small seeds similar in size to figs or strawberries are preferred. There exists a great deal of genetic variation for seed size in blackberries and much attention is given to this character in choosing breeding parents and selections. One promising cross, 'Whitford Thornless' X 'Flordagrand', has produced seedlings with numerous, high quality, small-seeded fruit.

FUTURE OUTLOOK

The bramble program in Florida has been unique in that adapted cultivars have been developed mainly for fresh fruit outlets. The newer cultivars have large, attractive fruit that ripen in April and early May, a time when few fresh fruits are available in major market centers. Blackberries have a short shelf life, therefore, these fruits have had greatest success in customer-pick operations and local markets. Characteristics not favorable for processing the present Florida cultivars including trellising, low soluble solids (9-10%) and low yields 1-2 T/acre.

For blackberries to become a major crop in Florida, superior cultivars with higher soluble solids and larger yields must be developed through breeding. Desirable characters such as large, firm fruit with small seed, thornlessness, uprightness and disease resistance can be introduced into selections and recombined until new selections are worthy of being named.

Selections of Rubus adapted to growing and fruiting under the climatic conditions of Florida should be tested in sub-tropical areas at 1200 to 1800 m elevation. The only known blackberry cultivation in the sub-tropics is that of R. glaucus at somewhat higher elevation (1).

SUMMARY

Seventeen years of Rubus breeding in Florida have resulted in two trellising varieties of very low winter-chilling requirements suitable for local markets. Genes for thornlessness, uprightness, higher fruit quality and smaller seed have been introduced into the germplasm at the diploid level. Additional breeding for higher soluble solids, larger yields and adaptation to mechanical harvesting will be necessary to make low-chilling requirement varieties competitive with established producing areas in the United States.

The breeding lines and varieties developed in Florida may be worthy of trial in other sub-tropical areas at suggested elevations of 1200 to 1800 m.

Fifteen or more years are normally required from the initial successful cross to establish the first commercial plantings of a previously static crop. The practical application of genetical tools has produced results rather quickly in adapting the brambles to a subtropical climate.

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BREEDING GRAPE FOR CENTRAL FLORIDA

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The most successful grape growing areas of the world are those in which little rain falls during the ripening period of the fruit. Abundant rains during this period promote disease, cracking and rotting of berries, and watery grapes of inferior quality (39). In Florida the time of ripening for grapes is June to September, which is also the time of most frequent rainfall. Since Vitis vinifera L. is highly susceptible to the diseases that accompany summer rainfall, new disease-resistant cultivars are needed with fruiting characters competitive with V. vinifera. Sources of such resistance in Vitis are found in both subgenus: Muscadinea (muscadine type) and Euvitis (bunch type) (1).

Three categories will be considered in the breeding of grapes: Euvitis breeding, Muscadinea breeding, and Euvitis x Muscadinea breeding. The purpose of this paper is to discuss each as they apply to developing new varieties for central Florida.

HISTORY OF RESEARCH

Euvitis breeding

The cultivation and selection of seedlings has been practiced for many centuries in the species Vitis vinifera L. This has produced a highly variable species with which to breed, including many cultivars of high fruit quality. V. vinifera was first introduced into Florida by early Spanish settlers, and many cultivars have been tried since that time. None of them survived long enough to be profitable here because of their susceptibility to diseases (41).

V. labrusca L. cultivars from northern states were later grown in Florida extensively, but longevity and disease resistance were lacking. Greater longevity was obtained from T. V. Munson's hybrids of V. labrusca x Triumph', and as many as 5,000 acres were planted in the 1920's in central Florida (36, 49). Vaile (50) reported 41 of Munson's hybrids in Arkansas, but only 2 could withstand shipment to distant markets: 'Carman' and 'Extra'. The same 2 cultivars were satisfactory market grapes for many years in Florida (49). However, even Munson's hybrids eventually became weak and unproductive from a disease later found to be largely caused by Pierce's disease virus (9, 45, 46).

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Muscardinia breeding

The Vitis subgenus Muscardinia is distinguished from subgenus Euvitis in having closely adherent bark, continuous pith through the nodes, unforked tendrils, and generally greater resistance to diseases, phytophthora, and nematodes than Euvitis cultivars. Three species are described in the literature: V. rotundifolia Michx., native to the Southeast, V. munsoniana Simp. native to central and south Florida, and V. popenoei Fenn. (21) from Mexico.

