

SELF-POLLINATED FUERTE SEEDLINGS

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The Fuerte variety ("cultivar") has dominated the California avocado industry to a striking degree. For a remarkable three decades, until a few years ago, we had about twice as many acres planted to Fuertes as to all our other varieties combined.

It has been the preeminent variety also in most other regions of the avocado world with environmental conditions roughly comparable to our "Mediterranean" climate. So the fruit preference of European purchasers, for example, has been largely determined by the Fuerte standard (Bergh, 1975). It is still the best all-around variety for Israeli growers (S. Gazit, private communication).

The reasons for this Fuerte dominance are not hard to find. Coit (1968) described the variety well:

"The Tree: Vigorous grower, spreading in stature, relatively frost resistant. When not too crowded, it is easier and cheaper to harvest. Buds are large, plump and take well on nursery rootstocks. Budded Fuerte nursery trees are cheaper to grow than the Hass variety.

The Fruit: Marketable size, an attractive green color, oil content ideal, flavor excellent, unique and long season, December to April, avoids competition with most other fruits and vegetables. The skin peels readily during mid-season. Easy to tell by gentle pressure when ready to eat . . . endures picking, hauling, packing, cold storage and transportation . . ."

No wonder the Fuerte achieved such prominence, in California and elsewhere.

But alas! Its fatal flaw has long been evident: inconsistent production, with too low an average yield in most years. As a result, Hass is now rapidly passing it as the leading California variety.

The decline of Fuerte acreage is being viewed with alarm from our marketing standpoint (Coit, 1968). One solution being tried is the selection of superior Fuerte bud sports, and rootstock combinations.

Another possible solution is the breeding of Fuerte-like substitutes. Nearly 30 years ago, the late Professor Robert Hodgson (1947) saw both the problem and this possible answer to it. He wrote, "For some years past, it has become increasingly clear that in the search for new and better varieties, the California avocado industry would "do well to capitalize on the enviable reputation in the markets established by its major variety, Fuerte. This could be accomplished by ... developing varieties of similar fruit characters but better bearing behavior [by a] breeding program . . . The appearance and behavior

of certain Fuerte seedlings suggests the practicality of attaining this objective . . ."

This article will assess Hodgson's hopes in the light of the actual breeding results that have since been obtained.

Self-pollination has a major advantage over hybridization in that the former provides an efficient test of a variety's breeding worth (Bergh, 1975). We recently illustrated the superior genetic potentials of the Hass (Bergh and Whitsell, 1974). We harvested selfed Fuerte trees also, to produce some 470 seedling progeny. They were grown in Field No. 5 of the South Coast Field Station, and at the Limoneira Company in Ventura County.

They proved to be the poorest quality of any seedling group that we have ever grown. The great majority never fruited. Of those that did fruit, practically all were utterly useless—as the following pictures illustrate.

Again alas! Hodgson's hopes have faded away. If the problem of Fuerte decline is to be solved, it will not be by progeny of that variety.

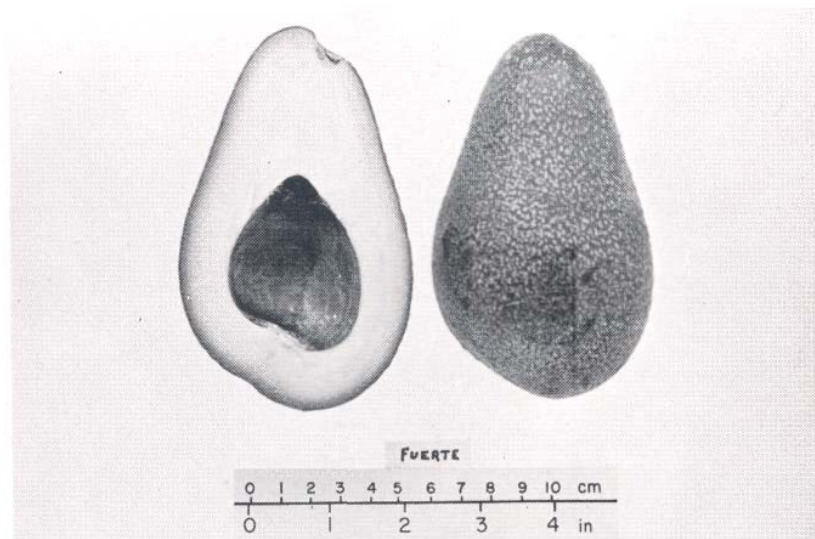


Figure 1. The Fuerte, for decades the standard of excellence among California varieties.

