

A Comparison in Fruit Sizing Among Early and Late Peach Varieties

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The time interval between full-bloom and fruit maturity for peach varieties varies. This variation has been shown to be due to the relative length of the three stages in the growth of the fruit (1, 2). Among early and late peach varieties, the duration of Stage I (a period of rapid fruit growth beginning at full-bloom, Figure 1) is nearly identical. Duration of Stage II (a period of retarded growth associated with embryo development), however, varies depending upon the earliness of the variety. Early varieties have the shortest Stage II and the least embryo development, while late varieties have the longest stage II and the most embryo development.

Mid-season varieties are intermediate both in duration and the extent of embryo development. Variation among peach varieties in Stage III duration do exist, but these are not as closely related to earliness or lateness as are those in Stage II (1, 2). Since this work by H. Tukey, different peach varieties have become commercially important. Thus, it was of interest to relate these growth relationships with present day varieties.

Procedure and Results

Fifteen peach varieties having a range of fruit maturity from the early Dixired to the late Rio Oso Gem were selected in the variety block at the

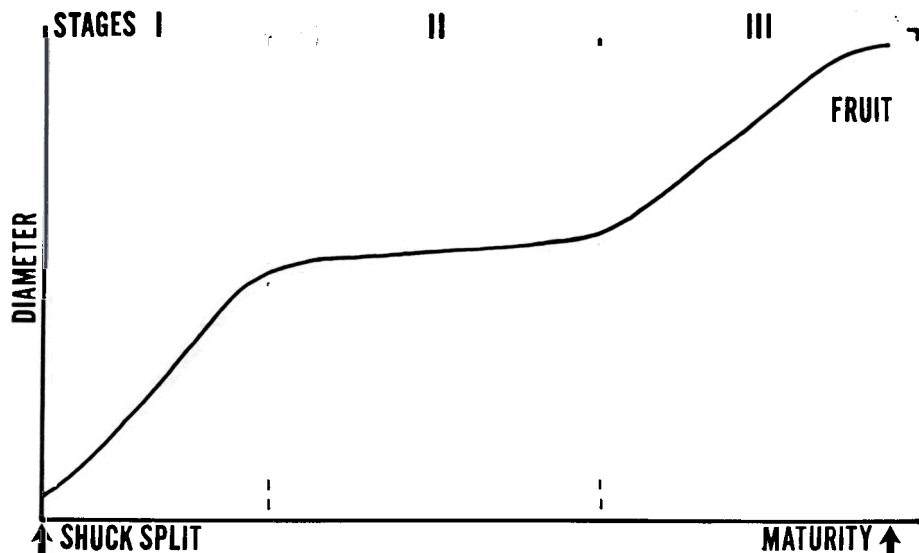


Fig. 1. The three stages of peach fruit enlargement. Stage II is a period of retarded development associated with embryo growth, and varies in duration with the variety.

