and committees in Washington DC where the urgent local funding needs are and the degree of financing needed (6). This could be done by switching the federal competitive grants and other monies to the federal Hatch, McIntire/Stennis and Smith/Lever type funding already in place. Perhaps the old federal Adams Act (discontinued in the 1950s with the competitive grants system) should be reinstated for specific funding of basic and long-term research as needed in plant and livestock breeding, genetics and nutrition.

An experienced agriculturally trained and oriented committee is badly needed in Florida and nationally to carefully evaluate the present agricultural funding and to make recommendations and carry them through for a more efficient and productive use of appropriated state, federal and private industry monies. The only way these recommendations can be carried through is to work with leading industry people and members of the state and federal congressional agricultural committees.

References


LOW-CHILL PEACH AND NECTARINE CULTIVARS
FOR TRIAL IN FLORIDA

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Additional index words. dormancy, cultivar evaluation, breeding.

Abstract. Twenty-five peach and nectarine, (Prunus persica (L.) Batsch) cultivars have been released over the last 35 years from the University of Florida breeding program. Fourteen additional Florida clonal selections have been given names in other countries. Cultivars such as 'Flordaprince', 'Flordagold' and 'Flordaking' peaches and 'Sungem' nectarine are being grown commercially in Florida. The new peach cultivars, 'Flordaestar', 'Flordaglo', 'Flordacrest', 'TropicBeauty', 'TropicSweet', and 'TropicSnow' are available for tests. Limited trials at University of Florida experiment stations in Lake Alfred, Gainesville, and Monticello and in grower cooperation orchards throughout the central and northern regions of Florida show high potential for successful commercial production from late April through early June, but efficient pest control and cultural management are essential.

Florida has good potential for peach and nectarine production because of suitable, well-drained soils, a dry period during fruit ripening, and an excellent market for fresh fruit during the early spring. The major impediment toward production has been lack of cultivars with adaptation in chilling. Traditional temperate zone peach and nectarine cultivars are not adapted and cannot be grown successfully in mild climates like Florida. Lack of adequate winter cold was documented as the limiting factor in peach growing in southern California as early as 1926 (2). Hutchins (3) suggested in 1932 that hours below 45°F (7.2°C) could be used in calculating cold requirements to match cultivars with location to induce normal flowering and leafing in spring. Later it was suggested that the mean January temperature be used to match area climate with peach cultivar adaptability (4, 9). Florida does not have locations with climates to match high-chill cultivars. A breeding program was initiated in the early 1950's to produce early ripening, low-chill, high fruit quality cultivars for adaptability in the climates of central and north Florida (7, 8). There has been a high degree of success in producing new cultivars that ripen from late April to early June. Hence, the promising cultivars for commercial production in Florida need to be reviewed.

Currently, 17 peach and 8 nectarine cultivars have been named and released by IFAS, University of Florida (4 jointly with the Texas Agricultural Experiment Stations and 1 jointly with the USDA), and 11 peach and 3 nectarine clones have been tested and named in other countries. The Florida breeding program is ongoing with rapid progress. It is known internationally with researchers from many countries visiting regularly to seek new budwood and information. Commercial production now occurs in 16 countries as a result of this cooperative effort. Older obsolete Florida cultivars for the US markets are being replaced, and gaps in ripening sequence are being filled. Low and moderate chill cultivars recommended for grower trial in Florida are presented in Tables 1 and 2 along with several advanced numbered clonal selections. Partial lists

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Table 1. Flower, leaf, and tree characteristics of low-chill peach and nectarine cultivars recommended for commercial trial in Florida.

<table>
<thead>
<tr>
<th>Cultivar</th>
<th>Selection No.</th>
<th>Observation (years)</th>
<th>Estimated chill units</th>
<th>January mean temperature (°F / °C)</th>
<th>Flower type</th>
<th>Bacterial spot resistance</th>
<th>Flower bud set</th>
<th>Leaf glands</th>
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Nectarine

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<th>Estimated chill units</th>
<th>January mean temperature (°F / °C)</th>
<th>Flower type</th>
<th>Bacterial spot resistance</th>
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</table>

\(^v\)Adapted from Weinburger (9) and Sharpe (4). Areas with this Jan. mean temperature or a lower one will provide sufficient chilling to grow this peach successfully.

\(^s\)S = slowy, NS = non-showy

\(^*\)1 = least resistant to 10 = most resistant

\(^!\)1 = 10% flower bud set to 10 = 100% flower bud set

\(^R\)R = reniform, G = globose

Table 1 contains information about the tree, flower, and leaf characteristics of each clone. Bacterial spot, Xanthomonas campestris pv. pruni (Sm.) Young et al., resistance refers to leaf resistance as the disease does not consistently appear on the fruit under Florida's climatic conditions. A high degree of flower bud set is important because spring frosts often will kill a percentage of flowers. Thus, high flower bud set increases the chances of full crops. Flower type and leaf glands at the base of the petiole are consistent with clone and are useful for identification of clones.

Relative chilling requirements of clones presented in Table 1 were estimated as chill units (cu) for normal foliation (flowering and leafing) based on the standard cultivars of 'Okinawa' (150), 'Sunred' (250), 'Early Amber' (350), 'Sunlite' (450), and 'Sungold' (550). Comparing foliation dates of new selections with these "key" established cultivars gives estimates of their cu requirements. The cu estimates are arbitrary, but the order of bloom dates should remain in relative order, with the lower cu clones blooming first in all Florida locations. Estimated cu for each clone are related to mean January temperatures (4, 9) for each area so that adapted clones may be chosen at each location for grower test.