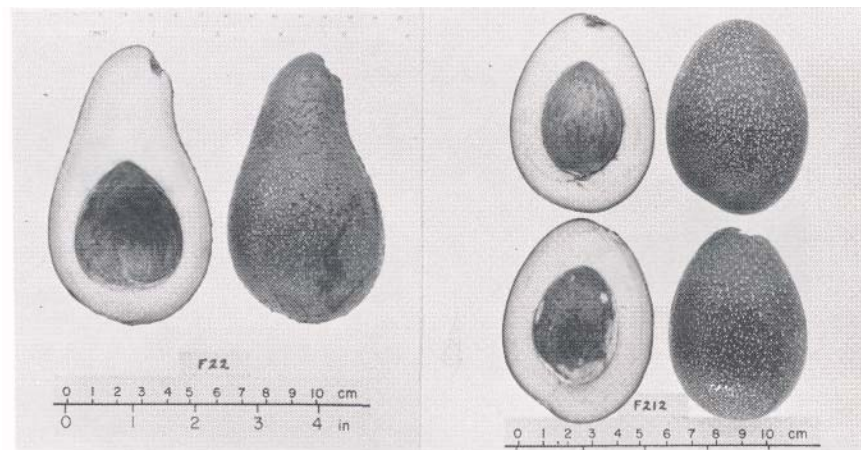


Figure 2. A tiny proportion of Fuerte seedlings had fruits of fair quality. The fruit to the left is from a tree that rarely set anything. The fruit to the right has a beautiful surface; it is too small, and the tree produced mostly cukes. It was perhaps the most Mexican-like of these progeny: mature about November, with a thin skin.

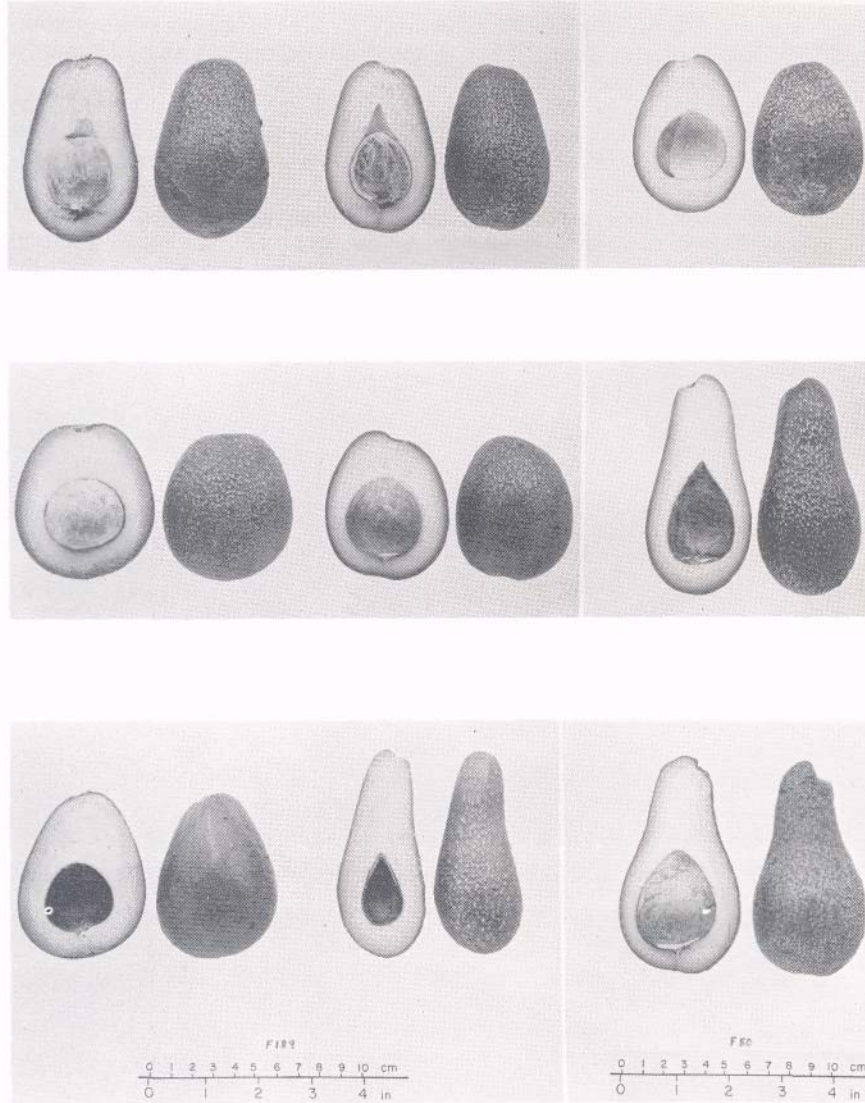


Figure 3. The fruit of nearly all Fuerte seedlings was too small. Top row right has a thicker skin than Fuerte, but it russeted severely. Bottom row left illustrates the great fruit variability on some trees.

