

Rate of Growth of Fuerte Fruit

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The rate of growth of fruits has been measured by many horticultural investigators. The growth curves, plotted from measurements taken at certain intervals, are characteristic for each horticultural variety. The rate of growth of some varieties of fruits is very similar to that of other varieties. By rate-of-growth comparisons one may measure the response of fruits to seasonal differences and to fertilizer and irrigation practices.

The avocado industry in California is just reaching the commercial stage. New problems are met each year by both producers and marketers. This question might arise in regard to picking the crop: "Have the past Fuerte crops been harvested in the most intelligent manner?" A study of the growth rate of the fruit should help to answer this question in part.

The Fuerte variety was selected for rate-of-growth studies because it is the principal variety grown. The normal fruit setting period for Fuertes in the La Habra Heights section is from February 15th to May 15th. Some of the early set fruit reaches maturity the following November, and the late set matures about February 1st. These dates are approximate, as seasonal variations may change them as much as eight weeks. The bulk of the crop is harvested from January 1st to May 1st.

Collection of fruit measurement data began in July, 1931, and continued for four seasons. Ten average Fuerte trees were selected and ten fruits on each tree tagged—50 per cent inside fruit and 50 per cent outside fruit. The same group of trees was used each year. Measurements were made on normal crop fruits at monthly intervals. No off-bloom fruit was measured. Due to the pyriform shape of the fruit it was necessary to determine rate of growth by changes in volume. This was done by immersing each fruit in a graduated litre beaker partly filled with water, and reading the displacement on a specially constructed scale. All measurements were taken between 9 A. M. and 11 A. M. The work was continued into the spring months until the first indication of weakness in the fruit developed.

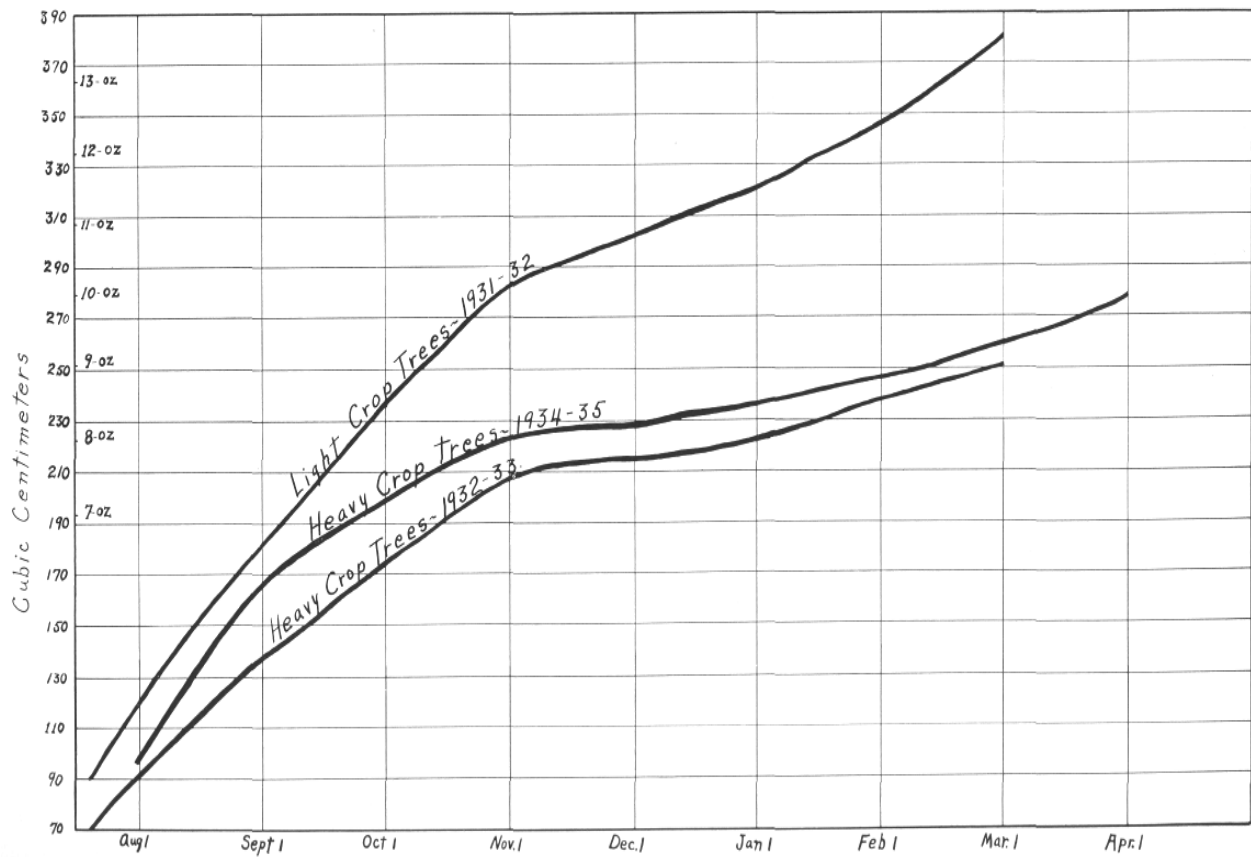
Growth curves for three seasons are shown on the accompanying graph.

