

# Great Lakes Fruit, Vegetable & Farm Market EXPO

December 9-11, 2008

DeVo Place Convention Center, Grand Rapids, MI



## Stone Fruit

**Wednesday afternoon 2:00 pm**

**Where:** Grand Gallery (lower level) Room D

**Recertification credits: 1 (1C, PRIV OR COMM CORE)**

**CCA Credits: PM(1.0) CM(1.0)**

**Moderator:** Brian Putney, MSHS Board, Benzonia, MI

- 2:00 p.m.      New Approaches to Mechanical Blossom and Fruit Thinning of Peaches and Nectarines
- Jim Schupp, Horticulture Dept., Pennsylvania State Univ.
- 2:40 p.m.      Peach and Nectarine Variety Releases from the University of Arkansas
- John R. Clark, Horticulture Dept., Univ. of Arkansas
- 3:10 p.m.      Update on Bacterial Spot and Bacterial Canker Diseases of Stone Fruit
- George Sundin, Plant Pathology Dept., MSU
- 3:40 p.m.      Peach Tree Decline - causes and Remedies
- Bill Shane, District Extension Fruit and Marketing Educator, MSU Extension
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# Peach and Nectarine Variety Releases from the University of Arkansas

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## Introduction

The University of Arkansas peach and nectarine breeding effort began in 1964, led by James N. Moore along with cooperator Roy C. Rom. Much of the early inspiration and breeding material used in the program came from Fred Hough of Rutgers University. The initial focus was mainly on canning-cling cultivars for baby food production. This effort was encouraged by Gerber Products. Co., which had one of its largest processing plants located at Ft. Smith, Ark. Processing peach production was primarily in eastern Arkansas, where high yields of clings could be produced and fruit shipped across the state to the processing facility. The processing cling effort continued until the late 1990s at which time it was terminated.

Moore and Rom also had an interest in fresh market breeding, but not in the area of yellow-fleshed freestones which most peach programs were emphasizing. Their idea was to specialize in other options such as white peaches and nectarines. One of the more unique aspects of the program was that they used non-melting parents in this breeding effort to produce non-melting white peaches along with non-melting nectarines. These areas of emphasis paralleled nicely with the processing peach breeding. They were quite innovative in their thinking as they recognized the potential value of non-melting flesh for fresh-market peaches, allowing a more ripe fruit to be harvested and handled. This idea has expanded now in the commercial marketplace.

In the early 1980s, Hough sent his last shipment of peach breeding germplasm to Moore. In this final installment, unique firmness in low-acid white peaches surfaced. Selections were made from this material and this served as the basis for an enhanced effort in very firm-fleshed fruits (including other sources of firmness than the canning cling peach) with reduced acidity.

The breeding program continued after Rom and Moore retired (1989 and 1996, respectively), and the fresh-market effort moved forward. A focus throughout the life of the program has been bacterial spot resistance. No bactericides are used in the program, and selection pressure for resistance is quite substantial at the site of the breeding, the University of Arkansas Fruit Research Station, Clarksville. This site is also high chill, has winter lows of 5 to 10°F, and receives about 45 inches of rainfall annually.

## Processing Cling Peach Cultivars

The first two releases from the processing cling peach effort were 'Allgold' and 'Goldilocks', introduced in 1983. These were grown to some extent to expand production beyond that of the "Babygold" series, the mainstay of the industry. 'Allgold' particularly added a moderately early, high-quality option with very good bacterial spot resistance. Following in 2000, 'Roygold' and 'GoldJim' were released. 'Roygold' has even earlier ripening, with first harvest approximately June 20. 'GoldJim' is a very high quality processing genotype, ripening near July 20. Both of these cultivars have excellent bacterial spot resistance. All of the Arkansas releases, with the exception of 'Goldilocks', have a golden to orange flesh with no red pigmentation providing for an excellent processed product with no browning from red pigments.

'Goldnine' was released in 2000 also, but its path of evaluation and eventual commercialization deviated from the norm. Tested as Ark. 9, it was brought to Michigan in the 1970s for evaluation by Gerber. It was found to have very good winter survival, and additional test trees were propagated and planted by Gerber growers. Subsequent testing in Arkansas showed a major defect of a large amount of red pigment in the flesh. Processing evaluations were poor, and Ark. 9 was set aside as a potential cultivar. As time moved on, Ark. 9 began to be propagated commercially and sold as Arkansas 9. However, it had not been formally released. The challenge was introducing a cultivar that did not meet the program's quality standards for processing. I remember visiting with a peach specialist from Mexico in the late 1990s, and he told me that Arkansas 9 would be one of the main cultivars planted that year in his region. I decided then and there that it was time for this "child" of the program to have a name. Issues of proprietary rights aside (it could not be patented since it had been in commerce several years), a concern was how to shift the sales name Arkansas 9 to something else. I chose 'Goldnine' with the hope that this name would be used by the nurseries as it was similar to Arkansas 9, but also to include the "gold" theme used in the Arkansas program. This all worked out quite well, and although not planned, 'Goldnine' has been the most successful peach or nectarine to originate from the program.

