Bulletin No. 250 October, 1956

VARIETY STUDIES OF

PEACHES

IN TENNESSEE

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THE UNIVERSITY OF TENNESSEE
KNOXVILLE

VARIETY STUDIES OF PEACHES IN TENNESSEE

Troy H. Jones
Associate Horticulturist

The author of this bulletin hereby gratefully acknowledges the assistance given by horticulturists and other members of the Agricultural Experiment Station staff and the Superintendents of the Highland Rim and the West Tennessee Stations in carrying on the investigations reported herein.

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TABLE OF CONTENTS

	Page
Introduction	5
Description of Varieties of Commercial Use	5
Varieties in Relation to Critical Temperatures	7
Discussion and Conclusions	9
Summary of Peach Variety Data (Table I)	10-11

VARIETY STUDIES OF PEACHES IN TENNESSEE

Introduction

The Department of Horticulture established a peach planting in 1945 at the Knoxville station to evaluate some of the varieties that had been developed by intensive breeding programs over the previous 10-20 years. A few years later a smaller test was started at the Highland Rim Station at Springfield. A variety peach orchard, composed of 11 varieties, was set at the West Tennessee station at Jackson as early as 1933. This report will draw upon data from all three of these sources.

An effort has been made to observe the significant features of all varieties, such as time of bloom, winter hardiness (bud and wood), age of tree for first crop, regularity of bearing, estimated yield, over-all tree vigor, susceptibility to common pests, stone condition, flesh texture, quality, and market and processing adaptability. As in any variety orchard in operation for several years, the trees vary in size, age and productivity, because there is a constant discarding of unadapted material, and replacement with new varieties. Yield records, therefore, were not tabulated. Instead, the crop of fruit, relative to the productive capacity of the tree, was estimated.

This report considers in detail only those varieties of commercial importance. Varieties are discussed in order of ripening. The table on pages 10 and 11 summarizes not only the commercial kinds but also varieties best suited for the local markets and those that are of doubtful value except under limited or specific environmental or market conditions.

Description of Varieties of Commercial Value

Dixired—an attractive, strongly colored, round medium-sized peach; a clingstone with light pubescence. The flesh is firm, yellow, and the quality is good for an early peach. It ships satisfactorily. Introduced from Fort Valley, Georgia. Halehaven selfed.

Erly-Red-Fre—white, large, rather attractively colored, semi-free, early, hardy peach of medium quality. A reliable producer with limited commercial value. A patented variety introduced by Bountiful Ridge Nursery.

Dixigem—medium sized, ovate, yellow, with light pubescence. The over-all color is not as bright as is desired. It is of high quality and excellent as a freezing and canning peach; flesh is of the non-browning type. Some years the stone has a tendency to cling slightly. It holds up satisfactorily in shipment. Dixigem was developed at Fort Valley, Georgia. (Dewey X St. John) X South Haven.

Redhaven—a variety that is now well known in Tennessee. It is highly colored, even in advance of maturity, very attractive,

flesh firm, yellow, excellent quality and superior for processing. It, too, has the non-browning characteristic. The skin is tough and the fruit ships well. The fruits tend to cling to the stone some seasons and must be heavily thinned in order to size properly. The trees are not as sturdy as desirable, but are rather resistant to bacterial leaf spot. Introduced from South Haven, Michigan. Halehaven X Kalhaven.

Golden Jubilee—the fruit is large with a very attractive orange-yellow ground color and reddish-blush over color. It is always freestone and ripens somewhat rapidly especially at high temperatures. Not exceptionally good as a shipper. The flesh is bright yellow, a little too soft for commercial canning, but still popular for home canning and freezing. Under Tennessee conditions the fruit usually tends to be somewhat flattened through the cheeks. The tree is vigorous and develops a good set of fruit buds annually. It was introduced from New Jersey. Elberta X Greensboro.

Triogem—an early midseason, oval, firm, highly colored, yellow, freestone variety. Fruits hang on the tree well after becoming firm ripe. Pubescence is short. It possesses excellent quality, is superior for processing, handles well in shipment and has good size, especially when properly thinned. The trees are productive. Considering the newness of the variety, it has been well received by growers and markets alike. Triogem was introduced by New Jersey. J. H. Hale X Marigold.