Older cultivars of muscadine originated as female selections of V. rotundifolia from the wild. In 1907, the USDA made a cross in a commercial Florida vineyard that gave rise to the first recorded self-fertile muscadine seedling, V. rotundifolia cv. ‘Eden’ was crossed with a native Florida male selection of V. munsoniana, and the seedlings were grown in North Carolina (10). ‘Tarheel’, one of the outstanding self-fertile cultivars used in breeding for larger clusters, was a derivative of this early rotundifolia-munsoniana hybrid (32, 52).

Conducting an active breeding program for improvement of muscadines since 1909, the Georgia Agr. Expt. Sta. has released a number of superior cultivars adapted to central Florida. Fy (25) used gamma irradiation to double the chromosome number of V. rotundifolia cultivars, obtaining increases in berry size. Phenomenal increases in berry size were obtained at the diploid level by using ‘White Male’, a diploid non-bearing V. rotundifolia selection, in the parentage (27).

Loomis bred muscadines between 1941 and 1965 at the U. S. Horticultural Field Station, Meridian, Mississippi. Two of the most outstanding self-fertile varieties in central Florida originated from his work: ‘Southland’ and ‘Magoon’ (31).

Beginning with early work of Reimer and Detjen (40), the North Carolina Exp. Sta. has conducted breeding and research with V. rotundifolia. In the past 25 years, new self-fertile cultivars have been released, and some have performed well in trials at the Watermelon and Grape Investigations Laboratory (2, 52).

With superior cultivars of Muscardinia introduced to Florida from other states, the emphasis of Florida work has been to test these for vigor, yield, suitability for mechanical harvest, quality, disease resistance, and processing potential (2, 5).

Euvitis x Muscardinia breeding

The 2 subgenera of Vitis differ morphologically, in specific gravity of the wood (51), and in chromosome number: 38 in Euvitis and 40 in Muscardinia (43). The disease susceptibility of most Euvitis cultivars in a humid, subtropical environment stands in sharp contrast to the resistance of Muscardinia in the same environment. However, crossing the 2 subgenera has led to sterility problems, and the history, begun over 15 years ago, has been reviewed (38). The hybrids had 39 chromosomes (19 Euvitis and 20 Muscardinia), and were almost completely sterile due to abnormal pairing and irregular distribution of chromosomes (38). This supports Bailey’s classification of Muscardinia as a separate subgenus from Euvitis (1). Patel and Olmo were not able to obtain fertilization when V. rotundifolia was used as the female parent, even though V. vinifera pollen tubes grew down the style and sometimes into the microstyle of the muscadine pistils. The reciprocal cross was readily made, but the backcross progeny of the hybrids lacked vigor (38).

Dermen (12) restored fertility to sterile Euvitis x Muscardinia F1 hybrids by doubling the chromosome number with colchicine. He obtained segregation of characters from both species by intercrossing the doubled F1 hybrids at the 4x level (13). Crossing 4x Euvitis female with 4x Muscardinia male was successful, but not the reciprocal (4).

Two diploid hybrids (2n=39) of historical interest originated in North Carolina about 1916. One was N.C. 6-15, a cross between an open-pollinated ‘Malaga’ seedling (V. vinifera) and an hermaphrodite V. rotundifolia (15). The other was a cross of a V. rotundifolia female with ‘Black Morocco’ (V. vinifera), known as N. C. B4-50 (10). Both hybrids were largely sterile and unprofitable, but during the 1950’s Dermen (6) obtained an viable seed from N.C. 6-15 by applying abundant pollen from several Euvitis cultivars on the open-pollinated flower clusters. The majority of his seedlings were weak, but some (2n=38) showed marked heterosis and normal ovule fertility. He made further backcrosses of one of these fertile seedlings to both Euvitis and Muscardinia, obtaining fruitful progeny with segregation of genes at the diploid level (17, 18). The other hybrid, N.C. B4-50, was the grandparent (through open-pollinations) to many 30, which produced fertile triploid seedings when Fy (26) crossed it with Muscardinia female cultivars.

In contrast to the earlier report of sterility (38), several recent F1 hybrids involving different cultivars of V. vinifera as the maternal parent were partially fertile (28). There was a correlation between chromosomal pairing and fertility of the hybrid. Diploid backcrosses of the F1 hybrids to V. vinifera ranged from completely sterile seedlings to others as fertile as standard varieties. Segregation for V. rotundifolia characters, such as flavor, type of bark, diaphragm, and size of flower clusters was observed in the backcross progeny (29).

