

# ANNUAL REPORT TO NC-140



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## 2002 Massachusetts/New Jersey 'Cameo' Dwarf Rootstock Trial

November, 2008 – Cuauhtémoc, MX

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*'Cameo' fruit*

### Planting description and protocol

In 2002 semi-formal NC-140 plantings were established at the University of Massachusetts Cold Spring Orchard Research and Education Center in Belchertown, MA and at the Rutgers Snyder Research and Extension Farm in Pittstown, NJ. 'Cameo' apple trees (Willow Drive Nursery) on three dwarfing rootstocks – Geneva (G.) 16, M.9-NAKBT337 (M.9-337), and B.9 – were planted in a randomized complete block design (10 replications) spaced at 1.2 X 3.6 m. (Massachusetts) and 2.5 X 4.5 m. (New Jersey). All trees are trickle irrigated and have been trained to a vertical axis.

Annual measurements of trunk circumference, tree height and spread (2006 only, reported in 2006), suckering, fruit yield (beginning in 2003), and fruit size (NJ only 2004, 05, 08) have been made.

It is anticipated similar data collection will continue for another five growing seasons. An article on the preliminary performance (2002-2006) of these three commercial dwarf rootstocks will be published in 'Fruit Notes' and Journal of the American Pomological Society (APS). Posters and abstracts at NE ASHS Meeting in January, 2008 (Rutgers University, NJ) and ISHS Orchard Symposium, August, 2008 (Geneva, NY).

### Results

This report presents data from the 2008 (7<sup>th</sup> leaf) growing season, and results are presented on page 2. in Tables 1. – 3.

Over both states, G.16 had the largest trunk area, followed by M.9 and B.9. (Table 1.) In Massachusetts, G.16 was larger than both M.9 and B.9. In New Jersey, G.16 and M.9 are both larger than B.9.

In Massachusetts and over both states, M.9 has more root suckers than B.9, and G.16 was intermediate in rootstock number but was the same as M.9 and B.9. (Tables 1. and 2.) There was no difference in suckering between the rootstocks in New Jersey. (Table 2.)

In 2008, there was no difference in yield per tree between the rootstocks across both states. (Table 1.) Cumulative yield (2003-2008) did not differ either. Yield efficiency, however, was greater for B.9 compared to G.16, with M.9 intermediate and no different than B.9 and G.16. B.9 had the highest cumulative yield efficiency compared to both M.9 and G.16.

By state, there appears to be no difference in yield by rootstocks in Massachusetts, however, G.16 yielded less than the two other rootstocks in New Jersey. Cumulative yield (2003-08) of G.16 exceeded the two other rootstocks in Massachusetts, however, in New Jersey there appears to be no difference in cumulative yield between the three rootstocks. (Table 3.)

Yield efficiency in 2008 did not differ by rootstock in Massachusetts. (Table 3.) B.9, however, was more yield-efficient in New Jersey than the other two rootstocks in 2008. Similarly, cumulative yield efficiency (2003-2008) was highest for B.9 in New Jersey, but in Massachusetts there was no difference between the rootstocks.

Across both states and within both states, there was no difference in fruit size (weight in grams) between the rootstocks (Tables 1. and 3.). Across the rootstocks, however, New Jersey fruit were significantly larger than Massachusetts Cameo.

### Publications

Clements, Jon M., Win Cowgill, Wesley R. Autio, and Daniel Ward. 2008. Five-year performance of three dwarf apple rootstocks with Cameo™ Apple. HortScience. 43(4): 1194. (Abstr.)

Table 1. Overall trunk size, suckers, yield, and fruit size in 2008 of ‘Cameo’ apple trees on three rootstocks in the 2002 MA/NJ NC-140 Cameo Dwarf Rootstock trial.

Rootstock	Trunk cross-sectional area (cm <sup>2</sup> )	No. root suckers	Yield per tree (kg)	Cum. yield (2003-08) per tree (kg)	Yield efficiency (kg/cm <sup>2</sup> TCA)	Cum. yield efficiency (2003-08) (kg/cm <sup>2</sup> TCA)	Fruit weight (g)
G.16	40.5 a	1.0 ab	18.5	81.2	0.50 b	3.19 b	209
M.9-337	32.9 b	2.2 a	22.8	76.8	0.65 ab	3.34 b	232
B.9	20.6 c	0.7 b	20.0	69.0	0.88 a	4.47 a	221

Levels not connected by same letter are significantly different. (Tukey HSD P=0.05)

Table 2. Trunk size and suckers by state in 2008 of ‘Cameo’ apple trees on three rootstocks in the 2002 MA/NJ NC-140 Cameo Dwarf Rootstock trial.

Rootstock	Trunk cross-sectional area (cm <sup>2</sup> )		No. root suckers	
	<i>Mass.</i>	<i>New Jersey</i>	<i>Mass.</i>	<i>New Jersey</i>
G. 16	25.6 a	55.2 a	1.9 ab	0.1
M.9-337	16.2 b	49.7 a	4.0 a	0.5
B.9	13.4 b	27.7 b	0.8 b	0.6

Levels not connected by same letter are significantly different. (Tukey HSD P=0.05)

Table 3. Yield and fruit size by state in 2008 of ‘Cameo’ apple trees on three rootstocks in the 2002 MA/NJ NC-140 Cameo Dwarf Rootstock trial.

Rootstock	Yield per tree (kg)		Cum. yield (2003-08) per tree (kg)		Yield efficiency (kg/cm <sup>2</sup> TCA)		Cum. yield efficiency (2003-07) (kg/cm <sup>2</sup> TCA)		Fruit weight (g)	
	<i>Mass.</i>	<i>New Jersey</i>	<i>Mass.</i>	<i>New Jersey</i>	<i>Mass.</i>	<i>New Jersey</i>	<i>Mass.</i>	<i>New Jersey</i>	<i>Mass.</i>	<i>New Jersey</i>
G. 16	16.2	20.8	59.0	103.5	0.64	0.37	3.77	2.61	169	249
M.9-337	10.6	30.2	40.2	113.4	0.62	0.68	3.56	3.13	193	271
B.9	7.8	32.2	37.2	100.9	0.58	1.19	4.22	4.72	182	261