

Performance of the V Series Apple Rootstocks During Six Growing Seasons

Wesley Autio and James Krupa

Department of Plant & Soil Sciences, University of Massachusetts

The Vineland (V) series of apple rootstocks was from open pollinated seeds from Kerr applecrab (a cross between Dolgo crabapple and Haralson apple). Dr. Aleck Hutchinson collected seeds from 1957 through 1960. Trees were planted in Vineland, Ontario, and seedlings were selected based on the potential for dwarfing, hardiness, ease of propagation, and field resistance to powdery mildew, fireblight, and wooly apple aphid. By 1971, when the rootstock breeding project was terminated in Vineland, seven clones (V.1, V.2, V.3, V.4, V.5, V.6, and V.7) had been selected. The first evaluation of these clones as rootstocks began with a trial in 1974. In these early evaluations, V.1 and V.3 were determined to produce trees similar to M.9 in size, V.2 produced M.26-sized trees, and V.4 resulted in trees similar in size to those on M.7. The Vineland rootstocks were almost forgotten for a number of years, but interest was rekindled in the early-mid 1990s. V.1 and V.3 were

included in NC-140 trials, a New England/Nova Scotia trial, and a Northeastern U.S. trial. (For more details of the history of the Vineland series, see the following article: Elfving, D.C., I. Schecter, and A. Hutchinson. 1993. The history of the Vineland (V.) apple rootstocks. *Fruit Varieties Journal* 47:52-58.)

To study performance of the V rootstocks under Massachusetts conditions, a small trial was established in 1996 at the University of Massachusetts Cold Spring Orchard Research & Education Center in Belchertown, including Rogers Red McIntosh on V.1, V.2, V.3, V.4, V.7, and M.26 EMLA. Trees were individually staked and generally maintained as slender spindles. Each year, trunk circumference was measured and total yield was assessed.

After six growing seasons, dramatic differences in tree size existed. Trees on V.4 were more than twice as large as the next largest trees (Table 1). Under our conditions, these trees likely would be larger than

Table 1. Performance of Rogers Red McIntosh apple trees on several rootstocks planted in 1996 at the University of Massachusetts Cold Spring Orchard Research & Education Center.

Rootstock	Trunk cross-sectional area (cm ²)	Yield per tree (kg)		Yield efficiency (kg/cm ² TCA)		Fruit weight (g)	
		2001	Cumulative (1998-2001)	2001	Cumulative (1998-2001)	2001	Average (1998-2001)
V.1	13.1	9	21	0.7	1.7	138	147
V.2	17.3	12	23	0.6	1.3	147	148
V.3	10.6	7	22	0.6	2.1	135	140
V.4	48.2	16	33	0.3	0.7	155	148
V.7	19.6	5	24	0.3	1.3	121	139
M.26 EMLA	18.0	12	25	0.7	1.5	148	154

comparable trees on M.7. Trees on V.2 and V.7 were similar in size to those on M.26 EMLA. Next smallest were trees on V.1. In another trial at the UMass Cold Spring Orchard, trees on V.1 were somewhat larger than trees on M.26 EMLA. The smallest trees were on V.3, likely similar in size to comparable trees on M.9.

To date, cumulative yield (1998-2001) was highest from the largest trees (Table 1). However, when adjusted for tree size, the most yield efficient trees were on V.3, V.1, and M.26 EMLA (Table 1). The least yield efficient trees were on V.4. In 2001,

V.4 resulted in significantly larger fruit than did V.7, but overall, there was no consistent effect of rootstock on fruit size

. These trees are too young to make a great number of conclusions, but these results along with those from three other trials at the UMass Cold Spring Orchard suggest that V.1 and V.3 are promising, dwarfing rootstocks. Their hardiness, potential disease resistance, and yield efficiency make them worthy of continued trial.

