Harmony, a New Nematode and Phylloxera Resistant Rootstock for Vinifera Grape

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Harmony, a new vinifera grape rootstock, was recently released by the Crops Research Division, Agricultural Research Service of the U. S. Department of Agriculture.

Harmony rootstock (tested as US 16-154) resulted from a cross, made in 1955 at the U. S. Horticultural Field Station, Fresno, California, between a selected seedling of Solonis x Othello 1613 and a selected seedling of Dog Ridge. In breeding new rootstocks, it seemed desirable to combine the best characters of 1613, the leading currently used rootknot nematode resistant rootstock, with the greater nematode resistance of Dog Ridge (*V. champini*).

The 1613 rootstock on lighter, less fertile soils often lacks adequate vigor and nematode resistance. Dog Ridge on the other hand has adequate resistance, but has too much vigor, adversely reducing yields and fruit quality. An intermediate type rootstock was desired. However, both 1613 and Dog Ridge bear pistillate type flowers and their hybridization was impractical. Elmer Snyder and Frank Harmon had previously selected several seedlings of 1613 and Dog Ridge for their resistance to rootknot nematodes. Two of these were outstanding, a pistillate selection of 1613 (#39) and a staminate selection of Dog Ridge (#5). These two selections were used as parents for the initial cross in 1955. The following year other crosses were made, also using Riparia Gloire, Mourvedre x Rupestris 1202, Rupestris x Berlandieri 57R, and certain 1613 selections as parents. A total of nearly 1200 seedlings were grown and tested, and the final selection of Harmony was made in 1965.

More than half the seedlings were eliminated in the first rootknot nematode test in the greenhouse, before planting in the field. Field inoculations eliminated additional susceptible ones the following winter. Cuttings planted the next season in phylloxera infested soil permitted selection for phylloxera resistance, as well as rootability and vigor. Bench-grafting tests indicated the adaptability of selections to this easy method of propagation.[1] Generally, selections which callused rapidly and rooted readily succeeded best in bench-grafting. Some rootstock selections caused an undesirable bulge at the graft union, and these selections were discarded. Additional discards were made if growth characteristics such as short internodes or excessive branching on canes would provide too few cuttings per vine for efficient propagation. In all considerations Harmony ranked among the leaders.

The final test of any rootstock is its effect on fruit production. Comparisons of Harmony with 1613 and own-rooted vines were made in cooperative tests with several California Farm Advisors and growers. Thompson Seedless and Emperor varieties were used as scion varieties principally because they are the predominating varieties in the area. Table I gives the growth

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[1]Harmon, F. N., and J. H. Weinberger, 1963. Bench grafting trials with Thompson Seedless grape on various rootstocks. Proc. Amer. Soc. Hort. Sci. 83:379-383.

TABLE 1. Comparison of nematode and phylloxera resistance yield and vigor between Harmony, 1613 and own-rooted vines of Thompson Seedless and Emperor.

Test No.	Stock	No. vines	Nematodes 0-5 (max.)	Phylloxera 0-5 (max.)	Yield	Trunk circumference cm.
Thompson Seedless						
1	Harmony	10	0.1	0.0	51.7 cl.	16.4
	1613	14	2.3	0.0	16.3 cl.	9.2
	Own root	9	3.5	0.0	22.4 cl.	8.9
2	Harmony	15	0.6	0.0	69.8 lbs.	19.1
	1613	15	1.8	0.0	45.4 lbs.	14.3
	Own root	14	2.9	0.0	48.3 lbs.	12.1
3	Harmony	5	0.0	0.0	38.2 cl.	
	Own root	3	0.0	4.0	27.5 cl.	
4	Harmony	14	0.0	0.0	25.8 cl.	18.8
	Own root	10	0.0	0.0	18.0 cl.	16.0
5	Harmony	29	0.0	0.0	31.0 cl.	7.3
	1613	28	0.1	0.0	26.0 cl.	7.6
	Own root	28	1.3	0.0	19.0 cl.	4.9
Emperor						
6	Harmony	9	0.0	0.0	32.4 cl.	19.1
	1613	17	0.3	0.0	31.8 cl.	19.6
	Own root	10	0.3	0.0	22.1 cl.	20.8
	Harmony	8	0.0	0.0	26.9 lbs.	15.2
	1613	10	0.0	0.0	21.3 lbs.	14.6
8	Harmony	10	0.0	0.0	43.8 lbs.	14.2
	1613	10	0.0	0.0	41.2 lbs.	14.2

