

# Lemon Cuttings with Fruit Rooted

means of prolonging useful life of lemon fruits developed at Riverside valuable aid in research

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Light green Eureka lemon fruits—with 1" to 2" stems—were rooted successfully in an experiment designed to develop a means of prolonging the useful life of lemon fruits for studies of a physiological, biochemical, and entomological nature.

Detached lemon fruits are utilized in many general and specialized research problems but a major drawback to their use has been the relatively short period during which they would remain turgid and more or less normal.

A simple solution to the problem seemed to be the production of roots on stems attached to the fruits. Such a technique should not only result in maintaining healthy turgid fruits for long periods under the usual conditions of high humidity but also should permit studies involving low relative humidity.

An experiment was initiated to determine the rooting response of lemon cuttings with fruits attached.

On February 7, 249 medium-sized lemons—ranging in color from yellow to light-green—were clipped from several Eureka lemon trees. Stems on the fruits varied from 1" to 2" in length, and approximately half of them had one or two leaves attached.

The fruits were segregated into three color groups of yellow, silver, and light-green. The silver category is a packing-house designation for yellow fruit which still retains a slight amount of green color, usually at the ends. Each color group was subdivided into cuttings with and without leaves. These groups were further divided into groups to be treated with a rooting preparation—0.2% naphthalenacetic acid on talc, ANA—or left untreated. The cuttings were placed in a rooting bed, with sand as a rooting medium, and were usually sprinkled two or three times daily during the rooting period.

A count of rooted cuttings and roots

was made on March 6, four weeks after the start of the experiment. Cuttings with light-green lemons attached rooted most readily, whereas those with yellow lemons rooted least readily. The presence of leaf tissue appeared to be unnecessary in the cuttings with light-green and silver lemons but necessary for root formation in the cuttings with yellow lemons. Naphthalenacetic acid increased the percentage of rooted cuttings in all comparisons.

Leafy lemon cuttings have been reported to root better than leafless ones, even when treated with a growth regulator such as indolacetic acid.

In the present study it was found that leaves were not essential for the rooting of cuttings when light-green or silver-colored lemons were attached.

It appears that immature lemon fruits can supply the same factors as are ordinarily supplied by the leaves. Sugars and nitrogen are present in both green and yellow lemons. Whether these factors become less available for mobilization to the base of the cutting as the fruit matures, or whether other factors for rooting are concerned requires further investigation.

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Rooting Response of Lemon Cuttings

	Light-green				Silver				Yellow			
	Leaves		No leaves		Leaves		No leaves		Leaves		No leaves	
	No ANA	ANA	No ANA	ANA	No ANA	ANA	No ANA	ANA	No ANA	ANA	No ANA	ANA
No. cuttings . . . .	38	37	31	26	21	22	13	12	13	15	10	11
Percentage rooted	31	59	52	81	10	68	15	67	8	67	10	18
Roots per rooted cutting.	1.8	3.8	3.3	3.0	1.5	4.4	1.5	2.4	1.0	3.9	5.0	7.5

## WATER SPOT

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In the experimental block at Pomona application of the treatments was made late in the season. A design of one pair of trees per plot replicated three times was laid out in a block with over-all dimensions of two by 33 rows.

The date of harvest in this block was delayed and the fruit was held on the trees. The fruit that dropped from the trees was examined for rind breakdown due to water spot and a count made of the number affected and unaffected for each tree on three occasions during the harvest season, February 12, March 14, and April 22.

Water spot injury during the 1951-

52 season occurred for the most part as a result of two periods of rain. The first of these consisted of heavy rains during the latter part of January accompanied, on several occasions, by freezing temperatures while the fruits were still wet or partially so. These conditions were largely responsible for the shoulder spot type of injury—so prevalent among the fruit observed at the Azusa and La Verne orchards.

The second rainy period which contributed to water spot damage occurred in mid-March when the rains were not followed by freezing temperatures. Water spot developed through the penetration of water into the rind tissues. The fruit at Upland was subject to both of these sets of water spot conditions. This

would account for the much higher incidence of water spot in the oil sprayed plot of this orchard than was found in the similar plots of the orchards at Azusa and La Verne.

The data obtained in these studies support the general observations, made by packing-house managers and by field men concerned with the crop, and show that the incidence of water spot was less in plots treated with parathion wettable powder than it was in those sprayed with oil.

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