Table 1 contains information about the tree, flower, and leaf characteristics of each clone. Bacterial spot, Xanthomonas campestris pv. pruni (Sm.) Young et al., resistance refers to leaf resistance as the disease does not consistently appear on the fruit under Florida's climatic conditions. A high degree of flower bud set is important because spring frosts often will kill a percentage of flowers. Thus, high flower bud set increases the chances of full crops. Flower type and leaf glands at the base of the petiole are consistent with clone and are useful for identification of clones.

Table 2 contains information about the fruit of each clone. Days from full bloom to maturity, known as the fruit development period (FDP), will vary with accumulated temperature during the FDP. Thus, early ripening, a function of earliness of bloom and a short FDP, was determined as an average at Gainesville for the number of years observed. Fruit size is a function of genetic potential, crop load, cultural management, and soil type. Large fruit are more difficult to breed on progressively shorter FDP cultivars. Fruit size can be increased best by adequate thinning, firm fruit and was representative of that desired
Peach and nectarine cultivars and clonal selections recommended for grower trial are presented with the best and worst characteristics as noted. Comparisons can be made in Tables 1 and 2. A * denotes a Florida selection named in another country.

Peaches

Flordabelle - improved version (Newbelle) has bright yellow ground color.
Flordacrest - similar to Flordaking but ripening 1 week after with more yellow ground color and few split pits.
Flordaking - large size for an early peach, many split pits if crop load is not high, fruit are pointed if chilling is inadequate.
Flordagem (7-1*) - attractive yellow ground color, firm, short fuzz, suture bulge may occur in some seasons, similar to Flordagold but ripens 1 week earlier.
Flordagold - the standard for firmness, size and attractiveness in its season, high flower bud set, susceptible to bacterial spot, rough shape with inadequate chilling.
FlordaGrande - lowest chilling requirement, not precocious.
Flordaprince - the standard for early ripening, susceptible to bacterial spot
Flordastar - early ripening, replaces Flordaprince in areas where bacterial spot is a problem.
Hermosillo (81-30*) - largest fruit, red overcolor tends to be purple-red, late season
Rayon (1-11*) - high quality, large size, freestone, needs more firmness
TropicBeauty - very attractive in color, excellent shape and very firm, very susceptible to bacterial spot
TropicSnow - large, firm, white flesh, non-browning, first freestone, light red overcolor, suture bulge most seasons
TropicSweet - very sweet with sugar speckles on the fruit giving dull appearance, moderately susceptible to bacterial spot

Fla. 9-1 - small, low-chill but has potential because it is the first to ripen
Fla. M2-2 - about 5 days before Flordaking, for north Florida
Fla. M3-8 - ripens 0-5 days before JuneGold with larger fruit, for north Florida
Fla. M2-5 - ripens 10 days before JuneGold with larger fruit, for north Florida
Fla. 82-21 - moderate-chill but has potential because of early season and attractiveness

Nectarines
Sunred - obsolete for shipping only because of small size, high quality, useful for roadside markets
Sunripe - high quality but subject to dull red overcolor related to sugar speckles
Sungem - first nectarine to ripen in north Florida, high flower bud set
Sunlite - late season, medium size fruit, for north Florida, high flower bud set
Sunfre - late season, large size, for north Florida
Fla. 9-6N - early season for central Florida, high red overcolor makes for difficulty in determining proper time of harvest
Fla. 9-11N - moderately early season for central Florida, high red overcolor
Fla. 9-15N - midseason for central Florida, replaces Sunred
Fla. 81-17N - early season for central Florida, small size
Fla. 81-24N - late season for central Florida, freestone, attractive fruit
Fla. 82-23N - late season for central Florida, freestone, high red overcolor
Fla. M2-4N - ripens about 5 to 7 days before Sungem with larger fruit, for north Florida
Fla. M3-1N - moderate chill, ripening before Sungem in north Florida
Fla. M2-7N - attractive fruit, larger fruit than Sungem and 5 days before JuneGold in north Florida

The following Florida bred peach and nectarine cultivars are not recommended for grower trial in Florida and are not included in Tables 1 and 2. Undesirable characteristics are noted for each cultivar. A * denotes a Florida selection named in another country.

**Peaches**
Desertred (7-11*) - highly susceptible to bacterial spot, high percentage of fused (twin) fruit
Flordabeauty (26-31*) - has green ground color
Flordahome - named for ornamental, multipetal flowers and has soft, white-flesh fruit
Flordakeen - lacks red overcolor, size, and firmness
Flordared - lacks firmness and red overcolor
Flordasun - lacks red overcolor, flavor, and size
Flordawn - lacks size, red overcolor, and firmness at tip
Maravilha (13-72*) - lacks size and firmness at tip
McRed (L8-112*) - lacks firmness, may have suture bulge and tip some years
Opodepe (1-3*) - lacks firmness and red overcolor
San Pedro (16-33*) - lacks firmness and red overcolor
Shermans Early (3-1*) - lacks size and red overcolor
Shermans Red (2-2*) - lacks size

**Nectarines**
Columbia (19-37*) - lacks firmness
KayGold (5-107N) - subject to fruit cracking
Sundowner (6-3N*) - thin skin, subject to skin cracking
Sungold - ripens too late for commercial shipping
Sunhome - named for ornamental red foliage and intended for dooryard fruit
Sunrich - ripens too late for commercial shipping

**Literature Cited**