### **Fresh Market Peaches**

'White River' was the first fresh-market, white-fleshed release from the program (2002). It ripens July 20 and has large fruit size with up to 14.5% soluble solids. Flavor is standard acid. It is nearly immune to bacterial spot and among the healthiest trees in the program. 'White River' softens when fully ripe as with other melting-flesh types.

The year 2004 brought the release of the first low-acid cultivars, 'White Rock' and 'White County'. 'White Rock' was released due to its early ripening (June 25) and the hope is that this cultivar offers to local growers, and potentially shippers, a unique fruit. Its flavor is light, sometimes described as "melon-like. The flavor of 'White Rock' is quite polarizing – some consider the flavor great, others believe not strong enough in white peach character. Thinning must be handled carefully with 'White Rock' to attain good fruit size. Also, for completely unknown reasons, it is the only peach genotype in the program that is attacked by squirrels. 'White Rock' appears to have two sources of firmness, one the processing cling type, and the other a unique type introduced in the program in the 1980s. These sources appear to be possibly additive, providing for an exceptionally firm fruit that does not soften until fully ripe, if even then.

Individuals that sample cultivars and selections in the Arkansas program often express that 'White County' is the most outstanding peach released. It is low acid with very firm texture. It can be consumed readily at the crisp stage, and the flavor comes through very well when not fully "ripe". When 'White County' does fully ripen it softens much like a melting flesh peach. It ripens July 14 and has large fruit. It has 80% overcolor and is very attractive.

### **Nectarines**

Three nectarines have come from the program, one melting flesh and two non-melting. The very early (June 12) ripening 'Westbrook' was released as a local-market nectarine with very good flavor. It lacks firmness for shipping, and is intended only for limited sales to attract customers for the early season. 'Westbrook' is among the most bacterial spot resistant genotypes in the program.

'Arrington' and 'Bradley' nectarines both have non-melting flesh. 'Arrington' ripens June 21 and has a nice nectarine flavor coupled with the non-melting flesh from processing peaches. Fruit size is medium, with a distinct orange ground color. 'Bradley' is large-fruited, and ripens July 4. Flavor is a processing peach/nectarine mix. Both of the non-melting nectarines hang well on the tree and allow for ripe fruits to be harvested and handled.

## **What's Coming?**

As of 2008, none of the white, non-melting, white-fleshed peaches developed in the program have been released. One, A-499, is on target to be released as it is the best of the standard-acid, white cling peaches with processing peach texture and firmness. Selection A-499 ripens in early July, and has large fruit with very firm texture along with excellent flavor. The tree is almost immune to bacterial spot.

Selection A-700 offers another low acid option that ripens in early August. It has fruit quality much like 'White County' and is judged outstanding in character by most evaluators. It is hoped that trees of these genotypes will be on the market in the winter of 2009-10.

The work in low acids continues, and low-acid, very firm white types are in advanced stages of testing including nectarines. Likewise, low acid, yellow-fleshed types are in evaluation. There is a limited amount of work on flat or saucer-shaped peaches and nectarines, incorporating all these traits – firm, low acid, very sweet. Again, these different fruit types are being developed to allow expanded options for growers beyond standard yellow, melting-flesh peaches.

Peach and nectarine breeding is an interesting paradox. On one hand, there is no other crop category that I work with (and I work with several crops; berries, grapes) that is as enjoyable to eat and rejoice in as peaches and nectarines. But, challenges abound in improving several important traits and in finding a market and use for developments.

To attain Arkansas peach and nectarine cultivars, contact:

Cumberland Valley Nurseries, Inc.  
PO Box 471  
McMinnville, TN 37111-0471  
800-492-0022

If other nurseries are interested in Arkansas peaches and nectarines, propagation agreements are available. New propagators are welcome to join the program.