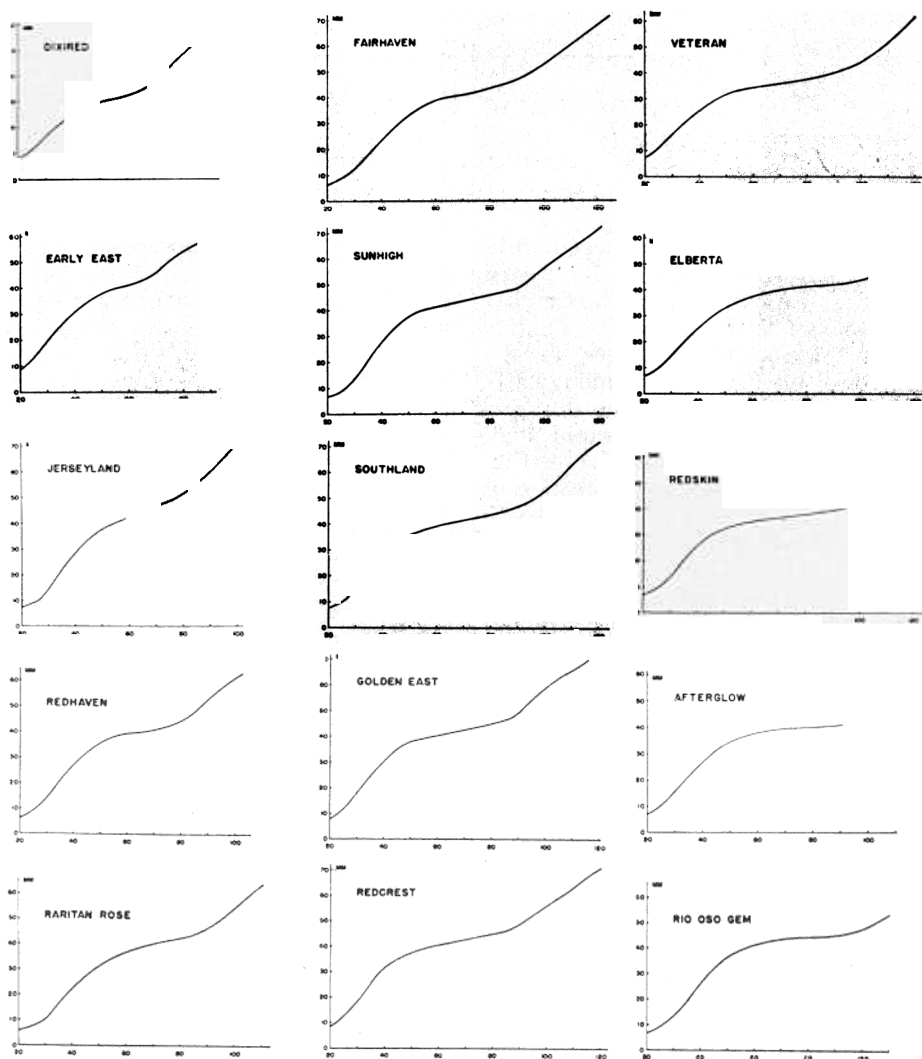


Fig. 2. The above series of graphs shows the size increase in fruits of different peach varieties following shuck fall. The horizontal axis of each graph represents days after shuck fall, and the vertical axis, diameter of the fruit in millimeters.

University Orchard in 1955. Fruit diameter measurements were obtained with Vernier calipers every three to five days from the time of shuck split to about maturity. Ten tagged fruits were measured throughout the study. Data are presented in graphic form for visual comparisons

among the varieties. Here, special consideration has been given to Stages I and II, and to most of Stage III, in order to show differences chiefly during the first two stages. No attempt was made to determine precisely the duration of each stage, or the transition from one stage to another.

TABLE 1. Varieties and Period of Ripening for Various Peaches in Relation to the Degree of Embryo Development Observed in 1955 at University Park, Pa.

Peach Variety	Fruit maturity by weeks in relation to Elberta ¹		Degree of embryo development observed in 1955
	6	Before	Abortive
	6	Before	Abortive
	4½	Before	Abortive
	4	Before	Abortive
	4	Before	Abortive
	2½	Before	Not fully expanded
	2	Before	Not fully expanded
	2	Before	Not fully expanded
	1½	Before	Not fully expanded
	1½	Before	Not fully expanded
	1½	Before	Fully expanded
	—	Before	Fully expanded
	0		Fully expanded
	1	After	Fully expanded
	1½	After	Fully expanded

¹Generally accepted period of fruit maturity.

Varieties in the left hand column of graphs in Fig. 2, have a much greater rate of size increase than do the remainder of the varieties. Those in the middle column, in general, have a more rapid rate than those on the right. The chief difference among the varieties is in the duration of the period of retarded fruit enlargement, Stage II. In Dixired, Early East and Jerseyland, it was almost absent, but very definite in Sunhigh and later maturing varieties.

At harvest, ten peaches from each variety were picked for embryo evaluation. Embryos which had integuments completely collapsed, resembling a piece of parchment, were considered as being "abortive." Those fully developed, filling the integuments, were considered "fully expanded," while those in between were considered "not fully expanded." These three groups were easily distinguishable with each variety given a general classification. Results are presented in Table 1.

Discussion and Conclusions

The data support that previously reported (1, 2). For all varieties meas-

ured, the first period of rapid enlargement of the fruit following full-bloom (Stage I) was approximately the same in duration and rate of increase. The length of the period of retarded growth (Stage II) was associated with the earliness of the peach variety. In early varieties (i.e., Dixired, Early East and Jerseyland) Stage II was almost absent and embryos were aborted. In late varieties, Stage II was very prominent and their embryos were fully developed. Mid-season varieties varied depending upon their relative earliness and lateness.

In conclusion, the earliness and lateness of peach varieties is primarily related to the duration of Stage II and degree of embryo development. However, the enlargement of the fruit following full-bloom (Stage I) is approximately identical for peach varieties.

Literature Cited

1. Tukey, H. B. 1933. Growth of the peach embryo in relation to growth of fruit and season of ripening. Proc. Amer. Soc. Hort. Sci. 30:209-218.
2. Tukey, H. B. 1942. Time interval between full bloom and fruit maturity for several varieties of apples, pears, peaches and cherries. Proc. Amer. Soc. Hort. Sci. 40:113-140.