

Field Evaluations of Some New Avocado Rootstocks

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In recent years, several new rootstocks have emerged from our research program. These include Thomas, Martin Grande (G755), and Barr Duke (Coffey and Guillemet, 1987). While they may have superior resistance to *Phytophthora* root rot in severe tests (Coffey, 1987,) their long-term performance in California avocado groves has still to be determined.

In the last five years, we have increased this important field phase of our resistant rootstock program. Previously, clonal rootstocks were grown at our greenhouses at the university; but due to physical restraints (greenhouse facilities and personnel), the numbers of trees produced were relatively small. In 1984, we began to establish large plantings of rootstocks grafted with the Hass variety. With the assistance of Brokaw Nursery, we were able, during a single planting season, to plant approximately 2100 trees with 13 different grower cooperators located in the majority of the avocado growing counties.

All of these trees were planted in commercial situations where root rot was present. The majority of the plantings were treated with Ridomil, at label rates, while a few were left untreated. A large number of the smaller plantings suffered from inadequate cultural care, so unfortunately did not yield any useful data. There were, however, two very successful plantings, including one very large planting; and we have chosen to present the preliminary data that they have provided.

The first planting is at the Embarcadero Ranch, which is located in Goleta and managed by John Hunt (Figure 1). There are a total of 712 trees representing 18 different rootstock selections in this planting. The trees were pretreated with Ridomil at the nursery and planted April 6, 1984, on mounds that are approximately 4 feet wide and 18 inches high, in a section of the ranch where two previous plantings of avocados had failed due to root rot. The first year, they were irrigated with one, 1 gallon per hour, drip emitter per tree, for 5 to 8 hours per week depending on the weather. The trees were treated with Ridomil at label rates in May, August, and October, and received fertilizer in April and September. The following year, the number of emitters was increased to three per tree, and the same fungicide and fertilizer schedule was maintained. After the third year, the trees began to show some stress from insufficient water and were switched to mini-sprinklers.

The trees were originally loaded on the truck, at the nursery, in a random order, but unfortunately were not planted in the same random design. This lack of proper randomization has made it impossible to analyze all the data from the entire plot. However, we have been able to select out approximately 200 trees representing five rootstocks that can be analyzed statistically, and we report on them. The girth

measurements of the trunk are taken annually at a point approximately 15 inches above the soil level, and the visual ratings are also taken at this time. These ratings based on a scale of 0 to 10, where 0 = healthy and 10 = dead, are an assessment of the vigor, color, and general health of the tree (Figures 2 and 3).



Figure 1. *A three-year-old Hass on a Thomas rootstock is seen in the middle ground next to Fred Guillemet. In the foreground is a Hass tree on a susceptible rootstock. The Thomas rootstock has performed well from 1984 until now (1989) at the Embarcadero Ranch in Goleta.*

The second planting is at the Betty Spaulding Ranch, in Carpinteria, and is managed by Bob Branstetter (Figure 4). There are a total of 100 trees representing 5 different rootstocks. The trees were pre-treated with Ridomil at the nursery and planted on mounds approximately 4 feet wide and 18 inches high, in an area where the original thirty-year-old avocado trees died from root rot. The planting design was computer randomized, and the trees were planted on April 24, 1984. The first year they were irrigated with one, 1 gallon per hour, drip emitter per tree, for 5 to 10 hours per week depending on the weather. The trees were treated with Ridomil at the label rate in June, September, and November and fertilized in May and August. The following year, the Ridomil treatment was discontinued and the irrigation system was switched to mini-sprinklers.

