

Citrus Maturity and Packinghouse Procedures

III. Commercial Rootstocks

Virtually all of the citrus area in Florida is comprised of scion varieties budded on any of a wide range of rootstocks. A few seedlings, principally sweet orange, still exist in a few groves but the trees are large, old and generally remain only as sources of budwood. Fruit characters of trees in commercial groves are thus those of a 2-component system in which inherent qualities are influenced to a greater or lesser degree according to the particular rootstock used. Commercial rootstocks for citrus have been chosen in the past principally for their adaptability to soil and climatic conditions along with heavy, uniform bearing and acceptable market quality of the fruit. Choice of rootstocks in recent decades has included resistance to burrowing nematode and various disease problems, such as foot rot, tristeza, excoortis, young tree decline, etc., as additional criteria. Numerous rootstocks, like Carrizo citrange (trifoliolate orange x sweet orange hybrid), alemow (*Citrus macrophylla*), Palestine sweet lime, Rangpur lime and others, are being utilized in many areas of the state for trees in new groves and as replacements in older groves, particularly as substitutes for rough lemon. Certain of the old standard rootstocks, such as grapefruit, sweet orange and trifoliolate orange, have virtually ceased to be planted, except for occasional trees in special-purpose situations. Curiously, sour orange has persisted as a major rootstock in spite of losses from tristeza in poorly drained sections like the Indian River. The following comments refer to the general influences of rootstock-scion variety combinations on fruit characters, said influences being subject to the effects of various modifiers, particularly preharvest factors, as will be discussed later. It should be borne in mind, however, that rootstocks per se are the single most important modifiers of fruit characters. All of the rootstocks used for citrus fall into 2 fairly distinct groups denoted here as rough lemon and sour orange.

Citrus Maturity and Packinghouse Procedures

Commercial Rootstocks (cont.)

Rough lemon group: Trees on rough lemon, Rangpur lime, Palestine lime and alemow characteristically bear large crops of large, coarse-textured, light-colored fruit which have lower total soluble solids and acid. Fruit of specialty types, such as tangerines, tangelos or Temple, tend to hold poorly on the trees and dry out or become puffy shortly after reaching peak edibility. Fruit of trees on Palestine sweet lime have notoriously poor quality as bearing begins but improve in later years. Reduction of total soluble solids is approximately the same regardless of scion variety, hence this is of far greater importance for cultivars which naturally have relatively low total soluble solids.

Sour orange group: Trees on sour orange, sweet orange, Cleopatra mandarin, grapefruit, trifoliolate orange, Troyer citrange, Carrizo citrange and similar rootstocks typically bear small to medium crops of small-to-medium-sized, smooth textured, deep colored fruit with total soluble solids about 1 to 2% higher and acid also higher than on rootstocks of the rough lemon group. Fruit tend to hold better on the tree and not to dry out or become puffy as readily. Trifoliolate orange is recognized as the best rootstock for satsumas, a variety seldom grown in the main part of the citrus area. It is an excellent rootstock for other varieties but has seldom been used because of its susceptibility to exocortis and preference for relatively heavy well-drained soils. Cleopatra mandarin is considered a good rootstock for specialty fruits, particularly in areas where cold hardiness is an important factor.

Direct comparisons among rootstocks of the 2 groups are complicated by their differing adaptability to soil conditions, crop load, variations from one year to another, the existence of numerous strains of both rootstocks and scion varieties, and numerous other factors. The general pattern may be seen, however, in Figures 3 and 4 for 'Duncan' and 'Marsh' grapefruit on rough lemon and sour orange at 27 locations scattered over the state.