# PEACH TREE DECLINE – CAUSES AND REMEDIES

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A peach orchard represents a tremendous investment and the grower. There are few experiences more frustrating than seeing the decline of an orchard before its prime. In my role as a peach specialist for Michigan State University I have worked with many growers to uncover and understand the causes for premature tree decline on their farms. Often the diagnosis is difficult because several factors have conspired to weaken their trees. The objective of this presentation is to summarize key factors responsible for peach tree decline under Michigan conditions and provide strategies for avoiding and correcting these factors.

## **Nursery tree condition:**

Like other stone fruit, the condition of the peach nursery tree at the time of planting varies is particularly critical. A newly planted stone fruit tree is less forgiving than an apple or pear and will never grow properly if it is poor quality at the time of planting. A high quality large caliper peach tree will fill the orchard row more quickly, but is also more likely to have problems than a smaller caliper tree if of poor quality. If you have confidence that you will receive trees in excellent shape and that they will be planted properly, then a larger caliper tree can be a better choice.

## **Soil conditions:**

Of all the tree fruit grown in Michigan, the peach does the best on sandy ground. The peach tree has the ability to scavenge water effectively from the soil profile. Peach will have problems on sites having shallow topsoil and sites where water drainage is less than optimum. The use of a berm is helpful in sites with heavier and/or poorer drained soils. Do not use berms in sandy sites to avoid drought stress problems. On intermediate sites, growers using berms should be prepared to provide temporary or permanent irrigation as needed, especially in the first two years of orchard growth.

## **Rootstock:**

Most commercial peaches in Michigan have Bailey and Lovell rootstock. Less frequently used rootstocks include various Tennessee Natural strains and, Halford. All these are fairly similar in cold hardiness and ability to tolerate poorer soils. Of these, Lovell and Tennessee Natural have greater vigor and may be a better choice for soil and scion combinations with lower vigor. The relatively new rootstock Guardian from the USDA Georgia breeding program has relatively good vigor under Michigan conditions, however, the cold tolerance of the rootstock has not been thoroughly tested under northern growing conditions. Since Guardian was derived from Nemaguard, a rootstock that shows poor hardiness, the cold tolerance of Guardian may be prove to be insufficient.

### **Peach tree borers**

The lesser peach tree borer and the peach tree borer can be a significant peach decline problem in the Michigan climate. Both burrow through bark and cambium tissue, leaving distinctive sawdust-like excrement and stimulating the tree to exude gum. The lesser borer is more common in scaffold and limb joints and cracks, whereas the peach tree borer is found at the trunk close to the soil line. The problem is relatively easy to diagnosis, especially if the larvae can be found. Annual trunk drenches with borer-specific insecticides such as Lorsban helps to protect against borer damage. Pheromone disruption of borers is an efficient strategy for many growers.

### **Leucostoma canker tolerance:**

Leucostoma (Cytospora) canker is a major cause of tree decline under Michigan growing conditions. Low temperature events such as that occurring in 1994 with lows -17F or below cause direct tree death due to damage to sensitive cambium tissue and indirect problems by increasing tree susceptibility to canker. These low temperature events reveal varieties and rootstock that are not adapted to Michigan conditions. Fayette and Suncrest are example of peach varieties with poor resistance to Leucostoma canker under Michigan conditions.

Cultural practices can affect susceptibility to canker. Greater use of summer pruning instead of delayed dormant pruning can reduce orchard vigor and subsequently increase susceptibility to Leucostoma canker. As shown by research by Alan Biggs, there is a race between wound healing and pathogen entry that follows pruning and factors that lower vigor can tip the balance in favor of the pathogen. Orchards with low vigor, meaning averaging less than approximately 1.5 feet of new growth each season, should be studied carefully to see what deficiencies in the cultural program need to be corrected

### **X-disease**

Peach X-disease is a frequent although irregular problem in Michigan peach and cherry orchards. This leafhopper transmitted phytoplasma disease can reduce a productive tree to a worthless condition in 2 to years. No practical treatment will save a tree infected with X-disease. Diagnosis of X-disease on peach is relatively easy due to the distinctive brown to wine-red blotches on leaves, and the retention of leaves on branch ends giving a "poodle-tail" appearance. Infected cherry trees and chokecherry bushes are the reservoir of the pathogen for infecting leafhoppers which in turn infect new trees. Prompt removal of chokecherries and infected cherry trees within 300 meters of a peach orchard will help to inhibit infections. However, since leafhoppers infected with X-disease retain the pathogen for life, long distance by leafhoppers is possible. Another source of infection is from root grafting of adjacent trees.