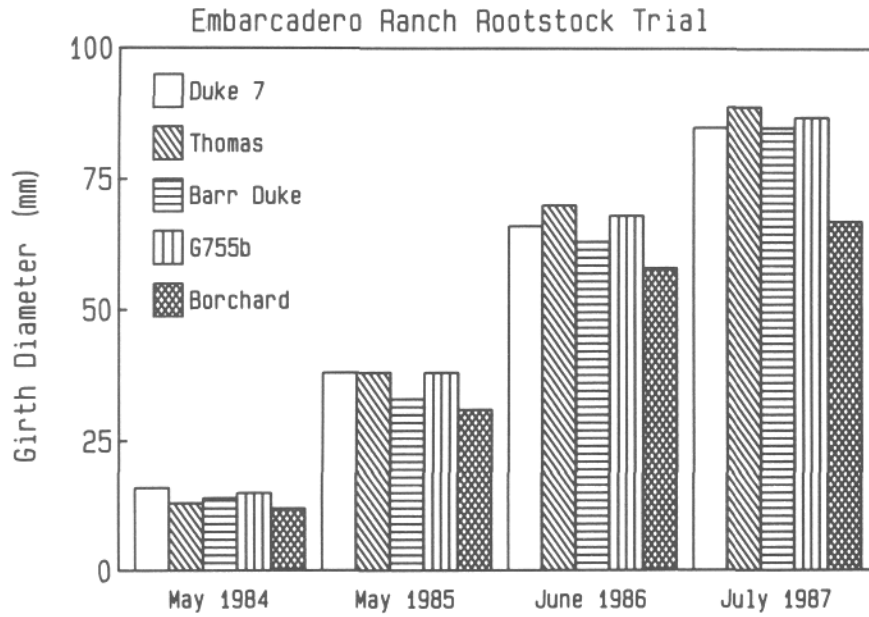


Figure 2. Girth measurements are one reliable indicator of tree performance in a root rot situation. These data are from Embarcadero Ranch, Goleta.

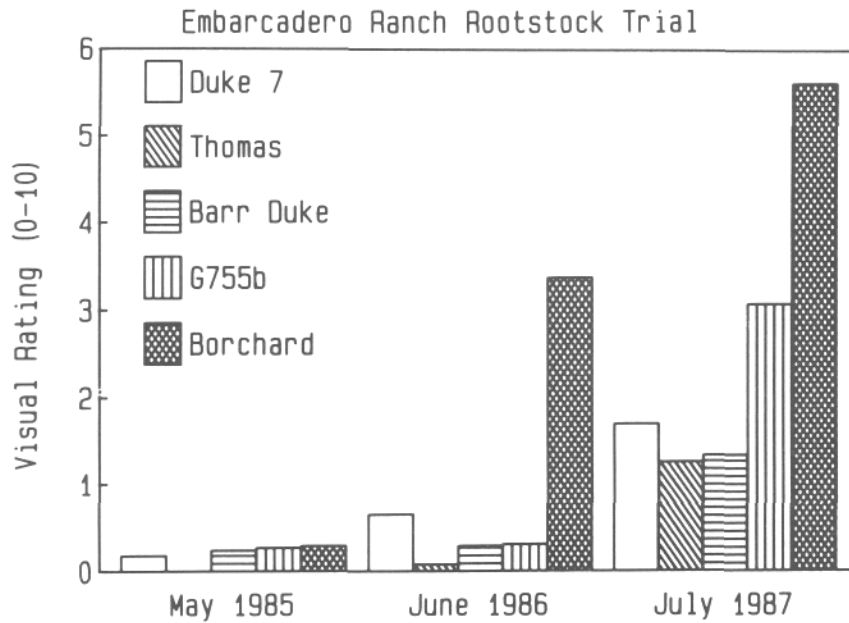


Figure 3. Visual ratings on a scale of 0 to 10, where 0 indicates 100% healthy and 10 equals 100% diseased, provided a dramatic representation of rootstock performance. The data are from Embarcadero Ranch.



Figure 4. *General view of part of 2-year-old planting at the Spaulding Ranch, Carpinteria.*



Figure 5. *A two-year-old Hass on a G755C rootstock at the Spaulding Ranch, Carpinteria.*

Ridomil treatment was resumed again in 1987. The girth measurements of the trunk are taken annually at a point approximately 15 inches above the soil level, and the visual ratings are taken at the same time (Figures 5 and 6).