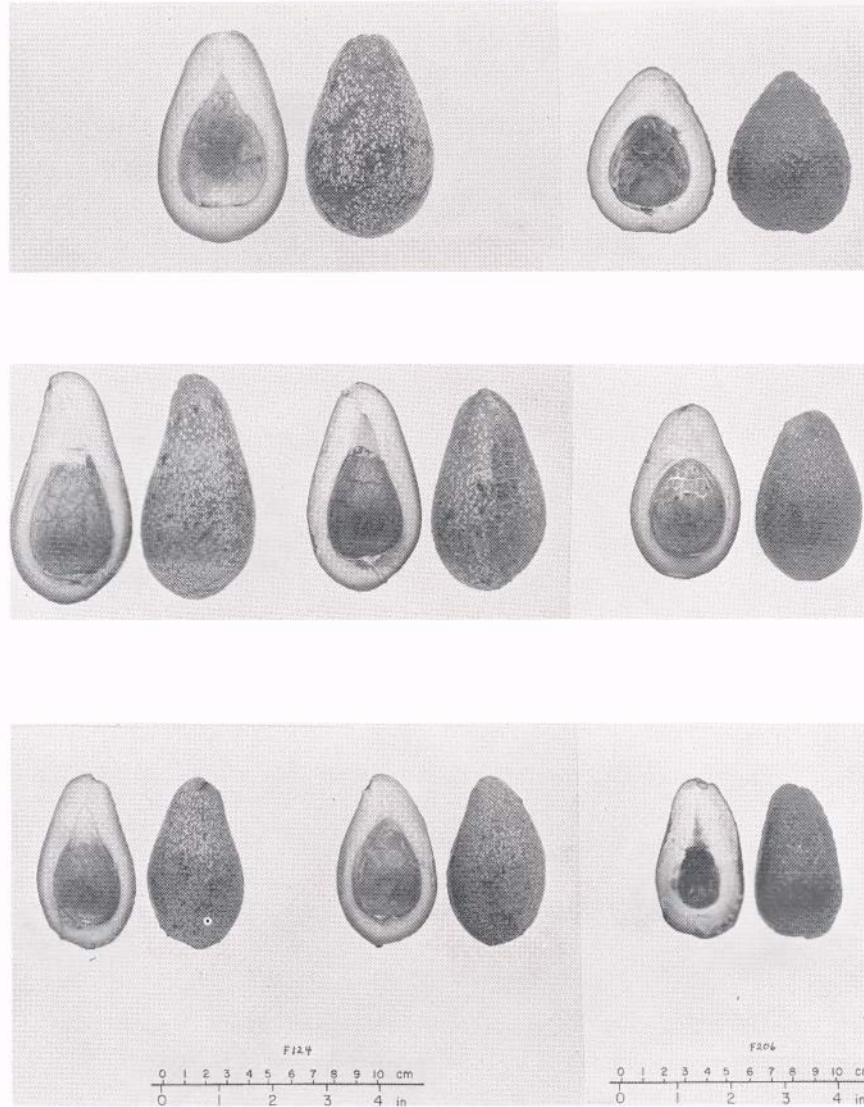


Figure 4. Many had fruits that were both too small and too large-seeded. And the seed cavity sometimes extended above the seed, as in the three seedlings shown to the left. The upper row left seedling set only two fruits, but they hung on to July and still looked fairly good. Lower row right: even with a small seed, the cavity sometimes extended upward; this seedling had severe end breakdown by maturity.