Fairhaven—a yellow, freestone, good flavored and productive peach. It is not as deeply colored as Redhaven or Halehaven, but is attractive. Fruits are medium in size when thinned, nearly round, with light pubescence and a tough skin. Introduced from South Haven, Michigan. J. H. Hale X South Haven.

Southland—a brightly colored, medium-to-large, round, yellow peach with light pubescence. It is freestone with high quality and sufficiently firm flesh to make it handle and process well. The variety was developed at Fort Valley, Georgia. Halehaven selfed.

Halehaven—a yellow, freestone, medium sized, productive peach. Although widely planted, it has probably reached its peak as a commercial variety. The red outside color is so deep in intensity that it actually gives a dull appearance. It is satisfactory for processing, but is not particularly good as a shipper. Introduced by the station at South Haven, Michigan. J. H. Hale X South Haven.

Burbank July Elberta—a yellow, freestone peach of medium-to-good quality, round, medium size. The tree is not as robust as one might prefer, but it withstood the winter of 1950-51 at Springfield in good shape. A patented variety introduced by Stark Brothers' Nursery.

Sunhigh—this is a large, highly colored, oval, firm, yellow fleshed, freestone peach. The fruits are very high in quality and good for canning and freezing. It also ships well. The tree is not extremely vigorous, and bacterial leaf spot is sometimes a trouble-

some disease. A New Jersey introduction. J. H. Hale X New Jersey No. 40.

Loring—the fruit is firm, yellow, productive, attractive, large and flavorful. It is relatively new to the variety list and is worthy of trial. An introduction from Mountain Grove, Missouri. Frank X Halehaven.

Sullivan Early Elberta—except for ripening a week earlier than regular Elberta, and except for being a trifle softer, it greatly resembles that famous variety in fruit characteristics. The tree is slightly more susceptible to bacterial leaf spot than Elberta. It is a bud sport of Elberta, from Georgia.

Belle of Georgia—the best known of the white freestone peaches. Medium in size, round-oval, tender skin, white flesh, tinged with some red, and very high quality. Not a good shipper. Chance seedling from Georgia.

Early Elberta (Gleason)—a peach with rich yellow ground color and a slight blush of red. It is freestone, yellow fleshed, large, oval and of good quality. Only fair as a shipper. Processes satisfactorily. A nursery introduction.

Elberta—still the leading commercial variety in Tennessee as well as the United States. This yellow, freestone, widely adapted peach is too well known to make a description necessary. The greatest disadvantage of this standard trademarked peach is its below-average quality. A chance seedling from Georgia.

Shipper's Late Red—a variety that is yellow, freestone, large, fairly attractive for a late peach. Quality and production are good. Trees are vigorous. There appear to be several strains of this fine variety.

Afterglow—a yellow fleshed, medium-to-large, freestone, firm textured, good quality peach. It is a desirable variety to follow Elberta. For a late peach, the over-all color is good. This is another New Jersey introduction. J. H. Hale X New Jersey No. 27116.

Varieties in Relation To Critical Temperatures

During the time the orchard was under test at Knoxville (1945-1954) there were no total crop failures from low winter temperatures or late spring frosts. Although threatening frosts occurred during and immediately after bloom on several different occasions, trees of bearing age generally came through with a crop. Varieties that bore commercial crops usually had to be thinned each year despite frost occurrence. From this standpoint there was little from which to choose among the adapted varieties. None of the varieties were sufficiently late in blooming to insure complete escape from frost damage. No doubt damage was held to a minimum by the comparatively ideal location of the test orchard. A few kinds, however, notably Vedette and Fair Beauty, spread over a longer blooming period and their chances of setting a crop under adverse spring weather conditions were enhanced. Also a few varieties, for example Redhaven, set such a heavy crop of buds that their chances of being completely wiped out by a frost are greatly reduced. The lowest temperature recorded dur-

ing the period of observation (1947-54) at Knoxville was 2°F. There was no wood or bud damage, except from the November freeze (10°F.) of 1950 when the mercury dipped suddenly following a mild fall. Even under such conditions there was no serious wood damage on any of the varieties.

