

# Rootstock Selection

By Dr. Bill Castle

Choosing a rootstock is an important decision. It should be carefully considered because such decisions are relatively permanent in their effect and, thus in their long-term significance. The steps involved in choosing a rootstock may not always be obvious, but there are factors that traditionally have been important. Among these are the experiences and opinions of friends, neighbors, nurserymen, and the grower himself. The information can be conflicting and confusing, making the choice of a rootstock unnecessarily difficult. What follows is just one approach that may be helpful in selecting the best rootstock for your conditions.

## **GATHER THE FACTS ABOUT YOUR SITE**

There is no substitute for having available as much factual information as possible. Information should be obtained regarding:

1. Soil – Texture, depth, hardpan, pH, chemical characteristics, water holding capacity, drainage, nutrient status, etc.
2. Elevation and air drainage – These factors are strongly related to the potential for cold damage.
3. Nematodes – The presence of the parasitic citrus and burrowing nematodes has the potential for simplifying a rootstock decision because of the ease with which many choices can be eliminated. Even if this information is not used in the decision-making process, it is still useful.
4. Historical – If a new site is being planted, learn about the successes and failures of your neighbors. If an area is being replanted, consider the reason for replanting.

## **KNOW YOUR OBJECTIVE**

Many decisions are made within the framework of a well-defined goal.

Therefore, it is important to consider:

1. Scion cultivar – Like choosing a rootstock, the cultivar selected represents a choice not often or easily changed after planting.
2. Market – Juice quality may be less important than yield if the fruit is for processing, and this would affect the choice of rootstock. If the fruit is for the fresh market, the influence of the rootstock on external quality may become more important.

3. Time – If you have a short-range goal, a tree on a vigorous, productive rootstock might be appropriate. For long-range objectives, another citrus rootstock with different characteristics may be more suitable.

### **KNOW THE ROOTSTOCKS**

There are two readily available sources of information on rootstocks. Each provides a different perspective. They are:

1. Experience – Few growers have hesitated to plant trees on rootstocks such as Carrizo citrange because this stock and its characteristics are well known. The boundaries of its performance have been established from years of commercial use. Practical experience has also shown that it has limitations; nevertheless, this rootstock is generally more acceptable than others that are untried. Confidence (and less risk) is derived from knowledge.
2. Field experiments and research data – a major function of rootstock research is to determine the commercial potential of new rootstocks and also to ensure that the capabilities of currently used rootstocks are completely and clearly understood. The various field experiments established for this purpose, including those in commercial groves, represent essentially the only source of data regarding new rootstocks. As a result, they are likely to provide answers for today's important issues, such as the incidence of blight among trees on Carrizo citrange. It wasn't too many years ago the Volkameriana lemon and Swingle citrumelo rootstocks were unknown in Florida. Now, one of these, Swingle, is of considerable commercial interest.

### **CHOOSING THE ROOTSTOCK**

The first three steps are the relatively simple information gathering process, which provides a sound foundation for the final step – selecting a rootstock.

There are several factors that combine to make the final step more difficult than the preceding ones. These include the lack of complete information about any rootstock as well as recognizing that no rootstock is perfect. Unfortunately, all the desirable attributes for a Citrus rootstock have never been combined in one rootstock. Every rootstock has certain weaknesses as well as advantages. Perhaps more importantly, though, is that all rootstocks do not have the same disadvantages or strengths.

Another consideration affecting the choice of a rootstock is the relative importance given to individual rootstock effects. To illustrate this point and those mentioned above, consider, for example, trees on Citrus macrophylla. They are precocious, bear well, and are highly resistant to foot rot; however, they are also very easily cold damaged and the fruit have a poor quality juice. Which of these traits is of greatest concern under your grove site conditions and with your objectives?

In Florida, the choice of a rootstock is generally based on a combination of concern for productivity and tree survival. The fundamental question with fruit produced for processing is how to produce the maximum quantity of soluble solids with the minimum number of risks. Therefore, priority is normally given to rootstock effects on yield, but sometimes other factors become limiting. Examples in Florida are the potential for cold damage and susceptibility foot rot or root rot, tristeza and blight. In contrast, some rootstock characteristics are essentially non-limiting or can be controlled are, therefore, less important. If trees on a cold tolerant, productive rootstock are susceptible to drought, they can be irrigated.

The final step in selecting a rootstock essentially involves developing a composite assessment of a rootstock based on its individual characteristics and then choosing the rootstock that best matches your interest and goals. As no one rootstock is likely to be entirely satisfactory in any set of circumstances, it is often wise to consider using two or three. If two or more are selected, setting a grove so that trees are planted on alternation rootstocks is not recommended. Rootstocks should be selected to match specific, local conditions especially when planting the highly variable soils found in the Flatwoods. Soil and drainage are critical factors and are often the basis for rootstock decisions. It is the author's opinion that soil and yield are priority determinants. Differences in juice quality usually do not exceed the larger differences in yield among rootstocks.

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