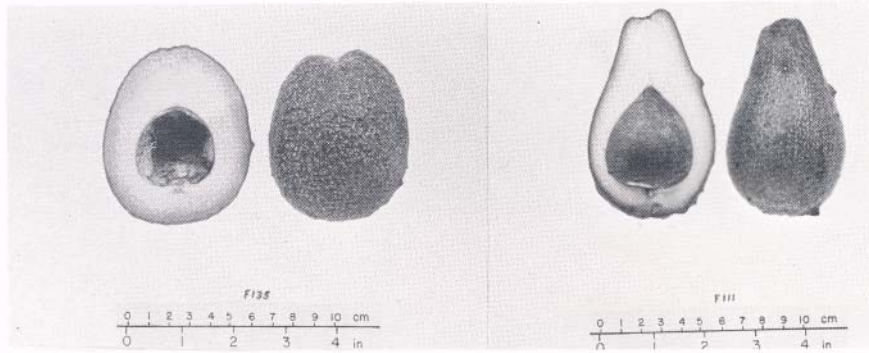
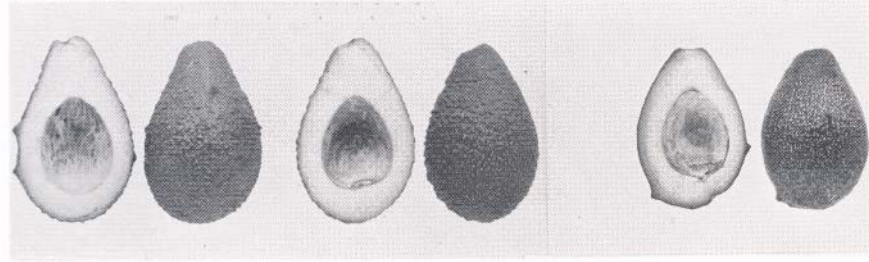


Figure 5. Many produced warty fruits. The upper left was the most Guatemalan-like segregant of all these Fuerte progeny: season, May to August; thick, pebbled skin. It set a total of three fruits. Lower left: while sometimes more warty than shown, this was rated the best seedling of the lot: size, adequate when fully mature; season, February to July; attractive; good set.

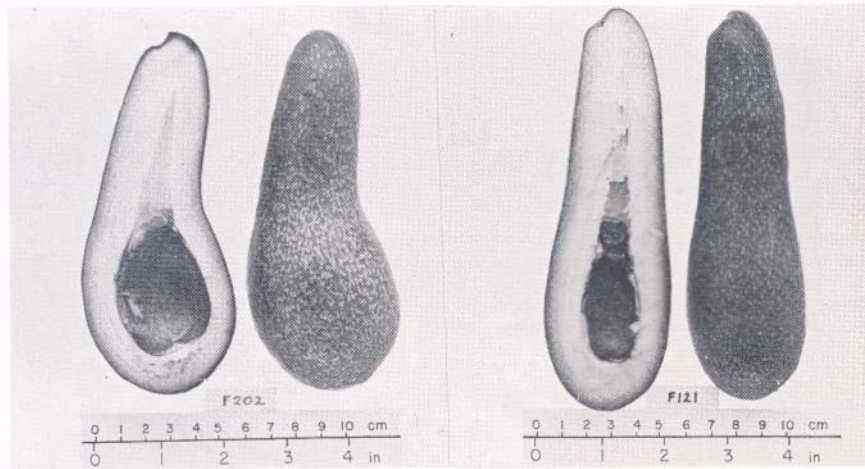


Figure 6. Elongate fruits with more elongate seed cavities.

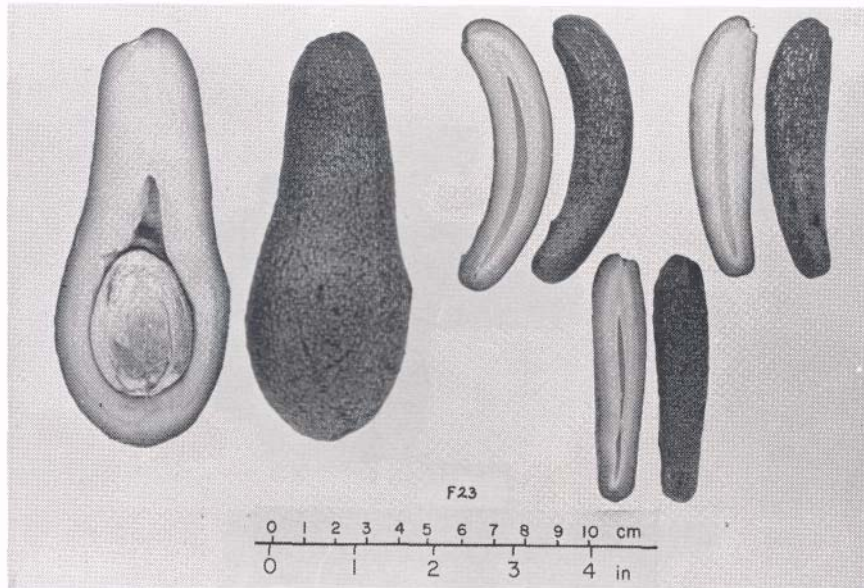
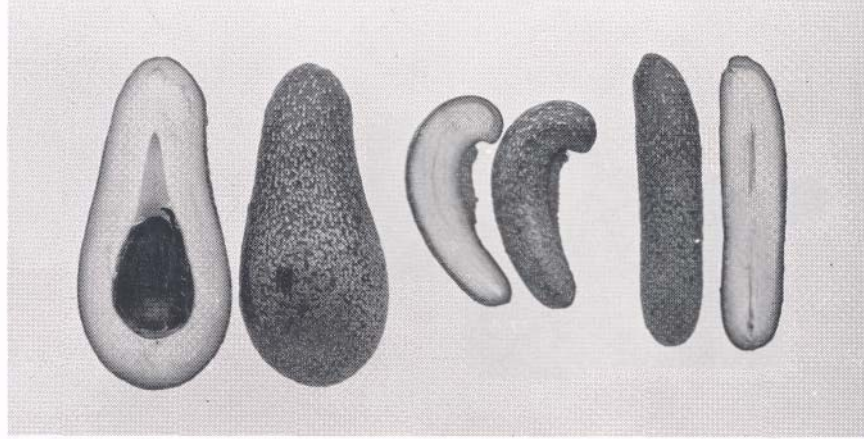