Trees in the peach variety orchard at the other two stations have not fared as well from the standpoint of winter damage. According to station reports the 1933 planting at Jackson was declared a total and permanent loss after the —15°F. temperature that occurred in November of 1950. This peach trial consisted of the following varieties—Oriole, Golden Jubilee, Vedette, Valiant, Veteran, Halehaven, South Haven, Eclipse, Slappey, Georgia Belle, Early Elberta and Fertile Hale. From 1933 to the present time spring frosts at Jackson have repeatedly taken a toll by damaging blossoms and young fruits. This can be attributed largely to inadequate air drainage of the site at the West Tennessee Station. Temperatures in the test orchard are therefore usually lower at critical times than in neighboring orchards.

At Springfield, a frigid wave moved in the latter part of November 1950 and another cold front hit the area in February 1951. Minimum temperatures of —5° and —13° were officially registered for November and February respectively. The rapid temperature drop in late November caught the wood in an immature condition, due to late growing weather during the fall months. The result was much crotch, trunk and limb injury. By far the greatest amount of severe damage was found in the crotches of the scaffold limbs. It ranged from complete girdling to small patches of dead tissue on top and inside the crotch. Fruit bud kill during the 1950-51 winter was complete on all of the 11 varieties under observation. In March 1954 the orchard was scored (120 being perfect score) on the basis of crotch and trunk injury, breakage and splitting, killing of branches and internal killing of the heartwood of scaffold limbs.

Variety	Rating or Score
Golden Jubilee	120
July Elberta	113
Elberta	106
Sunhigh	100
Redhaven	98
Sullivan's E. Elberta	97
Triogem	91
Dixigem	71
Shipper's Late Red	71
Belle of Georgia	35
Rio Oso Gem	14

Trees with a rating above 90 appear to have a normal life expectancy as orchard trees. Those with a rating of 50-90 are of doubtful value as orchard trees, while those rating 50 or less must be considered of no orchard value. There was a light crop on all surviving varieties in 1952, while a commercial crop was picked in 1953 and 1954. Wood rotting fungi have developed fruiting

structures on the surface of many branches of badly damaged trees. This condition will probably become increasingly conspicuous as the injured trees continue to wane in vitality and usefulness.

Discussion and Conclusions

Over the years more attention has been given to varieties than to any other phase of fruit production. Varieties remain the cornerstone of fruit growing and the selection of the proper varieties for any given locality or set of conditions continues to be a serious and difficult matter.

The tendency has been to plant earlier high quality yellow fruit, with less and less emphasis on Elberta, although it remains the most important peach variety of the state. The earlier ripening kinds are also in a better position to avoid second brood curculio and oriental fruit moth attacks. Late maturing varieties are often seriously damaged by the larvae of oriental fruit moth unless carefully protected. The breaking of dormancy or rest period is not a problem in Tennessee, so the only reason for planting a variety with a low chilling requirement (650 - 800 hours), is because it possesses certain other desirable characteristics.

There is no one perfect variety of peach, so the search continues for a variety with a combination of the greatest number of desirable features. A grower cannot take a poorly adapted variety and fully compensate for its inherent weaknesses by planting it in fertile soil and adopting good management practices. An understanding of varietal performance is basic to successful fruit growing.

Extreme winter exposure does not seem to be our major environmental peach problem over the state but rather the unpredictable spring frosts that may kill the blossoms and newly set fruit. The answer to this peach problem does not seem to lie solely in a choice of varieties. Although some varieties such as Dixired, Erli-Red-Fre, Redhaven, Golden Jubilee, Triogem, Vedette and Fair Beauty appeared to be more reliable annual producers than certain others, the selection of sites having good air drainage remains the most practical and satisfactory way for the commercial peach grower to consistently assure himself of profitable annual yields.

The peach variety picture is in much sharper focus as a result of the screening process which has been in operation as a station project for an extended period of time. Accumulated data have revealed the superior adaptability of certain varieties. Such essential facts as processing and handling qualities, flavor, size, color, maturity dates, "shelf" life and market acceptability are known for over 75 different varieties. It is now possible to have a sequence of ripening peaches for eight consecutive weeks, beginning with Mayflower and finishing off the season with Lizzie or Late Elberta. There is no other fruit in Tennessee that provides edible and adaptable varieties over such a long, continuous harvest period as the peach.