PRESENT PROGRAM

Euvitis breeding

The following Euvitis species are native to Florida: V. cordifolia Michx., V. gigas, V. rafotomentosa, V. shuttleworthii, V. simpsoni, and V. smalliana. Better selections from the last 3 species were the sources of disease resistance used to combine with the desired fruit characters found in V. vinifera and V. labrusca cultivars. Since the chromosome number is 38 for all the above species, little difficulty has been encountered in crossing them and obtaining fertile progeny.

Since the F1 hybrids from V. vinifera as the maternal parent, better selections are backcrossed to the cultivar with desirable fruit. Where a V. vinifera cultivar is the recurrent parent there is a high degree of susceptibility to anthracnose, downy mildew, and Pierce’s disease among the progeny. For this reason the double cross, or intercross of selected F1 hybrids, is often used to maintain disease resistance in the progeny and still obtain segregants with recessive fruit traits such as firm texture and large cluster size. Outstanding segregants that complement each other in desirable traits are frequently intercrossed, especially if their original sources of disease resistance stem from different native species.
In considering the overall strategy of the breeding program it seemed desirable to determine which crosses have produced the highest percentage of outstanding selections. The 20 outstanding crosses between 1945 and 1965 are given in Table 1. At first glance, it might seem desirable to repeat these 20 crosses with larger populations in order to be reasonably sure of obtaining outstanding progeny. However, the breeding objectives at the present time are more advanced and more difficult to attain than they were at the start of the breeding program in 1945.

The objectives for the breeding program are as follows: (a) vigorous, high-quality, long-lived vines, with resistance to diseases of vine and fruit, especially Pierce's disease, anthracnose, black rot, ripe rot, bitter rot, and downy mildew; (b) self-fertile flowers; (c) productivity and adaptability to mechanical harvest; (d) uniformly ripening berries on large clusters that hold well on shelf or in cold storage without pedicel drying or shelling.

Table cultivars should ripen in June, before California grapes are available in sufficient quantities to depress market prices. Seedlessness, crisp texture, attractive appearance, and good eating quality are other desired objectives.

Juice cultivars should have a color and flavor resembling 'Concord' - the processed product. Several varieties that ripen in June, July, and August are desired so that commercial citrus juicing facilities, which are relatively idle at that period of the year, can process grapes during a prolonged harvest season.

None of the 20 crosses in Table 1, even if repeated in larger populations, would yield progenies that produce early, seedless, textured fruit. For early, firm-textured table types with seeds, the following could be repeated: W1521 x 'Perlette', W1521 x 'Alden', C5-49 x 'Exotic', and B3-90 x 'Exotic'. For early, slipkin types: 'Norris' x 'Schuyler' and 'Norris' x 'Alden'. For juice or table types, slipkin types resembling 'Concord', the 'Blue Lake' x 'Concord' and 'Norris x Concord' could be repeated. Intercrosses involving 'Concord' as grandparent on both sides show considerable promise in juice types. For seedless, firm-textured types, new combinations are being explored using seedless male parents crossed with seeded female parents, the latter having seedless parentage.

A replicated yield test consisting of 6 newer selections (none seedless) is under way at 3 locations in Florida (Table 2). Seedless selections to date are too small in berry size to merit trial.

Muscadinia breeding

For satisfactory commercial production in Florida we need muscadines resistant to Pierce's disease and several fungus diseases. Certain newer cultivars, though improved in self-fertility, berry size, or quality, have greater susceptibility than older ones to specific diseases. Improved resistance to drought and greater vigor during years of establishment is needed in Florida's well-drained, sandy soils. High labor costs in harvesting demand that newer varieties be suitable for mechanical harvest. Some cultivars take readily with dry stem scars on the berries, while others are too tenacious when shaken, tearing the berries.

Sixty muscadine entries now under trial at the Watermelon and Grape Investigations Laboratory include 24 named cultivars, 6 USDA selections, 9 Ga. Expt. Sta. selections, 18 N.C. Expt. Sta. selections, and 3 V. mussoniana selections. Several of these can be recommended for Florida growers (2).

With active breeding programs elsewhere in the Southeast, relatively few crosses among Muscadina are being made in Florida. Zehnder, a private breeder in South Carolina, saved open pollinated seeds from Fennell's 3-way hybrid [(V. rotundifolia x V. musx) x V. popenoei], and the seedlings grown in Florida had highly flavored fruit on vigorous vines. V. mussoniana cv. 'Marsh', selected from the wild in Central Florida because of its uniform cropping and early bud burst, has been extremely healthy and vigorous. Crosses were made to outstanding self-fertile cultivars of V. rotundifolia in order to improve berry size, quality, self-fertility, and suitability for mechanical harvest.