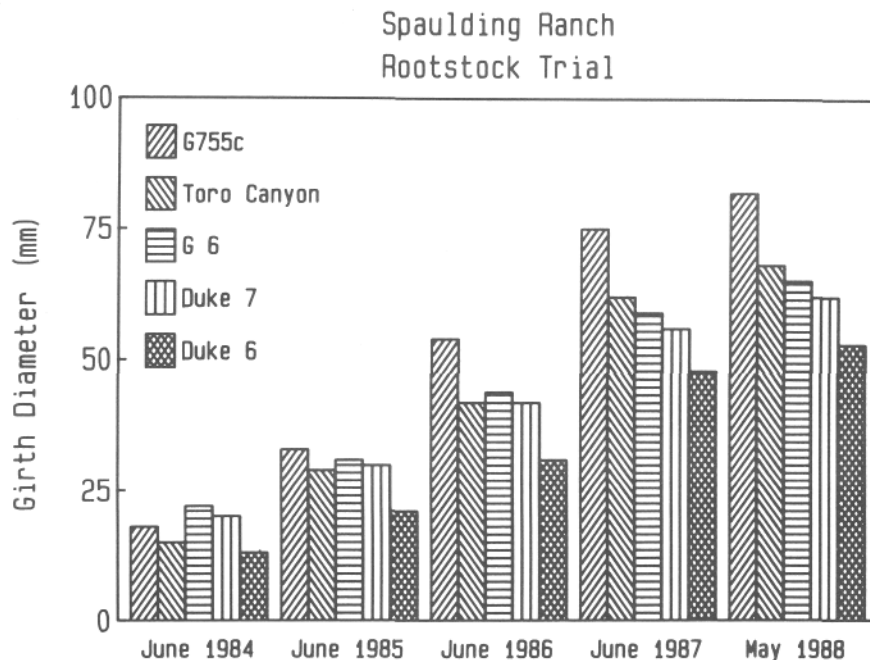


Figure 6. Girth measurements from the planting at the Spaulding Ranch, Carpinteria.

These two plantings are beginning to reveal some interesting findings. The results at the Embarcadero Ranch provide good data on our two new rootstocks, Thomas and Barr Duke (Figures 1, 2 and 3). These two rootstocks are still performing in an outstanding fashion after 4½ years in root rot ground. At the Betty Spaulding Ranch, the Martin Grande (G755C) rootstock (Figure 5) is performing better than the others, based on a combined assessment of trunk girth diameters (Figure 6) and visual ratings (Figure 7). These two plantings should continue to provide us with some critically-needed data, including data on fruit yields, over the next 5 to 10 years. Many more plantings of this type are urgently required in order to evaluate rootstock performance over a sufficient time frame and to permit good reliable yield data to be accumulated. In the final analysis, the only reliable indicator of a rootstock's performance is its ability to sustain good fruit production over many years in different locations in southern California.

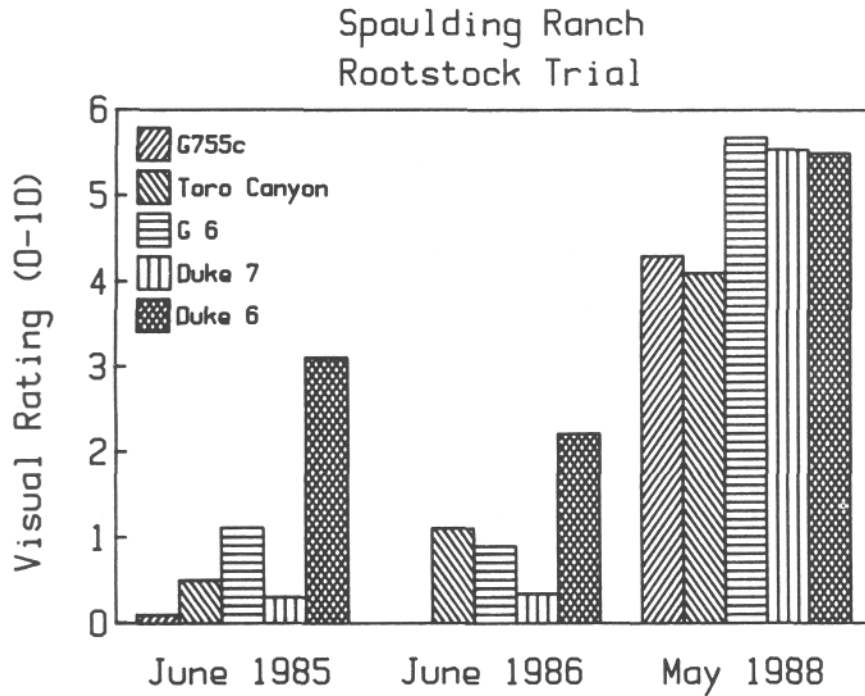


Figure 7. Visual ratings from the Spaulding Ranch.

Currently, there are still no data available on this aspect of rootstock performance in any root rot situations. The two plantings at Carpinteria and Goleta represent the beginnings of this important aspect of root rot research.

Literature Cited

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