Table I
Summary of Peach Variety Data

Variety	Ripens Weeks Before + After − Elberta	Fruit Size	Flesh Color (Yellow White)	Stone Condition	General Appear.	Quality	Yield	Texture	Processing
Varieties of Commercial Importance									
Dixired	+ 6	2	Y	1	2-3	2	3	2	Unknown
Erly-Red-Fre	+ 5½	3-4	W	2	3	3	3-4	2	Unknown
Dixigem	+ 4½	3-4	Y	4	3	3-4	4	3	4
Redhaven	+ 4	2-3	Y	3-4	4	4	4	3-4	4
Golden Jubilee	+ 3½	4	Y	4	3	3	4	2	3
Triogem	+ 3	3-4	Y	4	4	4	3	3-4	4
Fairhaven	+ 2½	3	Y	4	3-4	3-4	3	3	3
Southland	+ 2	3-4	Y	4	3-4	4	3	3	3
Halehaven	+ 2	3	Y	4	3	4	3-4	2-3	3
July Elberta (Bur.)	+ 2	3	Y	4	3-4	4	2-3	3	4
Sunhigh	+ 2	3-4	Y	4	4	4	2-3	3-4	4
Loring	+ 1	3-4	Y	4	4	4	3-4	3	3
Sullivan's E. Elb.	+ 1	3-4	Y	4	3	3	3-4	3	3
Georgia Belle	+ ½	3-4	W	4	3	4	4	3	3
E. Elberta (Gleason)	+ ½	3-4	Y	4	3-4	3	3-4	3	4
Elberta	0 (Aug. 1)	3-4	Y	4	3-4	3	3-4	4	3
Shipper's Late Red	− ½	3-4	Y	4	3	3-4	3	3-4	4
Afterglow	− 1	3	Y	4	3	3-4	3	3-4	2
Varieties Mostly for the Local Market									
Merrill Gem	+ 6½	2	Y	1	2	2	1	1	1
Hiland	+ 6½	2-3	Y	1	2-3	2	2	2	Unknown
Cherry Red	+ 6½	2-3	Y	1	2	2	3	4	1
Early East	+ 6	1-2	Y	2	2	2-3	3	2	1
Jerseyland	+ 4½	4	Y	4	3	3	3	2-3	Unknown
Raritan Rose	+ 4	3	W	3	3	3-4	3-4	3	3
Newday	+ 3	3-4	Y	3	4	3-4	3	3	3
Southern Glow	+ 3	3-4	Y	4	4	3-4	3	3	Unknown
Fireglow	+ 2½	3-4	Y	4	4	3-4	3	3	4
Wildrose	+ 2½	3	W	4	3	3-4	3	2-3	3
Nectar	+ 2½	4	W	4	3	3-4	2-3	3	2
Ambergem	+ 2	2-3	Y	1	3	4	3	4	4 (Pickling)
Fireball (False Sun.)	+ 2	3-4	Y	4	3	3	3	2-3	Unknown
Halegold	0	3-4	Y	4	3	3	3-4	3-4	4
Hale Harr. Brilliant	0	3-4	Y	4	3	3	3	3-4	3
Yates Elberta	0	3-4	Y	4	3	3	3	3-4	Unknown
J. H. Hale	− ½	4	Y	4	4	4	1-2	4	4
Rio Oso Gem	− 1	3	Y	4	3	3	2-3	4	4
White Hale	− 1	4	W	4	3	3-4	3	2-3	2
Honeygem	− 1½	2-3	Y	4	2	3-4	2-3	4	3
Late Rose	− 1½	3	W	4	2	3	3	2-3	2
Lizzie	− 2	3-4	Y	4	1-2	3	2-3	3-4	3
Varieties of Questionable Value									
Mayflower	+ 8	2	W	1	2	1	3	1	1
Merrill Brilliant	+ 7	2	W	1	3	2	1	1	1
N. J. 133 (Sunrise)	+ 6½	1-2	Y	2	2	2	3	2	1
Merrill Beauty	+ 6	2-3	Y	2	2	2	1	2	1
Mikado	+ 6	3	Y	1	2	1	2	1	1