Figure 7. Many produced mostly cukes. These accentuate any tendency of normal fruit on that tree to elongate shape and cavity extension.

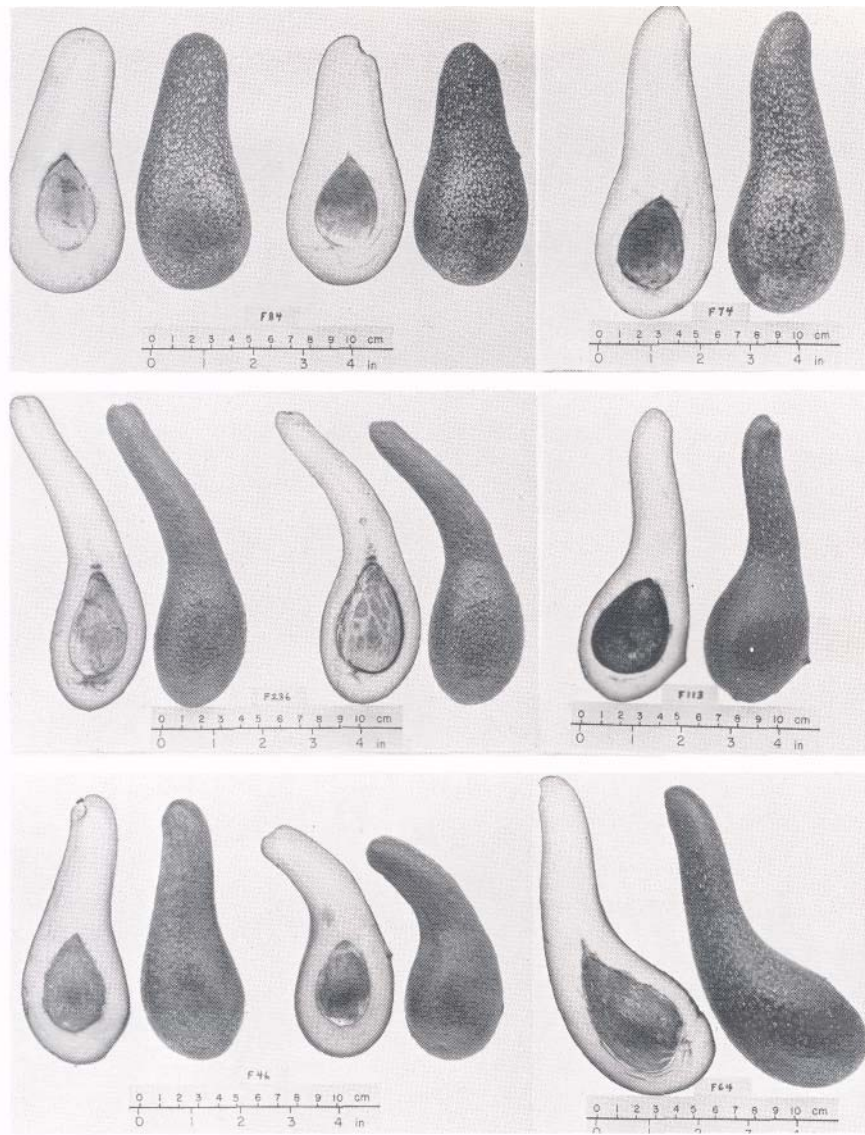


Figure 8. The fruit of most Fuerte seedlings was too slender. The only ones with fruit as large as the parent, had elongated freaks!

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