Euwits x Muscadinia breeding

Most Euwits x Muscadinia hybrids tested in central Florida are not long-lived, primarily due to susceptibility to Pierce's disease. A notable exception is Dunstan's V. rotundifolia backcross hybrid DRX 64-69. It is resistant to Pierce's disease and anthracnose, traits derived from the muscadine parent (Ga. 14-20), and it crosses readily with either Euwits or Muscadinia. A number of Euwits cultivars have been crossed with it to incorporate the muscadine-type resistance into the progeny.

Recent tests for resistance to Pierce's disease in 15 Euwits backcrosses [(Euwits x Muscadinia) x Euwits x Euwits] were conducted at Leesburg in cooperation with the Cal. Agr. Expt. Sta. While most were susceptible, 2 selections (Cal. e2-82 and Cal. e5-17) appeared resistant. If so, this is another example of transfer of resistance to Pierce's disease from Muscadinia to Euwits type progeny. Euwits 7-2, an intercross between 2 Euwits backcrosses, was vigorous and resistant to Pierce's disease, though highly susceptible to anthracnose. In this instance it is not clear whether the resistance came from the V. rotundifolia parent of N.C. 6-15 or from Euwits male V. cinerea Englom.

FUTURE OUTLOOK

The future expansion of a grape industry in Florida depends on the development of new cultivars adaptable to mechanical harvest. Combining the desirable traits of earliness, seedlessness, firm texture, and disease resistance requires carefully planned crosses and, ideally, large populations.

The most rapid success in developing new cultivars will likely come from breeding at the diploid level within the separate subgenus Euwits and Muscadinia. The recombination of the best traits of bunch grapes with those of muscadines is more long range. Based on his backcross progenies at North Carolina and those of Dunstan and Olmo, Nesbitt (personal correspondence, 1970) believes that the use of intersubgeneric hybrids and their backcross progenies at the diploid level has much potential for transferring specific genetic traits from one subgenus to the other in Vitis. However, he found that breeding in such interspecific hybrids at the diploid level is less promising, and hexaploid hybrids were too weak to study further.

It appears that elimination of tough skin and pulp are more difficult in breeding Euwits x Muscadinia than in Euwits alone, especially if disease resistance is to be preserved. Dunstan (19) reported large blossom clusters in certain F1 progenies of Euwits x Muscadinia, suggesting that a broader base of species and varieties be used in both subgenera in order to exploit horticultural potential. The Muscadinia type of resistance to Pierce's disease may be of a higher

Table 1. The 20 best crosses made between 1945 and 1965, based on percentage of outstanding selections.