The average growth curve of the Fuerte avocado shows a rapid increase in size of fruit from July through October. The period of slowest growth is from November to January. With the coming of warmer weather in the late winter and spring the rate of growth increases and continues until the fruit is about ready to drop.

Fruit sizes are given in weight (ounces) per fruit. In converting fruit size from cubic centimeters to ounces the ratio used was 1 ounce to 27.84 cubic centimeters. This ratio was calculated for horticulturally mature fruit.

Season	95% of crop picked	% of crop picked to Jan. 1	% of crop picked to Mar. 1	Average fruit size in ounces			Average increase Jan. 1 to March 1
				Oct. 1	Dec. 1	Mar. 1	
1931-32	Oct. 1 to Mar. 15	54.1	91.0	8.5	10.8	13.6	2.0 oz.
1932-33	Nov. 1 to May 1	22.5	65.2	6.3	7.6	9.0	1.1 "
1933-34	Nov. 1 to Apr. 15	18.3	61.1	6.2	7.8	9.6	1.1 "
1934-35	Nov. 1 to May 1	20.0	52.4	7.1	8.2	9.3	0.9 "

Rate of Growth - Fuerte Fruit



The year 1931-32 was a very light crop year for the trees in this study. Fruit growth was rapid, the average size on October 24, 1931 being 10 ounces, and on March 1, 1932, 13.6 ounces. A comparison of the growth curves for the years 1932-33 and 1934-35 shows the seasonal variations in rate of fruit growth. Both were heavy crop years. Average fruit size on November 1, 1934, was 8 ounces. In 1933 average fruit size did not reach 8 ounces until January 1. Fruit is smaller in heavy crop years than in light crop

years.

The above table shows picking data and fruit size for the Fuerte avocado. The picking data was taken from, figures compiled by Calavo Growers of California for District No. 5, which includes the Whittier, La Habra Heights, Yorba Linda, and Fullerton areas. The fruit size data was obtained from measurements taken in the La Habra Heights section on the P. J. Weisel ranch.

For the four years in this study Fuerte fruit size averaged 20 per cent larger on December 1 than on October 1. Early picked fruit is generally the largest on the trees at the time of picking. Fruit of 8.4 ounces weight on October 1, 1934 grew to 11.8 ounces on April 1, 1935, while smaller fruit grew from 5.6 to 7.9 ounces in the same period. The total weight increase for the large fruit was 3.4 ounces each and for the small fruit 2.3 ounces each.

For the season 1934-35, 10.9 per cent of the Fuerte crop was harvested by Dec. 1, 1934. Maturity tests on fruit picked by one grower (noted for having early-maturing Fuertes) showed that 61 per cent of all fruit delivered in October was graded "Fino" due to low maturity. In November the Fino grading due to low maturity was 13 per cent. If all the Fuerte fruit picked in District No. 5 (4870 field boxes) during October and November, 1934, had been picked in December, the total pick due to increase in size of fruit would have been about 5600 field boxes. At present the higher returns for early fruit more than offset what is gained in weight by leaving them on the trees for a few months longer. This, however, may not always be the case, and growers would do well to bear in mind the relationship of growth increase to selling price.