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Avocado Clonal Rootstock Production Trial: A View after 8 Years

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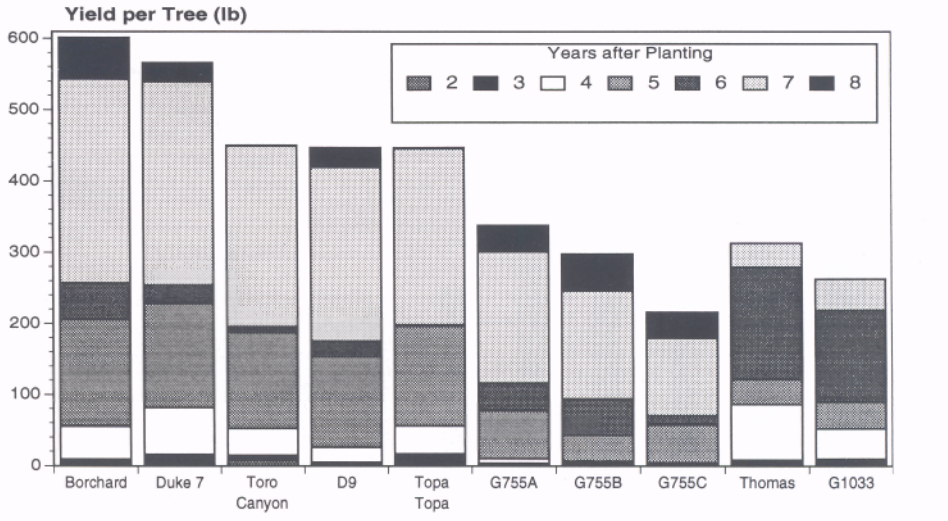
There has been extensive research conducted by the University of California to identify rootstocks which are resistant to *Phytophthora cinnamomi,* but little evaluation of the horticultural attributes of these selections has been made. A project was established in 1986 with the primary goal to assess the horticultural attributes of promising clonal rootstocks. The results from this study will help to provide guidelines for distinguishing between avocado clonal rootstocks beyond the criteria of disease resistance.

The project that we report here was planted in 1986 in a *Phytophthora* root rot free field. In this trial we are evaluating the performance of 'Hass' variety on the G755A, G755B, G755C, Toro Canyon, Borchard, Duke 7, D9, Thomas, and G1033 clonal rootstocks. We also have clonally propagated Topa Topa included in the trial. Due to tree availability at the time of planting, the Thomas and G103 3 trees were planted in 1987 and are, therefore, one year younger.

Figure 1. Cumulative Yields of ''Hass' avocado on clonal rootstocks after 8 years field production under Phytophthora - free conditions.

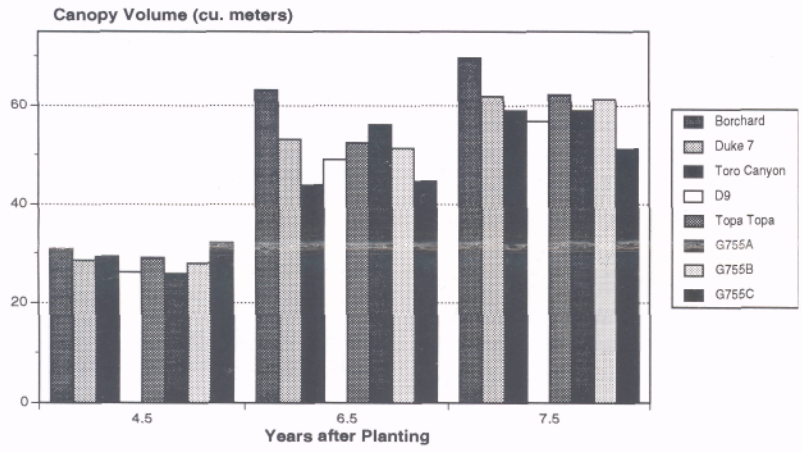


As we reported in the Summer 1993 edition of this newsletter, the Borchard and Duke 7 rootstocks continue to be the highest producing rootstocks in the trial (Figure 1). One should note, however, that the Borchard rootstock is known to be susceptible to

Phytophthora root rot. The Toro Canyon, D9 and Topa Topa rootstocks are producing comparable yields whereas the three G755 rootstocks remain less productive. It is noteworthy that both the Thomas and G1033 rootstocks, although planted one year later than the remaining portion of the trial, have yielded comparable amounts of fruit to the G755 trees.

A component of yield not often considered is year efficiency that is the amount of fruit that is produced for a given volume of tree. Often times, examining data on this basis can provide a different interpretation of productivity trends. Figure *2* illustrates the changes in tree size (as indicated by canopy volume) for the 8 rootstocks planted in 1986. Note that the Borchard rootstock since Year 6.5 has produced the largest tree. Except for the G755C trees, the remaining rootstocks have comparable tree size.

Figure 2. Canopy volume of 'Hass' on clonal rootstocks 4.5, 6.5, & 7.5 years after planting.



Yield efficiency is illustrated in Figure 3. The yield efficiency for 1993 was calculated by dividing the 1993 yield (Year 7) by the 6.5 year canopy volume. The 1994 yield efficiency was calculated by dividing the 1994 yield (Year 8) by the 7.5 year canopy volume. By doing this calculation, a different view of tree productivity is obtained. In 1993, which was an 'on' year, the most productive rootstock was Toro Canyon. Viewed from this perspective, the Borchard, was the least productive of the top 5 rootstocks. Examining yield efficiency also allows us to compare tree productivity between planting years. Note that in 1993; the Thomas rootstock was also highly productive. The yield efficiency in 1994 reflects the alternate bearing characteristics of the 'Hass'. In 1994 the least productive rootstocks were the Toro Canyon and Topa Topa. All other rootstocks were equally efficient in producing fruit.

We have continued to expand this project. In Spring 1993 we established a new root-stock trial that includes: D9, Hibbard (Pauma), UC2011, Queretero, Dusa, and CR1-80, Duke 7 and Thomas. Also included within the planting is the BL-122 on Duke 7. We will

be able to directly compare yield potential of this new variety against the 'Hass' in a controlled setting.

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Figure 3. Yield efficiency of 'Hass' on clonal rootstocks.