wet sandy regions will tend to have better bacterial spot resistance than those developed for dry regions such as California. A variety with moderate resistance to bacterial spot may do well in a site sheltered from wind but have unacceptable symptoms in a bacterial spot-prone site or if planted with highly susceptible varieties.
Plant susceptible varieties on the inside of orchard blocks with the most resistant varieties on the exposed orchard edge. Protect trees from strong winds by establishing shelter belt trees on the windward side of the orchard. Another strategy is to establish sod strips between trees and to use gravel or other dust-suppressing methods on nearby dirt roads. Removal of gummy blackened branch tips typical of bacterial spot during spring pruning may help somewhat to reduce inoculum levels.

**Chemical management of bacterial spot**

Compounds available for use on peach and nectarine for bacterial spot include copper and oxytetracycline (Mycoshield and generic equivalents). Syllit is no longer an option as products labels have been rewritten to exclude its use for this disease. Mycoshield (oxytetracycline) is not labeled on plum in Michigan.

Oxytetracycline is generally considered the most effective compound and the least prone to phytotoxicity problems (damage to plant tissue), but also perhaps most likely to lose effectiveness with the appearance of bacterial strains with resistance. However, 2 years of tests in Michigan peach orchards where oxytetracycline has been used have showed little or no evidence for resistance buildup (Sundin and Shane, unpublished). There is some evidence that the hydrochloride form of oxytetracycline (Fireline) is more effective than the calcium form Mycoshield.

Copper sprays are useful for bacterial spot control where needed but with a somewhat greater risk of phytotoxicity. Copper compounds differ in their metallic copper content and labeling, so it is important to check product labels to see if it is indeed labeled for this crop and for the use rates.

The application strategy for bacterial spot of peach and nectarine, developed at North Carolina State University, is to use a decreasing copper dose starting at first green tissue and ending shortly after shuck split (Table 1). Information on use of copper for bacterial spot on plum is not currently available. When using this program, scouting is needed for signs of copper injury before each application. If the amount of copper damage is becoming significant, hold off. If copper is obvious on the foliage, hold off. Lime alone can be applied to help safen the existing copper on the foliage. If there has not been a rain since the last copper application, hold off or skip the next application. Apply no sooner than weekly.

The safety margin for use of copper is relatively small. Copper use will generally cause at least some damage to leaves. Copper is toxic when the dissolved form penetrates into plant tissue. In general, growers should avoid the use of spray additives such as spray oils, foliar nutrients, and any surfactants with penetrating characteristics when applying coppers. Careful calibration and adjustment of spray equipment is needed to make sure applications are uniform for the entire tree.

Monitoring for bacterial spot occurrence and severity close to pit hardening time provides useful information for guiding spray decisions. Orchards relatively free of bacterial spot on peach foliage at this time require less spray coverage than those with obvious disease symptoms.

At present, guidelines for fine tuning chemical applications for bacterial spot on peach based on weather are sketchy (Linvill). Since copper and Mycoshield are strictly preventative compounds, application is needed ahead of weather events favorable for disease development. However, since bacterial spot infections require warm, wet conditions, consulting weather forecast models for upcoming rainy episodes will allow spray programs to be tailored to the actual need.
Table 1. General program for in-season use of copper for bacterial spot suppression on peaches and nectarines (Modified from summary by David Ritchie, North Carolina State University).

<table>
<thead>
<tr>
<th>Stage</th>
<th>Formulated 53%copper (lb/acre)*</th>
<th>Metallic copper (lb/acre)</th>
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<tbody>
<tr>
<td>Delayed dormant</td>
<td>4 to 5</td>
<td>2</td>
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<tr>
<td>7 – 10 day interval</td>
<td>2</td>
<td>1</td>
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<tr>
<td>1 – 5% bloom</td>
<td>1</td>
<td>0.5</td>
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<tr>
<td>Petal fall</td>
<td>0.5</td>
<td>0.25</td>
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<tr>
<td>Shuck split</td>
<td>0.25</td>
<td>0.125</td>
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<tr>
<td>After shuck split switch to Mycosheild</td>
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<td></td>
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</tbody>
</table>

* Example given is for 53% fixed copper, if other formulations are used, use at the same metallic copper per acre rate.

References


