

History of the Martin Grande Rootstock

George A. Zentmyer¹, Eugenio Schieber², and Fred B. Guillemet¹—

¹University of California, Riverside, ²Antigua, Guatemala.

There have been many questions and considerable unawareness about the origin of the avocado rootstock now known as Martin Grande (originally designated G755A, B, and C). This article provides information on the history of this unique and very promising rootstock from the standpoint of resistance to *Phytophthora* root rot.

The seeds that became Guatemalan collection G755, and later "Martin Grande," were collected in a native market in Coban, Alta Verapaz, Guatemala in September 1975. The fruit were said to have come from San Juan Chamelco, a village northeast of Coban. The collection was made by Eugenio Schieber and his Mayan assistants, Martin Cumes Sajvin and Martin Cumes Morales, natives of Santa Catarina, Solola, Guatemala. Schieber, in his notes sent to the first author after the collection, described the fruit as follows: "Coyou from Coban market. Very long necked, brown color fruit, irregular skin. Brown chocolate flesh. Long pointed seed." "Coyou" or "chucte" are names given by the Guatemalan natives to fruit of the species of *Persea* (*P. schiedeana*) related to the avocado (*P. americana*).

Ten seeds from this G755 collection were sent to Riverside in October 1975. These were planted in the greenhouse at UCR by Fred Guillemet in December 1975; six seeds germinated. In February 1976, four of the seedlings were tested in the severe nutrient tank test method that we then used. All of these seedlings showed some resistance to *Phytophthora cinnamomi*, much more than the standard test seedlings, Topa Topa, and were transplanted into naturally infested soil in the greenhouse. The one seedling with the highest resistance was labeled G755C, and was the source of all subsequent G755C clonal trees.

The first reports of this collection appeared in the California Avocado Society Yearbook in 1977 (Schieber and Zentmyer, 1977; Zentmyer *et al.*, 1977). In an article on collections of *Persea schiedeana* in Guatemala, Schieber and Zentmyer mentioned this collection as a possible hybrid. The other article by Zentmyer, Guillemet, Harjung, and Zaki on resistance to *Phytophthora* root rot provided the first report indicating resistance in the G755 collection and commented that "it appears to be a hybrid," and "is graft compatible with avocado."



Fig. 1. Martin Grande (right) and Martincito (left) preparing lunch on one of our exploring trips in western Guatemala. Photo by Schieber.



Fig. 2. George Zentmyer and Fred Guillemet observing the Martin Grande rootstock at the Riverside greenhouse (1978). Photo by Schieber, 1978.



Fig 3. Martin Grande rootstock growing in a nursery in South Africa.



Fig 4. Martin Grande (left) and Martincito on shore of Lake Atitlan (1980).

When the initial tests of the G755 seedlings indicated an unusual degree of resistance, we labeled the remaining two seedlings that had not been tested G755A and G755B. These were the sources for subsequent G755A and G755B clones.

G755A, B, and C seedlings were then used for propagating rooted cuttings for further greenhouse tests for root rot resistance and for field testing in various groves in southern California. Initial field plantings were made in May 1979 on the Orville Taylor

property in Camarillo, in June 1979 on the Barr grove in Fallbrook, and in August 1979 on the Don Petty grove in Carpinteria. The first two plantings involved ungrafted trees. The first grafted trees, Hass on G755, were planted on the Petty property in August 1979.

Propagation by Fred Guillemet soon showed that G755 was graft compatible with the avocado, using Hass and Fuerte scions. Earlier reports of compatibility of *P. schiedeana* and *P. americana* had indicated somewhat variable results. Dr. Wilson Popenoe planted avocado trees grafted on *P. schiedeana* rootstock in an experimental planting on Mt. Uyuca, above the Escuela Agrícola Panamericana at Zamorano, Honduras in the early 1950s. I (GAZ) saw these trees in 1952; they were making very poor growth, with constricted trunks above the bud union and enlarged rootstocks. However, in South Africa (Schroeder, 1973-74), reported that trees grafted on *P. schiedeana* rootstock were very vigorous. These trees originated from budwood sent to South Africa by Schroeder from *P. schiedeana* trees in the planting at UCLA; this material originally came from Guatemala.

The southern California field plantings of G755 in the late 1970s and early 1980s showed early indication of tolerance or resistance, and generally were strikingly vigorous.

The foliage of the G755 original seedlings and subsequent cuttings was somewhat different from foliage of typical *P. schiedeana* trees as we have observed them in various regions of Mexico, Guatemala, Honduras, and Costa Rica in the 1950s, 1960s and 1970s. Leaves were similar in size and shape, but were not as coarse or as pubescent as typical *P. schiedeana* leaves. However, new shoots of G755 show some pubescence. The second author, during a visit to the greenhouses at Riverside in 1979, noted with the other authors that the G755 seedlings were not typical of *P. schiedeana*, so we suggested that G755 was a hybrid. In a letter to George Zentmyer in 1985, Eugenio Schieber stressed that the parentage of G755 must have been *P. schiedeana* x *P. americana* var. *guatemalensis*, because there are no West Indian avocados in the north Central Departments (Provinces) of Guatemala. Subsequent isozyme analyses by Ellstrand *et al.* (1986) have shown that G755 definitely has characters from both species (*P. schiedeana* and *P. americana* var. *guatemalensis*).

In September 1976, indicating the significance that at that early date we placed on the G755 collection, the first author wrote E. Schieber suggesting that he collect "additional chucte seeds from the Coban market. Also be on the lookout for trees in that region that may be hybrids between *P. americana* var. *guatemalensis* and *P. schiedeana*.

Since M. D. Coffey took over the avocado program in 1982, many additional propagations have been made using the G755 rootstocks (A, B, and C) and field plantings have increased greatly. Many of the trials have shown that G755 is indeed an interesting rootstock with significant resistance to root rot. Additional trials are needed to test production capabilities and to determine the effect of various environmental and nutritional conditions on growth and productivity of trees grafted on Martin Grande.

The name Martin Grande was finally assigned to G755 in 1987 (Coffey, 1987; Schieber and Zentmyer, 1987) following a suggestion by the second author. The name honors the Guatemalan native Martin Cumes Sajvin, who was tragically killed in September

1981. The second author had two native assistants named Martin Cumes who were not related; the larger one was called "Martin Grande," and the smaller, Martin Cumes Morales, is known as "Martincito". The latter is still involved in the avocado collecting program in Guatemala, as he has been since 1975.

We feel that the spread around the world (to Israel, Australia, South Africa for example) of the Martin Grande rootstock, as well as other selections from Riverside (Duke 7, G6) has made a significant contribution from the UC Riverside program to other regions around the globe.

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