

## ANNUAL REPORT TO NC-140



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

November, 2009 – Chaska, MN

Jon M. Clements, Winfred P. Cowgill, and  
Wesley R. Autio



*trunk crack on G.16 (10/29/2009)*

### 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 four growing seasons. An article on the up-to-date performance (2002-2009) of these three commercial dwarf rootstocks has been published in the Volume 74, Combined Issue of 'Fruit Notes.'

### Results

This report presents data from the 2009 (8<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. (Table 2.) In New Jersey, G.16 and M.9 are both larger than B.9.

Massachusetts rootstocks exhibited more suckering than New Jersey, however, there was no difference in suckering between the rootstocks within State. (Table 2.) Longitudinal trunk cracks were observed on two (20%) G.16 rootstocks in Massachusetts, pictured above.

In 2009, there was no difference in yield per tree between the rootstocks across both states. (Table 1.) Cumulative yield (2003-2009) did not differ either. Yield efficiency, however, was greater for both B.9 and M.9 compared to G.16. B.9 had the highest cumulative yield efficiency compared to both M.9 and G.16.

There is no difference in yield and cumulative yield per tree by rootstocks in both states. (Table 3.) Yield efficiency, however, was highest in Massachusetts for M.9, followed by B.9, and then G.16 with the lowest efficiency. (Table 3.) B.9, however, was more yield-efficient in New Jersey than the other two rootstocks. Similarly, cumulative yield efficiency (2003-2009) was highest for B.9 in New Jersey, but in Massachusetts there was no difference between the rootstocks.

Across both states, M.9 fruit were larger than G.16 fruit, but did not differ in size from B.9 fruit. (Table 1.) In New Jersey, G.16 fruit were smaller than both M.9 and B.9 fruit. And overall in 2009, New Jersey fruit were smaller (230 g.) than Massachusetts fruit (248 g.).

### Publications

Clements, J.M., W.P. Cowgill, and W.R. Autio. 1999. To-Date Performance of Three Dwarf Rootstocks in the 2002 NC-140 Apple/Cameo Rootstock Trial in Massachusetts and New Jersey. Fruit Notes, Vol. 74 Combined Issue. (In press.)

Table 1. Overall trunk size, suckers, yield, and fruit size in 2009 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 (2003-09) per tree (kg)	Yield efficiency (kg/cm <sup>2</sup> TCA)	Cum. yield efficiency (2003-09) (kg/cm <sup>2</sup> TCA)	Fruit weight (g)
G.16	47.5 a	1.3	25.0	106.2	0.49 b	3.7 b	221 b
M.9-337	37.3 b	2.6	30.0	106.8	0.9 a	4.2 b	254 a
B.9	22.8 c	1.3	19.1	87.2	0.85 a	5.3 a	241 ab

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

Table 2. Trunk size and suckers by state in 2009 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	34.4 a	60.7 a	2.3	0.3
M.9-337	18.9 b	55.7 a	4.6	0.5
B.9	15.8 b	29.7 b	1.8	0.8

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

Table 3. Yield and fruit size by state in 2009 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 (2003-09) per tree (kg)		Yield efficiency (kg/cm <sup>2</sup> TCA)		Cum. yield efficiency (2003-09) (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	9.6	40.4	68.6	143.9	0.32 c	0.66 b	4.10	3.27 b	243	199 b
M.9-337	20.0	40.1	60.1	153.5	1.07 a	0.73 b	4.62	3.88 b	252	257 a
B.9	11.9	26.3	49.0	125.4	0.79 b	0.90 a	5.01	5.63 a	248	234 a