

Profiles of UCR Clonal Rootstocks

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Duke Rootstocks

Duke 6 and Duke 7 are two seedlings of the cold-resistant Mexican variety, Duke. They have been selected for their moderate resistance in the field to *Phytophthora cinnamomi*. Both Duke 6 and Duke 7 have performed well in root rot situations, especially as ungrafted trees. Barr Duke is a first generation Duke seedling of Duke 6. It was selected because of its superior performance compared to Duke 6 in a severe root rot situation. Preliminary results from a severe root rot test using grafted Hass trees without fungicides indicate that it may possess, in addition to moderate root rot resistance, useful semi-dwarfing properties. The possibility should be tested that Barr Duke may provide a useful combination with the Gwen variety in dense planting situations, 200-300 trees per acre, where the aim is high productivity in as short a period as possible. UCR 2001 is a first generation seedling of Duke 7. Since the Duke 7 rootstock has proved itself over a 20 year period, further selections such as UCR 2001 are worthy of evaluation.

G6 parent, G6#1

The G6 rootstocks are from Guatemala. However, in horticultural terms they belong to the Mexican race. G6 parent was collected in 1971 on the high slopes of the Acatenango volcano near Antigua in Guatemala. G6 parent is the clone of that original tree. G6 #1 is a seedling selection. At this time, G6 parent appears to be a better rootstock than G6 #1. In our tests, G6 has demonstrated *Phytophthora*-resistance comparable to Duke 7.

Thomas

Thomas was recovered by Fred Guillemet and Frank Koch in spring 1979 from a rootstock of a Fuerte tree growing in Escondido. The tree was a survivor in a root rot area. Thomas is a Mexican type. The first extensive trials of grafted trees were planted for field evaluation in May 1984. Thomas is definitely resistant to *Phytophthora* under field conditions. The level of resistance has yet to be fully assessed; but after 4 years assessment, it would appear to be comparable to rootstocks such as Martin Grande.

Martin Grande

Martin Grande is a market collection of hybrids of avocado and coyou (*Persea americana* x *Persea schiedeana*) made in Coban, Guatemala, in 1975. There are three seedlings of Martin Grande available. These are currently designated G755a, G755b, and G755c. The collection of Martin Grande was initially screened for resistance in March 1976. The first ungrafted trees were field tested in 1979, and the first grafted trees of the G755b and G755c were planted in small quantities in May 1983 at

Fallbrook, San Diego county. All three selections (a, b, and c) were planted in larger numbers in May 1984. The results of this 4 year test program indicate that G755a, G755b, and G755c are resistant to *Phytophthora*. No consistent differences between the three selections have been observed in our program. One interesting feature of the Martin Grande series is their similar field performance both as grafted and ungrafted trees. In contrast, rootstocks such as Duke 6 and Duke 7 performed less well in the grafted state. G755 has been named Martin Grande, after Martin Cumes S., who was killed in 1981. Martin was responsible, with Eugenio Schieber, for making many of the earlier collections from Guatemala of avocado and coyote, including G755, which were subsequently tested for *Phytophthora* resistance at UCR. Martin Grande has generally proved more easy to establish in root rot situations than either Duke 7 or G6. We have been told that there have been limited failures of G755 when planted in some alkaline soils. We are investigating this phenomenon.

G1033

G1033 is our code for a seedling of the Guatemalan variety Hayes, selected in Hawaii by Prof. Hamilton and stated to have some *Phytophthora*-resistance. It is under evaluation as a resistant rootstock in California. Early results with grafted Hass trees have not been promising. However, field tests to date have been very limited. It does seem to display good vigor and very little tipburn when grown as an ungrafted tree in heavy clay soils under salt stress conditions.

UCR 2010

UCR 2010 is a Guatemalan seedling collected near Solola in the Guatemalan Highlands. It has demonstrated resistance to *Phytophthora* in an ungrafted state.

OTHER SELECTIONS

Four other rootstock selections are also undergoing initial testing, and these are:

UCR 2002

UCR 2009

UCR 2011

UCR 2014

Information on these four selections is minimal at this time.

STATUS OF ROOTSTOCK EVALUATIONS

In initial tests, rootstock selections are evaluated in an *ungrafted* condition. If they do show promise, they are then tested in a *grafted* condition with a scion variety such as Hass. Performance in a grafted condition may differ markedly from that of an ungrafted tree. The most promising rootstocks showing useful resistance to *Phytophthora cinnamomi* in a grafted state with Hass are Martin Grande (G755a, G755b, G755c) and Thomas. Since large scale testing of these new rootstocks only began in 1984, we have yet to obtain any figures on fruit production under root rot conditions. Equivalent figures on tree production in root rot-free conditions are not available, either. Initial data on production potential should begin to accumulate from 1989-90.