

Affect Lemon Fruit Growth

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Lemons growing under the desert conditions of Arizona blossom chiefly during March and April. The entire commercial crop is set at that time. Harvesting of this fruit normally begins in late September and is completed about mid-December.

The fruit is marketed under the California-Arizona lemon marketing agreement whereby a portion of the crop is sold as fresh fruit each week. The amount which each shipper can market is a percentage of the total estimated crop. Crop estimates are first made in early September, but may be revised as the season progresses.

Must Estimate Growth

Since the fruit continues to grow during the harvest season, the amount of growth must be considered in making the crop estimate. Growth of lemons under Arizona conditions has not been established to date. This report presents information on lemon growth and some of the factors affecting it.

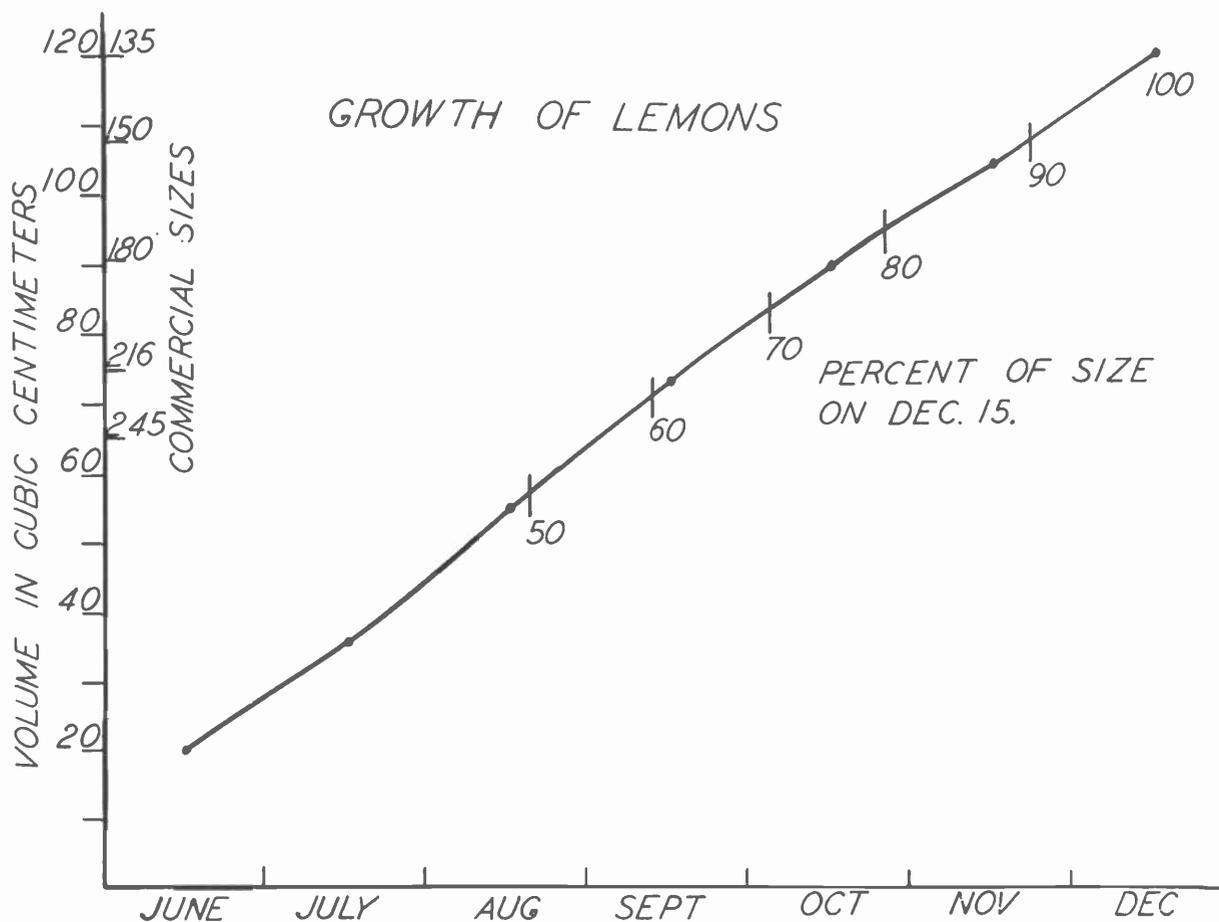
During each of the past five years the growth of lemons has been closely watched at the Citrus Experiment Station. Lemons on one to four trees have been tagged and measured at three to seven day intervals beginning in June and ending in December, January or February.

Growth Was Uniform

Average growth of these fruit between mid-June and mid-December for the five-year interval shows that lemons grew rather uniformly during this period, as shown on the accompanying chart. Growth continued after December 15, but since commercial harvesting had been largely completed at that time, the data was not included.

Between Sept. 15 and Dec. 15 average volume of the fruit increased from 73 to 120 cubic centimeters or a gain of 63 per cent. This was an increase from about commercial size 216 to size 135.

Fruit used to establish this growth curve was measured on different trees each year. These fruit represented different varieties, age of trees, fertilization,



yields, cultural methods and irrigation programs. Yearly growth and pertinent conditions are set forth in the table. The amount of fruit on the trees and the irrigation program influenced growth. However, the most important factor appears to have been climatic conditions.

Growth Reflects Rainfall

In 1957 the largest fall increase in size (73 per cent) occurred on heavy producing young trees. This large increase can be chiefly attributed to abnormally high rainfall of 2.82 inches which fell on six days during a 25-day period in late October and early November, and to the warm weather thereafter. The highest growth rates observed during the fall occurred during this interval.

A low fall increase of 57 per cent occurred in 1956. While the very large crop undoubtedly reduced growth, a series of cold nights with temperatures of 32° to 28° F. in late October and early November almost stopped growth during a 23-day period. Normal growth was resumed as the weather became

warmer, but the loss in growth was not made up.

Allowing the soil moisture to become low in October, 1954, also reduced the growth rate of the fruit. Although growth was above normal after irrigation in November, the loss was not completely made up.

Autumn Rains Important

The average growth curve for the five-year period represents the best data presently available for lemons which can be used for estimating size increases for marketing allotment purposes. It should be recognized that climatic conditions can markedly influence the growth rate.

Wet weather with above normal temperatures in October and November increases growth rates. Temperatures near 32° F. decrease or stop growth. To insure maximum fruit size the grower should irrigate before any of the soil in the major portion of the root system reaches the wilting point, particularly during the fall.

VARIATION IN LEMON GROWTH DURING FIVE YEARS

Variety	1954	1955	1956	1957	1958
	Eureka	Eureka	Eureka	Lisbon	Lisbon
Age Tree (years)	23	21	25	5	6
Yield (boxes)	5.8	3.5	8.2	2.8	1.9
Irrigation Program	dry Oct.	very wet	mod. wet	mod. wet	mod. wet
Climatic Conditions	warm dry	mod. dry	cold dry	warm wet	warm dry
Volume Fruit* (Sept. 15)	74	75	66	77	75
Volume Fruit* (Dec. 15)	115	124	104	133	125
Volume Gain*	41	49	38	56	50
Percent Increase	55	65	57	73	67

*Centimeters

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