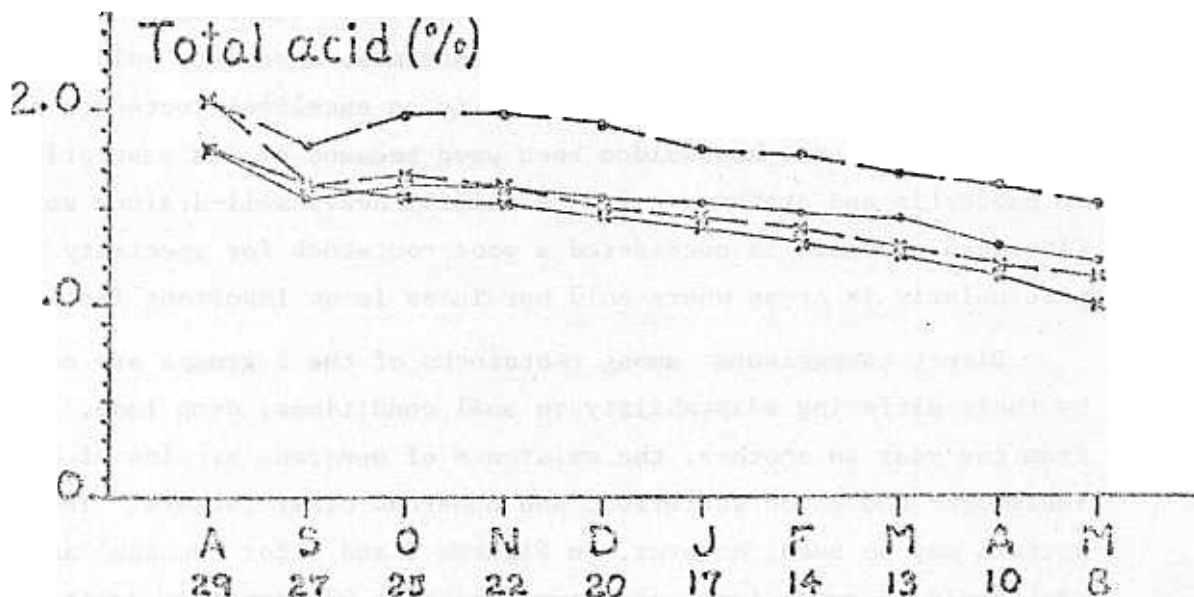
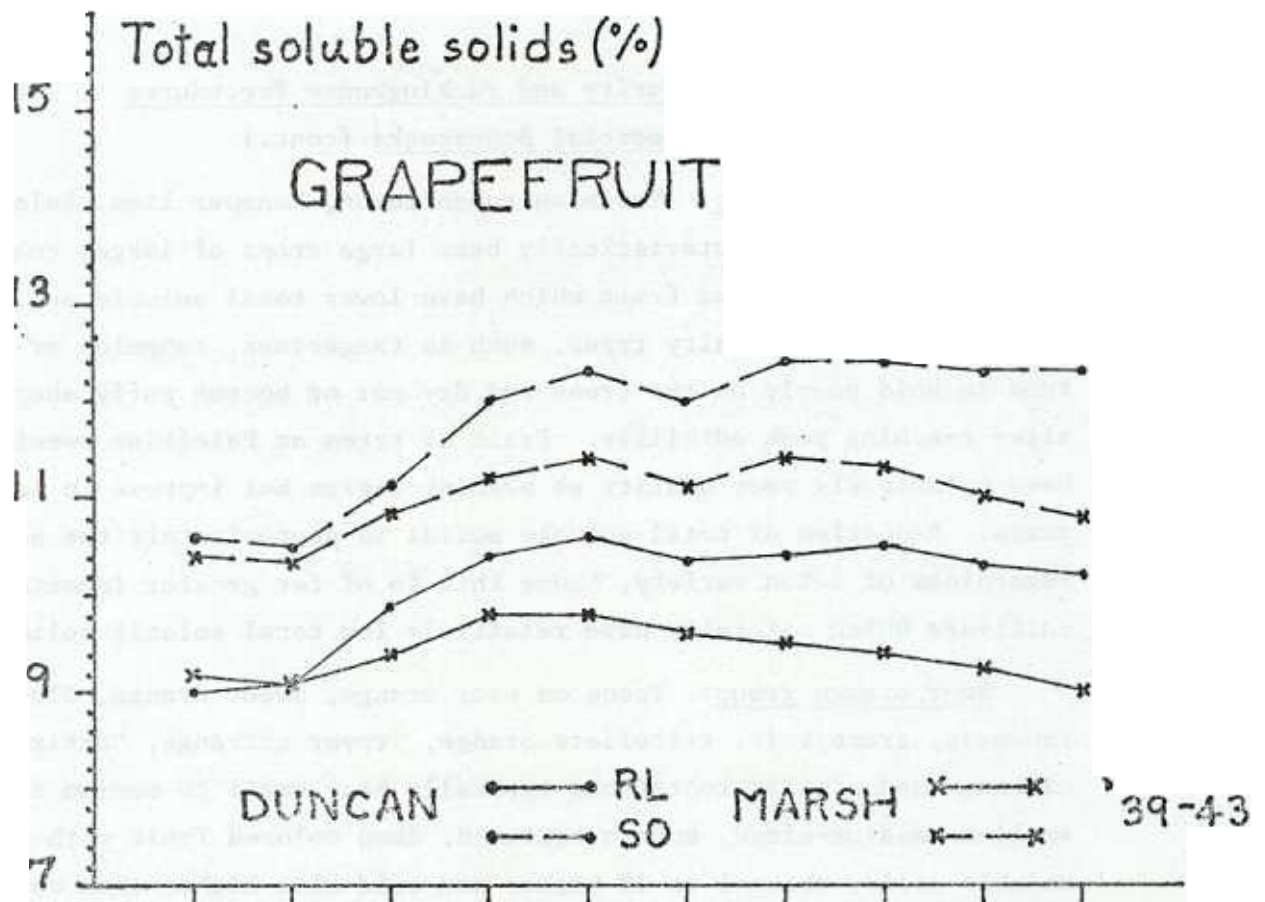


Figure Comparison of total soluble solids (%) and total acid (%) of 'Duncan' and 'Marsh' grapefruit on rough lemon (RL) and sour orange (SO) stocks at 27 locations. (Values are averages for 1939-40 through 1942-43 seasons. Sample dates are \pm about 4 days.) (Harding FSHS 78, 1945.)