<table>
<thead>
<tr>
<th>Parentage of cross</th>
<th>Year made</th>
<th>Outstanding progeny selections</th>
<th>% of progeny selected</th>
</tr>
</thead>
<tbody>
<tr>
<td>W1521 x S.V. 12-375</td>
<td>1958</td>
<td>CS-48, CS-50</td>
<td>3 66.7</td>
</tr>
<tr>
<td>W1521 x Aurelia</td>
<td>1965</td>
<td>E18-63</td>
<td>4 25.0</td>
</tr>
<tr>
<td>W1001 x S.V. 12-375</td>
<td>1957</td>
<td>B3-83, B3-90</td>
<td>16 12.5</td>
</tr>
<tr>
<td>W1521 x Alden</td>
<td>1963</td>
<td>E8-48, G5, 70</td>
<td>27 11.1</td>
</tr>
<tr>
<td>W1521 x Perlette</td>
<td>1964</td>
<td>F10-18</td>
<td>9 11.1</td>
</tr>
<tr>
<td>C5-50 x Exotic</td>
<td>1964</td>
<td>F8-5, 8, 19, 27</td>
<td>28 10.7</td>
</tr>
<tr>
<td>W987 x Lake Emerald</td>
<td>1956</td>
<td>Norris</td>
<td>10 18.0</td>
</tr>
<tr>
<td>B3-90 x 'Lew开来</td>
<td>1964</td>
<td>F11-11</td>
<td>24 8.5</td>
</tr>
<tr>
<td>Norris x Alden</td>
<td>1964</td>
<td>F21-23, 35</td>
<td>37 8.1</td>
</tr>
<tr>
<td>Fla. 43-47 x Caco</td>
<td>1950</td>
<td>Blue Lake</td>
<td>14 7.1</td>
</tr>
<tr>
<td>Manley x S.V. 12-309</td>
<td>1956</td>
<td>Stover 17</td>
<td>5.9</td>
</tr>
<tr>
<td>C5-49 x Exotic</td>
<td>1964</td>
<td>F4-16, F4-65</td>
<td>37 5.4</td>
</tr>
<tr>
<td>Blue Lake x Concord</td>
<td>1961</td>
<td>D5-167</td>
<td>9 19.3</td>
</tr>
<tr>
<td>Pieliosxa x G. Muscat</td>
<td>1945</td>
<td>Lake Emerald</td>
<td>20 5.0</td>
</tr>
<tr>
<td>Norris x Stover</td>
<td>1963</td>
<td>E14-29</td>
<td>21 4.8</td>
</tr>
<tr>
<td>Norris x Schuyler</td>
<td>1961</td>
<td>D14-176, D5-108</td>
<td>10 4.6</td>
</tr>
<tr>
<td>Norris x Concord</td>
<td>1963</td>
<td>E11-40, E158, 71</td>
<td>23 4.3</td>
</tr>
<tr>
<td>Dunstan 210 x Manley</td>
<td>1963</td>
<td>E8-31</td>
<td>29 2.6</td>
</tr>
<tr>
<td>Fla. 43-47 x G. Muscat</td>
<td>1948</td>
<td>W716</td>
<td>56 1.7</td>
</tr>
<tr>
<td>Fla. 43-47 x Concord</td>
<td>1963</td>
<td>E12-59</td>
<td>59 1.7</td>
</tr>
</tbody>
</table>

Table 2. Characteristics of 6 new selections compared with 4 cultivars previously released.

<table>
<thead>
<tr>
<th>Selection no.</th>
<th>Date ripe</th>
<th>Color</th>
<th>Texture</th>
<th>% sugar</th>
</tr>
</thead>
<tbody>
<tr>
<td>D4-176</td>
<td>July 10</td>
<td>Purple</td>
<td>Slipskin</td>
<td>19.2</td>
</tr>
<tr>
<td>E8-52</td>
<td>July 20</td>
<td>Green</td>
<td>Slipskin</td>
<td>21.2</td>
</tr>
<tr>
<td>E11-40</td>
<td>July 12</td>
<td>Purple</td>
<td>Slipskin</td>
<td>19.2</td>
</tr>
<tr>
<td>E18-63</td>
<td>July 16</td>
<td>Golden</td>
<td>Slipskin</td>
<td>18.8</td>
</tr>
<tr>
<td>F4-16</td>
<td>July 18</td>
<td>Red</td>
<td>Firm</td>
<td>17.2</td>
</tr>
<tr>
<td>F4-36</td>
<td>July 8</td>
<td>Red</td>
<td>Firm</td>
<td>20.8</td>
</tr>
<tr>
<td>Lake Emerald</td>
<td>July 30</td>
<td>Green</td>
<td>Slipskin</td>
<td>20.5</td>
</tr>
<tr>
<td>Blue Lake</td>
<td>July 16</td>
<td>Purple</td>
<td>Slipskin</td>
<td>16.1</td>
</tr>
<tr>
<td>Norris</td>
<td>July 24</td>
<td>Purple</td>
<td>Slipskin</td>
<td>17.5</td>
</tr>
<tr>
<td>Stover</td>
<td>July 6</td>
<td>Golden</td>
<td>Slipskin</td>
<td>17.5</td>
</tr>
</tbody>
</table>
level than that from native Euwitis. Combination of both types of resistance should be attempted, as it may give rise to a more permanent type of resistance that is less subject to breakdown under an intensive grape culture in Florida. See Fig. 1-4.

Techniques for testing larger populations from crosses will be needed. Rapid screening tests for resistance to diseases, such as that reported by Barrett (4) for black rot, would be helpful. Many susceptible segregants could thus be eliminated prior to transplanting to the vineyard. As many as 82% of the seedlings in certain crosses may be susceptible to Pierce's disease, even though one parent is resistant (33). Many of them might be eliminated early by a screening test with viruliferous insect vectors or other means. The same might be accomplished for anthracnose resistance.

