A COMPARISON OF CITRUS ROOTSTOCKS BEING USED IN THE INDIAN RIVER AREA

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SOUR ORANGE

In checking back into the history of citrus on the Indian River I find that sour orange has always been by far the most popular rootstock. Although there were some plantings of sweet orange, grapefruit and rough lemon rootstock. It was fruit grown on this sour orange rootstock which established the Indian River reputation for excellent quality. Sour orange, being resistant to foot rot, is well adapted to the low poorly drained soils of this area. It has the added advantage of being the most cold resistant of the presently used stocks.

Sour orange would still be the preferred rootstock if it was not susceptible to tristeza. However, this insect transmitted, virus disease has greatly changed the picture. Most growers now feel that they must plant at least part of all new plantings on tristeza tolerant rootstocks.

Another important factor which is effecting the choice of rootstocks for new plantings is the quality of the land being planted. There is little of the so-called heavy "sour orange" land still available for planting. The growers are now moving out onto the lighter soils and are switching to other rootstocks.

CLEOPATRA MANDARIN

In the late 1940s there were alarming reports from South America of a new disease, tristeza, which was rapidly killing all citrus trees budded on sour orange rootstock. In the early 1950s this disease was reported present in Florida. This lead to an immediate demand for a tolerant rootstock to replace sour orange. Of all the stocks considered, at that time, cleopatra mandarin seemed to offer the best possibilities for the Indian River. It produces fruit of good quality, it is tolerant to tristeza and resistant to foot rot. In addition to these advantages it appears to be only slightly less cold resistant than sour orange.

Some reports indicated that trees budded on cleo were inclined to be shy in bearing. Fortunately, this did not prove to be the case on our heavy Indian River soils. However, we found it necessary with this rootstock to raise the pH to 6.5 or 7.0 and use dormant nutritional sprays containing zinc, manganese and boron in order to get good growth and production. All varieties seem to grow and bear well, producing fruit of good quality. Practically all varieties budded on cleo produce fruit having slightly lower acid with consequent earlier maturity. There also seems to be a definite tendency of cleo root to produce fruit of smaller size on most, if not all, varieties. In the case of grapefruit, this small size may delay picking until quite late. Where the crop is heavy this usually reduces the crop for the following season thus creating somewhat alternate bearing. Pineapple oranges also tend to be alternate in bearing but this does not seem to apply to valencias.

Temple oranges on cleo produce fine quality fruit which usually matures quite early. The fruit is produced largely on the outside of the trees and is easy to over-estimate. Temples on cleo will not produce as much fruit per tree as the same age tree on sweet or sour orange.

SWEET ORANGE

Sweet orange is another rootstock which is tolerant to tristeza. It produces high yields of fine quality fruit on most varieties. Both trees and fruit seem to be nearly as cold resistant as sour orange. Temples, grapefruit and Orlando tangelos budded on sweet orange usually mature early and produce larger fruit than these varieties budded on sour orange or cleo.

The principal objection to sweet orange rootstock is its susceptibility to foot rot. Every precaution must be taken to prevent this disease. In selecting land for sweet root it is desirable to avoid heavy, dark soils and use only the medium sands or sandy loams. Be sure to provide excellent drainage. Use fairly high beds and set the trees high in good big mounds. Check the trees regularly and keep the top of the crown roots exposed. Keep mulch and soil away from crown roots and trunks. After trees have been planted two or three years wash the soil away from the crown roots with a spray machine. If there are any signs of foot rot be sure to treat immediately with lime sulphur solution or bordeaux mixture.

Sweet root has a slightly higher moisture requirement than sour orange and it has been
my observation that it does not grow and produce well on highly alkaline soils.

**ROUGH LEMON**

Rough lemon is tolerant to tristeza. It has a lower moisture requirement than all of the other commercial rootstocks. It grows well and produces high yields even on light sandy soils.

Rough lemon, like sweet orange, is very susceptible to foot rot. All the precautions suggested for sweet orange should also be observed for this rootstock.

Another serious objection to rough lemon is that it produces fruit of poor internal quality with all varieties. It is particularly undesirable to plant rough lemon on good land for the better the land the poorer the quality of the fruit. During wet years red grapefruit, and sometimes even marsh seedless, grown on rough lemon may produce fruit with such low solids that it will never meet the maturity standards.

Trees on rough lemon, grown on alkaline soils, have a comparatively short life. The more active the marl the shorter the life of the trees. I observed lemon rooted grapefruit planted on Palm Beach sand, which has a subsoil pH of about 8.4, that started to die by the time they were four or five years old and none of them lived through their tenth year.

The use of rough lemon as a rootstock for fresh fruit varieties on the Indian River will soon destroy our reputation for producing quality fruit. Furthermore, it could readily eliminate the premium price we have enjoyed for so many years. If we are to protect this priceless reputation it is the duty of each and every Indian River grower to use only those rootstocks which will produce fruit of the highest quality.

**FUTURE ROOTSTOCKS**

Other rootstocks may soon be in general use. The Florida Citrus Budwood Registration Program has now made available budwood of most varieties which are free of psorosis and xylorhiza and some varieties which are free of exocortis. This will permit the use of other promising rootstocks such as trifoliata, Rangpur lime and probably others which are tolerant to tristeza. Plantings on these rootstocks are still too young to give us much information but so far they look quite promising.

**A ROOTSTOCK TRIAL FOR TAHITI LIMES IN DADE COUNTY, FLORIDA**

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**INTRODUCTION**

There were, in 1961, about 5700 acres of Tahiti (Persian) limes in Florida, the greater part of which (about 85%) were in Dade County. The remainder, chiefly in Polk and Highlands counties, was decimated by the freeze of December 1962.

Limes in Dade County encounter soil problems not found in other areas of the State where citrus is grown. The oolitic limestone (Rockdale series) characteristically has a pH of about 8.0 and, while porous in nature, may present problems of root penetration and extension. Because of these characteristics one might expect that the performance of some rootstocks, at least, would be very different than in more conventional soils.

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The present experiment was initiated in order to test the performance of Tahiti limes on a number of rootstocks under these unusual soil conditions.

Rootstock trials with citrus are generally considered as long-term projects and to be of doubtful value unless pursued for an extended period. With limes in Dade county, however, the vicissitudes of the weather such as hurricanes, floods, and even occasional freezes, coupled with the devastation caused by wood pocket disease, greatly curtail the period during which valid records can be secured. Consolation is found, however, in the fact that lime trees grow rapidly, fruit early in their life, and likewise decline early so that they can be considered a short-term crop when compared to other citrus in other areas. However, the use of disease-free budwood, particularly that free from wood pocket disease, should aid in prolonging the productive life of Tahiti lime trees.