

EUREKA lemons on their own roots have nothing to recommend them.

Extensive investigation of the citrus rootstock problems was initiated by the Citrus Experiment Station, Riverside, in 1926. A method for rooting and handling cuttings was developed, and between 1931 and 1936 seven navel orange, 11 Valencia orange, and five Eureka lemon field plots were established.

Lemon cuttings have been consistently less productive and, except for the first four years, less vigorous than budlings, while no consistent differences have occurred in the oranges. For this reason a report on the lemon is warranted primarily as a means of caution against extensive planting of lemon cuttings.

Five Plots Used

Four plots were planted in close proximity to one another near the Upland foothills, San Bernardino County; three of them in 1932 and one in 1933. In each plot both the cuttings and budlings, on grapefruit rootstock, are progenies of one parent, and for each plot a different parent was used. The soil is classed as Hanford rocky sandy loam.

Lemons Budded

on grapefruit or sweet orange rootstocks superior to self-rooted Eurekas

F. F. Halma

The fifth plot, located near Oxnard, Ventura County, California, was planted in 1936. The cuttings and budlings are progenies of one parent, and the rootstock is sweet orange. The soil is a Yolo fine sandy loam.

These five plantings included 334 cuttings and 337 budlings, five Eureka lemon scion strains, and grapefruit and sweet orange rootstocks.

In the Upland planting the trees were planted bareroot. The number of lateral roots per cutting ranged from one to 12.

The Oxnard plot, planted in 1936, consisted of 24 of each of cuttings and budlings. They were transplanted with the roots balled.

Tree Condition

For the first three years in the orchard the cuttings were more vigorous than the budlings. During the fourth year several cuttings in the Upland plots showed signs of weakness; they became less densely foliated, and the leaves were mottled in varying degrees. At the end of the fourth year this condition became more general, and all observers agreed that the budlings were not only more vigorous than the cuttings but that they also showed much less variation in tree condition.

Now, after 16 years, only 16% of the cuttings in one plot and 30% in another are comparable in size and vigor to the average budling.

The situation in the Oxnard plot is even less encouraging. Here the difference in favor of the budlings after 12 years is even greater than in Upland, and for several years past the trees have been considered a liability.

Relative Hardiness

Besides less vigor and smaller yield, the cuttings also proved to be less hardy than the budlings.

The January, 1937, freeze occurred when the trees in Upland started to produce commercial crops. Since none of the four plots was equipped with heaters, the trees suffered severe damage.

It was soon evident that the cuttings were damaged more than the budlings.

In fact, in two of the plots the cuttings were removed because they were not considered worth saving; the budlings in these plots made a good recovery.

In the other two plots, where the damage was not quite so severe, the budlings recovered more rapidly than the cuttings. For 10 years after the freeze the leaves of the cuttings were more or less mottled, while those of the budlings were normal.

Yield

The trees produced light crops in 1935 and 1936, and a good crop was in prospect when the January, 1937, freeze occurred. In 1939, yields were again recorded and continued until 1942 when, due to the labor shortage brought on by the war, no further records could be obtained. However, periodic observations

The effect of the 1937 freeze on a cutting (upper left) and the same tree (upper right) one year later. Note the budling (lower left) after the 1937 freeze and its recovery (lower right).