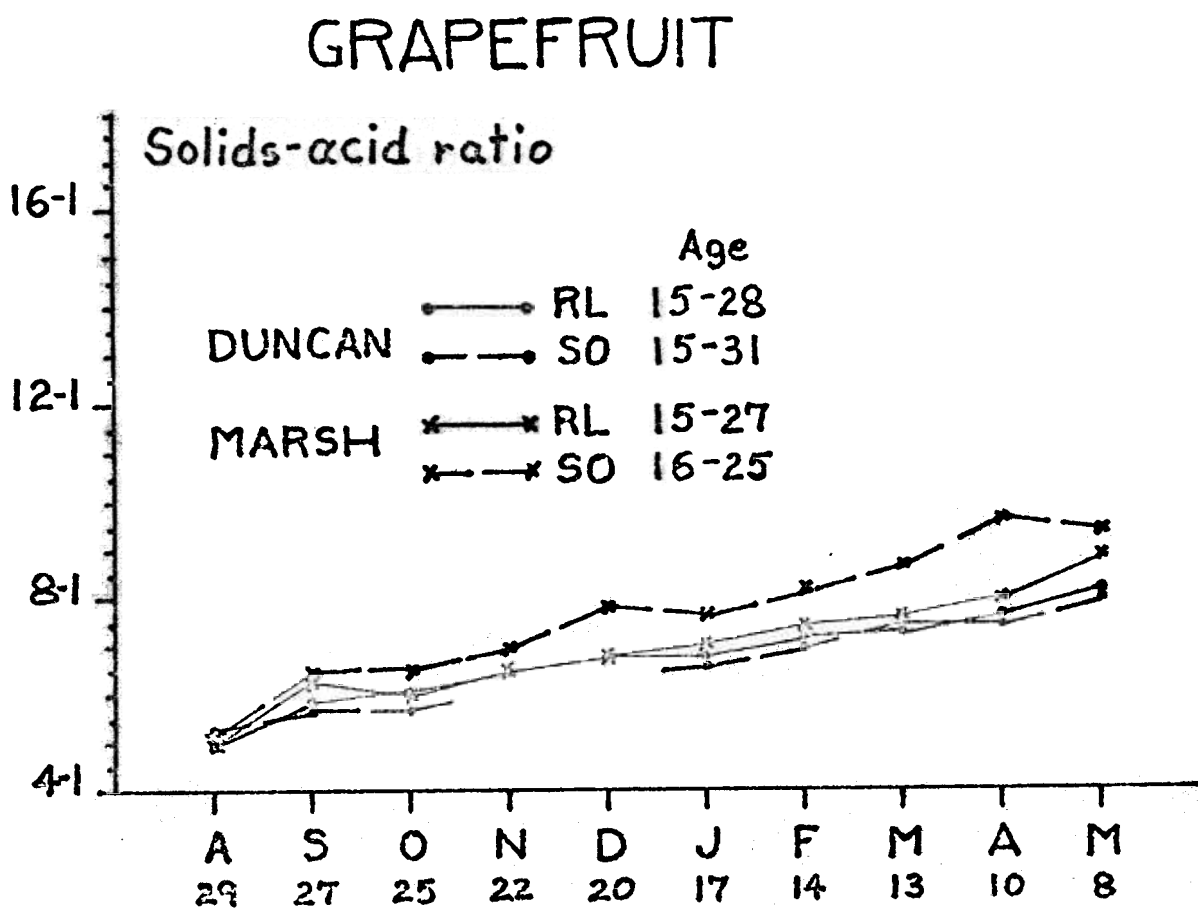


Figure 4. Soluble solids acid ratios of 'Duncan' and 'Marsh' grapefruit on rough lemon (RL) and sour orange (SO) stocks at 27 locations. (Values are averages for 1939-40 through 1942-43 seasons. Sample dates are \pm about 4 days.) (Harding FSHS 78. 1945.)

Citrus Maturity and Packinghouse Procedures
Commercial Rootstocks (cont.)

Selected References

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also Selected References for Chapter II)