Variety	Ripens Weeks Before + After — Elberta	Fruit Size	Flesh Color (Yellow White)	Stone Condition	General Appear.	Quality	Yield	Texture	Processing
Fisher	+ 6	2-3	Y	2	2	2	3	2	2
Starking Delicious	+ 5	2-3	Y	3	3	3	2	2	Unknown
Shinn Delicious	+ 5	2	Y	3	2	3	2	2	Unknown
Prairie Sunrise	+ 4½	2-3	Y	3	2	3	2	2-3	Unknown
Prairie Daybreak	+ 4½	2-3	Y	3	2	3	2	2-3	Unknown
Missouri	+ 4	2-3	Y	4	3	3	3	2-3	Unknown
Rosebud	+ 4	1-2	W	3	2	2	4	2-3	Unknown
Best May	+ 4	2	W	2	2	1-2	3	2-3	Unknown
Oriole	+ 4	2	Y	3	2	3	3	2	Unknown
Sunbeam	+ 3½	3	Y	4	3	3-4	2	3	4
Vanguard	+ 3	2-3	Y	3	2	2	3	2	2
Carman	+ 3	2-3	W	2	2	2	2-3	1-2	1
Cumberland	+ 3	3	W	3	3	3	3	2-3	3
Fair Beauty	+ 3	2-3	Y	3	3	3	4	2-3	2
South Haven	+ 2½	3-4	Y	4	3	3-4	3	3	3
Prairie Schooner	+ 2½	3	Y	4	2-3	3	3	3	Unknown
Rochester	+ 2½	2-3	Y	3	1	2-3	3-4	2-3	2
Prairie Rose	+ 2½	3	Y	4	3	3	2	2	Unknown
Vedette	+ 2½	2-3	Y	3	2-3	2-3	4	2-3	3
Redrose	+ 2	2-3	W	3	2	2-3	3	2-3	3
Valiant	+ 2	2	Y	3	2	2	2	2	3
Summer Rose	+ 2	2-3	W	4	2	2-3	2	2	Unknown
Eclipse	+ 2	2	Y	4	2	3	4	2	Unknown
Hiley	+ 2	3	W	3	3	3	3	2	3
Veteran	+ 1½	2-3	Y	3	2	2	3	2	2
Goldeneast	+ 1½	3	Y	4	3	3	3	3	3
Slappey	+ 1½	3	Y	4	2	2	2	2	2
Flaming Gold	+ 1	2-3	Y	4	2	3	2	2-3	2
Summercrest	+ 1	3	Y	4	3	3	3	3	Unknown
Pacemaker	+ 1	2-3	Y	4	2-3	4	2	2-3	Unknown
Redcrest	+ 1	4	Y	4	2	2-3	2	2	Unknown
Redelberta	+ 1	3	Y	4	3-4	3	3-4	3	2
Sungold	+ 1	2-3	Y	4	3	3	1-2	3	Unknown
Polly	+ 1	3	W	4	3	3-4	3	3	3
Halberta	— ½	4	Y	4	3	3-4	1-2	4	3
Fertile Hale	— 1	3-4	Y	4	3	3-4	2	3	Unknown
Good Cheer	— 1	3-4	Y	4	3	2-3	2	4	Unknown
Gold Drop	— 1	2	Y	4	2	2-3	2	3-4	Unknown
Halate	— 1½	4	Y	4	2-3	3	1-2	4	3
Constitution	— 1½	2-3	Y	4	1-2	3	1-2	3	Unknown
Late Elberta	— 2	3	Y	4	2	3	2	3-4	2

Scoring System Used in Variety Evaluation

The numerical values (4 representing top-value) indicate the relative rating for the several characteristics.

Rating	Fruit size	Condition stone	Gen. appearance	Quality	Yield	Texture	Processing
4	Large 2½" up	Perfectly free	Very attractive	High	Heavy	Very firm	Excellent
3	Medium 2-2½"	Generally free	Attractive	Good	Med.	Firm	Good
2	Small 1½-2"	Semi-cling	Average	Fair	Light	Medium	Fair
1	Very small 1½" down	Cling	Unattractive	Poor	Scattering	Soft	Poor