Shortening the time between generations is another worthwhile objective. The usual period from pollination until nursery seedlings are large enough for vineyard setting is 18 months. An additional 18 or 30 months in the field may be required before seedlings come into bearing. New techniques that take advantage of the long growing season and mild winters of Florida should be developed. The use of budding (44), partial shade, black polyethylene mulch, and liquid fertilizers may hasten the time from seed to fruit. Exchange of pollen among grape breeders, pollen storage (37), and timed grafting of pollen source (23) also may expedite the breeding program.

Better objective tests for measuring suitability for mechanical harvest, seedlessness, and size of cluster and berry should also be developed.

Obtaining grape cultivars adapted to humid subtropical climate, resistant to diseases, and of competitive quality and appearance is a challenging endeavor that has begun to bear fruit. The future should bring marked improvements in grape cultivars.

SUMMARY

Since requirement for winter chilling is not as critical in Vitis as in other deciduous fruits, the principal emphasis in breeding grapes for central Florida has been on the incorporation of disease resistance into commercially acceptable types of Euwitis. Florida native Euwitis species, especially V. simplicissimi, V. smallii, and V. shuttleworthii, have been superior to others as sources of disease resistance.

Early ripening, seedlessness, firm texture of fruits, and resistance to the diseases prevalent in Florida have been difficult to combine. Intercrossing selected F1's that complement each other in desirable traits, or that carry masked recessives of desired traits, has been better than backcrossing to pure V. vinifera in most cases.

Methods of expediting the breeding program, by growing larger populations, earlier screening for disease resistance, shortening the time between generations, and by free interchange of pollen and wood among breeders were discussed.

Recent Euwitis x Muscadinea backcross progenies of DRX 64-69 to Euwitis show promise of recovering Muscadinea levels of resistance to Pierce's disease and possibly to anthracnose in Euwitis cultivars. This source of resistance may supplement or be superior to that from native Euwitis in future progenies.

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BREEDING PEACHES FOR WARM CLIMATES

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The peach as an item of commerce has developed primarily in the temperate regions of the world, the equatorial boundaries being limited by minimum accumulated chilling temperatures and the polar boundaries by minimum winter temperatures. Native temperate climate peaches contain combinations of desirable characteristics with which suitable cultivars could be developed with relative ease. Among such characteristics large fruit size, suitable acid-sugar ratio and flesh firmness are particularly important in commercial varieties.

Peaches adapted to relatively mild winters in their wild state were distributed to various world areas just as were the types more suited to temperate climates (10). But, because the mild-winter peach types produced small, poorly shaped, soft fruit with a honey-sweet flavor, they have been unsuited for commercial production. During the last 2 decades interest in commercial peach cultivars for mild-winter areas has increased because fruit produced in these areas can be marketed before that produced in the temperate regions (Table 1. Also, interest in producing high-quality peaches is increasing in some countries that do not receive adequate accumulations of chilling temperatures to grow traditional temperate-region cultivars. Among areas having mild winters where peaches are grown include Brazil, Egypt, Hawaii, India, Paraguay, Venezuela, Columbia, Ecuador, Guatemala, South China, Argentina, Australia, Italy, South Africa, Mexico, and the United States (22). A number of programs have been established to combine low-chilling requirement with the desirable fruit and tree characteristics of the temperate-region cultivars.

Table 1. Comparative bloom and harvest dates of some Florida peach cultivars at Rialitos, Texas, a 400-hr chilling area.

<table>
<thead>
<tr>
<th>Cultivar</th>
<th>Avg 1st bloom date</th>
<th>Harvest date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Floridan</td>
<td>January 23-31</td>
<td>April 21-30</td>
</tr>
<tr>
<td>Sunred</td>
<td>January 23-31</td>
<td>May 1-7</td>
</tr>
<tr>
<td>Early Amber</td>
<td>February 5-10</td>
<td>May 10-20</td>
</tr>
</tbody>
</table>

HISTORY OF BREEDING AND PRESENT PROGRAMS

Two principle kinds of peaches, 'Honey' and 'Peen-to', have been used in breeding to obtain adaptability to mild winters, the former being far more extensively used as a breeding parent. Both types originated in South China. The 'Honey' peach was first introduced into the U.S. in 1850 as seed imported by Charles Downing of Augusta, Georgia. It is characterized by soft-melting, white flesh, a honey-sweet flavor, and oval fruit with a pronounced, recurved apex. The 'Peen-to' fruit is highly compressed in its longitudinal axis, being much shorter on this axis than on the transverse axis. Both are described in detail by Hedrick (10).