and yield comparisons, together with nematode and phylloxera ratings made on the larger test plantings. Harmony was more resistant than 1613 to rootknot nematodes in each test where rootknot nematodes were present. Phylloxera were found only in test No. 3, where they seriously stunted own-rooted vines. Harmony was not affected. Yield of fruit was rated by cluster count, or in a few cases, by actual fruit weight. Fruit yield was equal to or greater on Harmony rootstock than on 1613 or own roots in all tests. Differences were greater where nematodes or phylloxera affected 1613 vines. Thompson vines on Harmony tended to overbear in fertile soils, throwing the vines into biennial production. Careful pruning and thinning could control this tendency. Vines on Harmony outgrew those on 1613 and own-rooted stock wherever nematodes were a problem. Harmony was not immune to either rootknot nematodes or phylloxera, but only resistant. Whenever these pests were present, the Harmony root systems were not seriously damaged.

The effect of rootstocks on fruit quality was difficult to determine. In one season there were no measurable differences in cluster size and compactness of Thompson Seedless between vines on Harmony, 1613, and own-rooted vines. With Emperor the color of the fruit seemed slightly darker and duller on both Harmony and 1613 than on own-rooted vines. Currently, Harmony is recommended only for grapes grown for raisin and wine production. Until further infor-

mation is available, the use of Harmony for table grapes is not recommended except when the presence of nematodes or phylloxera prevents the use of own-rooted vines.

Harmony appears to resemble most closely a *V. champini—V. riparia* hybrid, and bears little resemblance to 1613. The leaf has the shape or conformity of *champini,* but the petiole is longer, more like *riparia.* The serrations are smaller than those of *riparia,* but the blade has larger lobes. The sinus opening in Harmony leaves is semi-closed, unlike the open sinus of *champini* and *riparia.* Here the *V. longi* (1613) ancestry in Harmony is apparent. The lower leaf surface has smoother venation than Dog Ridge, and resembles *riparia* in this respect. The petioles of Harmony have less cottony growth or pubescence on them than *champini* petioles, but slightly more than *riparia.* The flowers have reflex stamens. The cane growth is not as "ropy" as *riparia* growth, and resembles *champini* in this regard. In many respects, except for being less vigorous, Harmony most closely resembles the "Salt Creek" rootstock of the University of California.

The Granny Smith Apple

We were told that the Granny Smith apple was named after an elderly lady near Sydney, Australia, on whose property the apple was first grown. It is undoubtedly a seedling, as are most of our important varieties of today.

Being a green apple, the Granny Smith got off to a slow start when a few growers planted it. Nurserymen first recognized the fine quality of the apple, but did not get much response from growers and marketers.

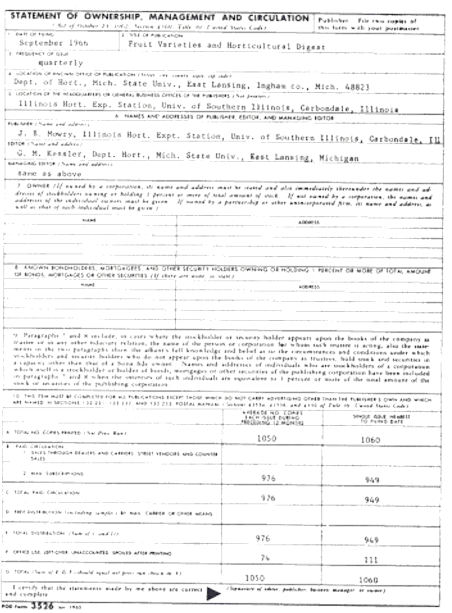
As time went on it was learned that the Granny Smith apple had very few growing faults, and was an apple that was acceptable in the English market. Now it is one of the most important varieties in the Southern Hemisphere.

In answer to the question, "Why is it not grown in the Northern Hemisphere," a number of answers have been given. Some say it is adapted to a mild long growing season which seldom exists in the northern climes.

In Australia and New Zealand you now see Golden Delicious and Granny Smith growing side by side in many orchards. Wouldn't this indicate that areas that really grow a good Golden in the western United States might grow a fine Granny Smith as well? I think so.—*W. A. Luce, Yakima, Wash.*

Peaches in Texas

Leading Texas peach growers have recently indicated that Loring and Redskin head their list. They also rate Ranger high where winters are cold enough to meet its chilling requirement. Keystone is popular in the southern peach belt of Texas.



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