

1984 NC-140 Peach Rootstock Trial  
Final Report (1990)

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Over the past 7 years, this trial has provided some useful information for researchers and growers in California. Initially, our main interest was in dwarfing rootstocks, but we have also followed up on certain aspects of nematode resistance, water relations, and nutritional disorders.

Dwarfing Rootstocks

For the first few years of the experiment, Citation appeared to be an excellent dwarfing rootstock. It produced a very small tree with good yield for its size and large sized fruit. However, within a few years trees began to collapse and by the seventh year 5 of the original 11 trees had died. Several more are currently very unhealthy and would probably not last much longer. It is interesting to note, however, that 2 or 3 trees still look very healthy and make an ideal looking dwarf tree. It would be very valuable to know the difference between these trees and the ones that died.

GF 655-2 also looked promising initially as a dwarfing rootstock. It produced a tree similar in size to Citation (Table 1), but continued to look healthy for the course of the experiment. Only one tree out of 11 has died. However, from the beginning, fruit size has been somewhat smaller than that produced on trees with standard rootstocks (Table 2). An evaluation of the water relations of these trees showed GF 655-2 was more stressed than standard rootstocks (lower conductance and leaf water potential) at the end of a normal irrigation cycle. It was felt that this might be part of the explanation for smaller fruit size. Therefore, further evaluation was made by planting trees on this

rootstock in an orchard under a high frequency, low volume irrigation system. The trees are only 3 years old but results so far show no improvement in fruit size.

Damas 1869 was the final dwarfing rootstock that was evaluated in this trial. Initially, it grew as vigorously as trees on standard rootstocks. In subsequent year, it slowed down substantially and now has a trunk circumference about 70-75% of standard rootstocks (Table 1). Unfortunately, fruit size showed the same pattern and has been quite small the last 2 years. Another serious problem with this rootstock has been extensive root suckering (Table 2).

### Vigorous Rootstocks

Most of the other rootstocks in the trial have produced vigorous trees of about the same size as Nemaguard or Lovell. Yield and fruit size have also been similar although Nemaguard has had the largest fruit in the block every year of the experiment. None of the rootstocks have shown any superiority to Nemaguard, the standard rootstock in California.

A few of the rootstocks might be useful for certain specific applications. GF 677 produced an extremely vigorous tree, significantly larger than Nemaguard (Table 1). Generally, it would be too vigorous for most sites in California. However, on very weak soils or in replant situations, it could be useful. It is also reported to be resistant to iron chlorosis. We are currently testing it on a high calcareous soil to see if it performs better than Nemaguard.

The own-rooted Redhaven were also of interest because of the potential for producing a less expensive tree. It has been encouraging that these trees have grown vigorously with normal yields and fruit size (Tables 1 & 2). Also, nematode samples taken at the end of the experiment indicated quite low populations. Both lesion and root knot nematode populations were higher than in Nemaguard, but had not reached damaging levels. It should be pointed out, however, that this soil has not been very conducive to root knot nematode proliferation in the past.

One final note on this block. California is currently heading into the fifth year of a drought. Since some of these rootstocks have been reported to be drought tolerant, the final year of the trial will be an evaluation of how well the trees survive with no irrigations.

Table 1. Trunk circumference and yield of Redhaven peaches grown on 10 different rootstocks in the 1984 NC-140 peach rootstock trial.

	Trunk circumference (cm)	Yield kg/Tree					Cumulative	% Harvested in first pick	
		1986	1987	1988	1989	1990		1989	1990
Own	41.8 c	25.9	63.0	58.6	105.0	98.3	350.8	22	41
Halford	46.2 ab	25.8	63.4	52.4	98.3	95.1	335.0	14	31
Siberian C	41.5 c	24.6	57.9	56.3	85.7	77.4	301.9	24	55
Bailey	41.4 c	26.9	57.2	43.0	80.6	73.3	281.0	14	36
GF-667	47.5 a	22.7	63.3	58.0	104.3	85.2	333.5	8	31
GF-655-2	20.2 e	8.3	9.4	11.0	14.3	15.7	58.7	20	23
Damas 1869	32.0 d	19.9	30.2	27.7	41.4	41.6	160.8	21	30
Lovell	43.0 bc	19.6	56.4	54.3	101.1	81.5	312.9	6	19
Citation	18.8 e	4.8	8.0	7.8	12.0	11.6	44.2	34	37
Nemaguard	42.7 c	15.2	59.2	54.4	98.3	80.4	307.5	9	15

Table 2. Mean fruit weight, root suckers, and survival of Redhaven peaches grown on 10 different rootstocks in the 1984 NC-140 peach rootstock trial.

	Mean Fruit Wt (g)					Average	Root suckers (#/tree)	Survival (%)
	<u>1986</u>	<u>1987</u>	<u>1988</u>	<u>1989</u>	<u>1990</u>			
Own	139	145	186	140	172	156	0	100
Halford	126	143	181	137	167	151	0	100
Siberian C	148	141	178	127	174	154	1	100
Bailey	137	139	190	136	167	154	0	100
GF-667	122	142	185	127	166	148	0	100
GF-655-2	128	120	128	110	130	123	2	100
Damas 1869	137	124	162	104	137	133	64	100
Lovell	147	155	185	141	171	160	0	100
Citation	155	148	98	128	138	133	0	60
Nemaguard	163	158	192	144	181	168	0	100