Peach Variety Adaptability to Southern Conditions

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THE importance of knowing the adaptability of peach varieties and their behavior under local conditions in planning a future orchard is well recognized. Fortunately some peach varieties are adapted to a wide range of conditions. The Elberta peach, for example, has been the leading variety in most important freestone peach growing areas for many years. It is perhaps significant that this variety was first evaluated under southern conditions.

In the South, there are many considerations not present elsewhere which affect the adaptability of varieties or affect them to a smaller degree elsewhere. To be successful, varieties of peaches for all sections must have consumer quality characteristics such as attractiveness of the fruit and at least fair eating quality. Under southern conditions, where the principal markets are hundreds of miles from the areas of production, varieties need extra firmness and superior shipping quality to withstand the extra handling and the delay until the fruit reaches the consumer. Slow-ripening varieties are needed, so that the fruit will remain attractive until the time of retail sale. Golden Jubilee was one of the leading varieties in South Carolina until a few years ago, but because of its lack of firmness and good shipping quality, its production is rapidly falling off in that state. Not having the population for heavy local market demand, the South relies mostly on varieties with firmness and good shipping quality, such as Elberta, Redhaven, Dixired, and Southland.

Disease susceptibility also is a factor in southern peach production. Some varieties like J. H. Hale have the necessary firmness and slow-ripening character, but because of susceptibility to brown rot they are not well suited for long-distance shipment when grown in the humid South. Bacterial spot is extremely serious in the Sandhills area and parts of Texas, moderately serious in other parts of the Coastal Plain, and occasionally serious in the Piedmont and lower South areas. In the important peach-producing area in the Piedmont of South Carolina it has caused relatively little trouble thus far. Varieties extremely susceptible to bacterial spot, like Sunhigh, are at a disadvantage in the varietal struggle for popularity. On the other hand, resistant varieties like Hiley and Belle are not able to prosper from their resistance alone. Good fruit characters are more important in a variety than disease resistance, and orchards of susceptible Sunhigh are found in the most heavily infected locations.

Root-knot nematodes are a problem affecting production particularly in the lighter soils of the South. None of the commercial varieties carry resistance to nematode attack, so their seedlings cannot be used for resistant stocks. Nematode resistant stocks are available commercially, though none are wholly resistant to all strains of root-knot nematode.

Climate plays an important part in the adaptability of a variety to southern conditions. Winter bud-hardiness, a factor of real concern to many north-

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ern peach growers, is of little consequence to southern growers except along the northern fringe of the region. Temperatures in the greater part of the South rarely sink low enough to damage fruit buds during the dormant period of winter. Spring frosts do serious crop damage in the South as elsewhere, except in the Fort Valley area in Georgia, which has a remarkable record of freedom from complete crop loss due to frost damage. Differences among varieties in resistance to spring frosts are not well established except perhaps in connection with their time of bloom. Some varieties, like Prairie Dawn, seem to set well following unfavorable weather conditions, perhaps because their blossoms are resistant to frost. Here again, fruit characters are of much greater importance in the popularity of a variety than a single favorable character, such as ease of fruit setting.

Climate plays the biggest part in determining the adaptability of a peach variety to southern conditions in winter chilling to break the rest period of peach buds. The amount of chilling weather, temperatures of 45 degrees F. or below, which normally occurs at a location, determines the southernmost limit for the planting of our important commercial varieties. Roughly these limits extent along a line from Columbia, South Carolina, through Augusta and Macon, Georgia, Montgomery, Alabama, Jackson, Mississippi, and Shreveport, Louisiana, to Tyler, Texas. U. S. Highway 80 from Macon, Georgia to Dallas, Texas, closely follows this line.

North of this route, winters are usually cold enough for the satisfactory production of Elberta peaches. More than 100 miles north of the route, prolonged dormancy trouble on all varieties of peaches is practically unknown. Approximately 100 miles south of this route, Elberta and other commercially important varieties suffer too frequently from prolonged dormancy trouble to be profitable and little attempt is made to grow peaches. It is in this belt about 200 miles wide that winter chilling causes most concern.

Peach varieties differ greatly in the amount of chilling required to break the rest period of their buds. Since most varieties are out of their rest period by February 15, after they have been exposed to a minimum amount of chilling, the chilling requirements of varieties in the Southeast have been expressed as the number of hours of temperatures of 45 degrees F. or below required to break the rest by February 15. The Mayflower variety has very high chilling requirements, 1150 hours for flower buds and 1250 hours for leaf buds. Elberta requires 850 hours for flower buds and 950 hours for leaf buds. All important commercial varieties require at least 750 hours by February 15 for normal development.

In the Southeast, varieties will usually set a good crop of fruit though their chilling requirements are 100 hours short of being satisfied, and though they suffer somewhat from prolonged dormancy. They will usually set only light crops if 200 hours short, as shown in Fig. 1, and generally have no fruit if 300 hours short. Recently it has been found that high temperatures during the winter, particularly in December, counteract chilling and markedly affect the behavior of leaf and flower buds the following spring.

Some varieties like Jewel and other derivatives of the Peento peach require only a few hundred hours of chilling and are grown in central Florida. Varieties like Robin, with intermediate chilling requirements, can be grown in cooler locations. Recently the Maygold variety, requiring only 650 hours of chilling, was introduced by the U.S. Department of Agriculture

Fig. 1. **An Elberta tree at Fort Valley, Georgia, suffering from prolonged dormancy. Photographed on May 4.**

to extend the commercial peach area to the South. Since parent material with the desired chilling requirements is available, it is only a matter of time until peach breeders develop varieties adapted to relatively warm winter areas. Too low a chilling requirement, resulting in early blossoming and greater frost hazard, is almost as undesirable in the critical area as too high a chilling requirement. In the critical area, each location needs varieties with chilling requirements just slightly lower than the normal accumulation for the particular location.

There are two other problems with peaches in the extreme South which are of less consequence elsewhere. One is the roughness in surface, pronounced tip, and exaggerated suture of fruit grown in this area. Varieties which are round and symmetrical when grown under northern conditions are frequently rough and misshapen in fringe production areas. Halehaven and Sunhigh are typical examples.

The other problem is high temperatures just preceding harvest, which affect the color of the fruit adversely. Late-ripening varieties that mature during the hot weather of July and August often have a dull, unattractive finish. The same varieties ripening in a cooler location have more attractive coloring. This effect of climate on the color of the fruit is more serious in the southern fringe production areas than elsewhere.

Climate and distance from market in the South have selective effects on the varieties of peaches planted. It happens that most of the peaches grown under southern conditions are of varieties which were found or developed there, but a few northern varieties have proved very successful.