

GIBBERELLIN DELAYS LEMON MATURITY

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THE REGISTRATION of gibberellic acid for use as a spray on lemons now permits a new method of maturity regulation for the lemon industry. The natural pattern of lemon fruit maturity is for much of the fruit to color and ripen prior to the favorable fresh fruit market that develops in hot summer weather. Gibberellic acid sprays can be used to delay the maturity of lemon fruits. The delay is beneficial and appears to be of economic value. The major benefits are (1) a more desirable production pattern in relation to market demands, (2) a larger percentage of fruit with a long storage life, and (3) a decrease in small tree-ripe fruit. These effects permit more flexibility in harvesting and marketing.

In general, gibberellic acid delays the loss of green rind pigments from citrus fruits. In the case of lemons, the response is an overall delay in maturity rather than a simple delay in rind maturity—as appears to be the effect on oranges. Delayed maturity has been demonstrated in detailed lemon experiments conducted during the past six years near Oxnard.

Grower-trials during the past two seasons in Ventura County, as indicated in the table, show that similar results were obtained. During the 1962-63 crop year, 41 grower-trials were established in Los Angeles, Riverside, San Bernardino, San Diego and Ventura counties. Results indicate that the delay in fruit maturity occurs under a wide range of environmental and cultural conditions.

In addition to delayed maturity that occurs in the crop year immediately following treatment, a shift in production patterns in the second year has been apparent in coastal experiments. This appears to be caused by altered flowering patterns in the first year. Fall applications reduced late winter and early spring production with a corresponding increase in production during the latter half of the season. This effect appears to be beneficial; thus, desirable results from one spray may be expected for two years. Whether this desirable shift in production will occur in interior areas has not been determined, but altered flowering has been observed.

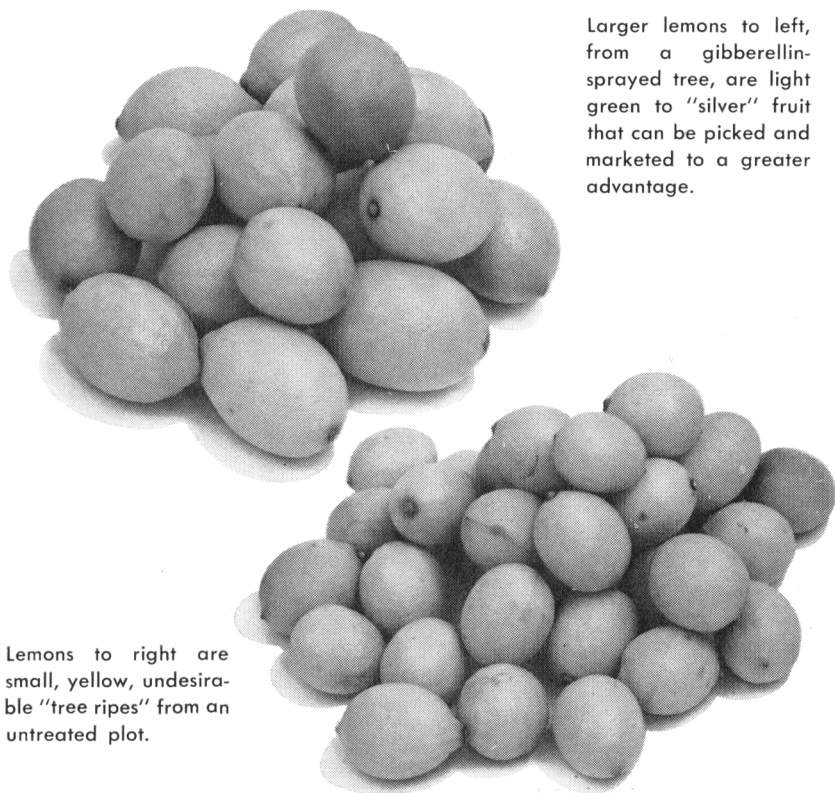
When gibberellic acid is applied two years in a row, an even larger difference in harvest pattern and maturity occurs. This is probably due to the combined effects of younger average age of fruits, plus the delayed maturity resulting from the second spray.

For four consecutive years in coastal experiments, gibberellin applications in November or December have caused no undesirable influences on trees or fruits. Although it appears that a similar situation will exist for interior areas, additional experience is necessary before such a statement can be made.

Gibberellin is still relatively expensive, but it is anticipated that it will give beneficial results (1) where delayed maturity is desirable, and (2) where a small "tree-ripe" problem exists.

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Larger lemons to left, from a gibberellin-sprayed tree, are light green to "silver" fruit that can be picked and marketed to a greater advantage.

Lemons to right are small, yellow, undesirable "tree ripens" from an untreated plot.

RESULTS OF THREE GROWER-TRIALS OF GIBBERELLIN SPRAYS ON LEMONS IN VENTURA COUNTY DURING 1961-62

Plots	Boxes per tree			Per cent			
	Harvested	Stored	Per cent Stored	Green	Light green	Silver	Yellow
Eureka/Grapefruit; 13 years old							
Sprayed 12-9-61; washed 2-28, 4-16, 6-22 and 8-30-62							
Gib.	9.2	6.7	72.8	16.3	41.0	38.1	4.6
Control ..	6.9	4.9	71.0	11.2	27.3	46.1	15.4
Eureka/Sweet; 31 years old							
Sprayed 12-13-61; washed 2-27, 4-28 and 7-16-62							
Gib.	7.2	5.2	72.2	11.9	42.8	34.3	11.0
Control ..	7.0	5.4	77.1	8.5	40.4	26.1	25.0
Lisbon/Sweet; 33 years old							
Sprayed 12-13-61; washed 1-28 and 3-26-62							
Gib.	2.3*	1.3	56.5	3.7	15.3	63.2	17.8
Control ..	2.9*	1.3	44.8	1.4	10.6	51.1	36.9

* All remaining fruit was harvested 3-31-62 prior to bulldozing grove (Gib. = 4.3, Control = 4.0 boxes per tree).