

Iowa Planting of the 2003 NC-140 Dwarf Apple Rootstock Trial

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Introduction

To evaluate the adaptability and performance of new and promising apple rootstocks in the dwarfing size-control category, a NC-140 regional rootstock trial was established in 2003 at 15 sites in the United States (AR, CA, IA, GA, KY, ME, MI, NY, OH, PA, UT, VA, WI), Canada (BC), and Mexico. The Iowa planting, located at the ISU Horticulture Station, includes 23 rootstocks (CG.3041, CG5935, CG.6210, J-TE-G, J-TE-H, JM.1, JM.2, JM.7, JM.8, PiAu 51-11, PiAu 51-4, PiAu 56-83, Bud.62-396, B.9, M.9 Pajam 2, M.26 EMLA, M.9 T337, G.16, JM.4, JM.5, JM.10, PiAu 36-2, CG.5179) that are being evaluated with Gibson Golden Delicious serving as the test cultivar.

Materials and Methods

The trees were planted in an 8.2 ft × 16 ft area as two-tree plots in a randomized complete block design replicated four times (8 trees/rootstock with PiAu 36-2, JM.10, JM.5, and JM.8 tested with less than a full complement of trees). Pacific Gala/B.9 trees were planted between each block and at the ends of the rows as pollinators. Trees are being trained to a vertical axis using a 3/4-inch metal conduit for support. This report summarizes the tree-growth characteristics through the 2005 growing season.

Results and Discussion

A freeze during the blooming stage (24°F on May 3) greatly reduced fruit yield in 2005 (Table 1). Based upon blossom clusters/cm² in a cross sectional area of the trunk, trees on more vigorous rootstocks generally had lower bloom densities than trees on the more size-controlled rootstocks. However, among the more size-controlled rootstocks, trees with JM.10, CG.5179, JM.4, and PiAu 51-11 had lower blossom-cluster densities than trees with similar-sized rootstocks. Among the larger-sized rootstocks, trees with JM.8 had a higher bloom density than the other similar-sized rootstocks.

Differences in tree size among rootstocks are becoming evident (Table 1). Based on the cross sectional area of the trunk, trees with JM.2, PiAu 51-4, PiAu 36-2, and PiAu 56-83 are the largest, while trees with J-TE-G, B.9, and JM.10 are the smallest. Suckering is significantly higher on M.9 T337, JM.5, CG.5935, PiAu 56-83, and JM.2 than on the other rootstocks.

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Table 1. Bloom, fruit yield, and growth characteristics of Golden Delicious apple trees on 23 rootstocks in the Iowa planting of the 2003 NC-140 apple rootstock trial for 2005.

Rootstock	Blossom Clusters		per TCSA ^z	Yield /tree (lb)	Yield Eff. ^y	Trunk dia. (in)	Tree height (ft)	Tree spread (ft)	# of suckers /tree
	Terminal	Axillary							
JM.2	25.3	52.5	8.6	.68	.017	1.94	9.8	7.2	.9
PiAu 56-83	3.4	24.5	3.9	.03	.001	1.88	10.0	7.3	.0
PiAu 51-4	4.6	32.9	4.7	.33	.007	1.86	9.8	7.1	.0
PiAu 36-2	6.3	31.0	4.3	.87	.020	1.81	10.0	8.2	1.0
JM.5	9.3	14.0	4.1	.00	.000	1.70	8.8	6.2	1.2
JM.8	19.6	56.9	11.5	.41	.015	1.66	9.3	7.2	.0
JM.7	21.8	38.0	7.7	.17	.005	1.63	8.9	6.7	.0
J-TE-H	15.5	49.8	9.7	.80	.030	1.60	9.2	7.3	.0
CG.6210	21.0	69.0	13.7	.77	.028	1.60	9.6	7.1	.0
CG.5935	30.3	64.3	13.9	.93	.032	1.59	9.1	7.1	1.1
PiAu 51-11	9.1	31.4	7.0	.20	.008	1.56	9.0	6.7	.1
G.16	37.9	66.6	17.3	1.33	.051	1.51	8.2	5.8	.0
JM.4	16.1	15.4	6.1	.28	.012	1.49	8.1	5.7	.0
Bud.62-396	28.5	54.5	12.6	.60	.025	1.49	8.8	6.4	.1
JM.1	35.7	75.9	18.8	.66	.029	1.46	8.1	6.3	.4
M.9 Pajam2	24.1	47.4	12.3	.39	.017	1.43	8.5	6.0	.4
CG.5179	12.1	36.3	9.3	.51	.024	1.41	8.8	6.3	.0
M.26	7.4	44.4	10.9	.81	.040	1.40	9.0	6.9	.1
M.9 T337	39.0	65.4	20.1	.85	.043	1.37	8.3	5.5	1.4
CG.3041	18.1	30.6	11.0	.51	.029	1.26	8.2	5.5	.0
JM.10	6.6	22.8	7.0	.10	.005	1.23	7.7	5.3	.2
B.9	18.3	53.0	22.4	.40	.037	1.06	7.3	5.2	.0
J-TE-G	29.0	33.5	20.8	.45	.042	1.02	6.7	4.4	.0
LSD (P<.05)	15.1	21.8	5.2	.71	.032	.18	.9	.9	.9

^z TCSA (trunk's cross sectional area in cm²) at the end of 2004 growing season.

^y Kilograms of fruit/cm² of the trunk's cross sectional area at the end of the 2005 growing season.