

2010 Apple Rootstock Trials

November, 2015 -- Davis, CA

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This year was the sixth season of the 2010 NC-140 Apple Rootstock Trials. Data submitted in 2015, however, were for the fifth growing season (2014). All sites submitted data, and they were received in an easily read format, but there were a few problems with cooperators following the protocol. **Everyone is encouraged to review their data and make sure that all measurements are the unit requested. Further, include only those data requested in the protocol, with the same columns in the spreadsheet, and in the same order.** All data should be submitted in the format and units requested and by the submission deadline (January 15).

The data to be submitted and the format of the data submission are presented in the Data Submission Protocol on Page 3. Submit these data in Excel spreadsheet format, using the rootstock codes described in the protocol, by **January 15, 2016**.

In 2016, follow the Pruning and Training Plan (Page 2) and the Trial Protocol for 2016 (Page 2).

To avoid problems during the compilation of the data, please pay particular attention to the following points:

1. **Submit only the data requested.**
2. **Use the correct units.**
3. **Columns must be consistent with the protocol.**
3. **Make sure that all data make sense -- proofread your data set.**
4. **For rootstock and replication designations, follow the protocol exactly -- rootstock names should appear as they are listed in the Data Submission Protocol (Page 3) -- please note that there are no spaces in any of these names.**

Rootstocks, cultivars, and locations involved in the 2010 NC-140 Apple Rootstock Trial. Honeycrisp plantings are spaced 4'x12', and Fuji plantings are spaced 6'x14'. All trees are trained to the Tall Spindle System.

Rootstocks	Honeycrisp sites	Aztec Fuji sites
B.9	BC	CH
B.10	CH	ID
B.7-3-150	CO	KY
B.7-20-21	IA	NC
B.64-194	MA	PA
B.67-5-32	MN	UT
B.70-6-8	MI	
B.70-20-20	NJ	
B.71-7-22	NS	
G.11	NY	
G.41 N	OH	
G.41 TC	UT	
G.202 N	WI	
G.202 TC		
G.935 N		
G.935 TC		
CG.2034		
CG.3001		
CG.4003		
CG.4004		
CG.4013		
CG.4214		
CG.4814		
CG.5087		
CG.5222		
PiAu 9-90		
PiAu 51-11		
Supp.3		
M.26 EMLA		
M.9 Pajam2		
M.9 NAKBT337		

Send 2015 data via email to Wes Autio (autio@umass.edu) by

January 15, 2016

Trial Protocol for 2016

Tree management.

- A. Trees must be supported and trained as Tall Spindles (see Pruning & Training Plan, Mature Tree).
- B. Adjust crop load as described in the Pruning & Training Plan, Mature Tree.
- C. Manage pests, nutrients, and water per local recommendations. Pay attention to weed control in this trial.

Collect the follow data for each tree in 2016.

- A. Root suckers: the number removed and counted, August.
- B. Yield: count all fruit per tree and weigh (to the nearest 0.1 kg).
- C. Zonal leaf chlorosis: after Honeycrisp harvest, visually estimate the portion (%) of the canopy exhibiting symptoms.
- D. Trunk size: trunk circumference 30 cm above the graft union (mm), October.
- E. Status: 0=dead, 1=alive, and 2=missing data, October.

Pruning and Training Plan for the Tall Spindle System

<i>Mature Tree</i>	Dormant	<ol style="list-style-type: none"> 1. Limit tree height to 11.5' (3.6m) by annually cutting leader back to a weak fruitful side branch. 2. Annually, remove at least 2 limbs, including lower tier scaffolds, that are more than 3/4" in diameter using a bevel cut. 3. Simplify each remaining branch on the tree so that it is columnar with no major side branches. 4. Shorten branches that extend into the row to facilitate movement of equipment and preserve fruit quality on the lower limbs.
	Late May	Chemically thin, and then follow up with hand thinning to appropriate levels to ensure regular annual cropping and adequate fruit size. (Target = 120-150 fruits/tree)
	August	Lightly summer prune to encourage light penetration and maintain pyramidal tree shape.

Table 1. Rootstock means for trunk cross-sectional area, number of branches, and height of the graft union at planting of Honeycrisp apple trees in the 2010 NC-140 Honeycrisp Apple Rootstock Trial. Means are based on data from BC, MA, MI, MN, NJ, NS, NY, OH, UT, and WI.

Rootstock	Trunk cross-sectional area at planting (2010, cm ²)	Number of branches at planting	Height of graft union at planting (mm)
B.9	1.2	5.6	107
B.10	1.4	6.7	105
B.7-3-150	1.3	4.3	116
B.7-20-21	2.0	9.3	125
B.64-194	1.9	8.4	126
B.67-5-32	1.5	6.0	103
B.70-6-8	1.6	6.5	104
B.70-20-20	2.4	11.9	128
B.71-7-22	0.6	0.6	111
G.11	1.4	10.9	118
G.41N	1.3	6.7	106
G.41TC	0.9	4.3	77
G.202N	2.0	12.8	107
G.202TC	1.5	11.8	88
G.935N	1.6	11.5	105
G.935TC	1.3	9.0	82
CG.2034	1.2	6.6	88
CG.3001	1.8	13.5	94
CG.4003	1.1	6.6	113
CG.4004	1.6	15.4	108
CG.4013	1.4	9.9	85
CG.4214	1.4	13.5	107
CG.4814	1.8	14.3	113
CG.5087	1.8	15.0	112
CG.5222	1.8	11.3	90
Supp.3	1.1	5.4	105
PiAu 9-90	2.6	17.8	136
PiAu 51-11	2.0	9.6	127
M.9 NAKBT337	1.4	8.6	121
M.9 Pajam 2	1.5	8.5	119
M.26 EMLA	1.2	4.9	112
Estimated HSD	0.2	2.2	16

Table 2. Site means for trunk cross-sectional area, number of branches, and height of the graft union at planting of Honeycrisp apple trees in the 2010 NC-140 Honeycrisp Apple Rootstock Trial.

Rootstock	Trunk cross-sectional area at planting (2010, cm ²)	Number of branches at planting	Height of graft union at planting (mm)
BC	1.3	11.3	114
MA	1.7	11.3	152
MI	1.4	4.5	99
MN	1.8	10.0	68
NJ	2.0	11.7	169
NS	1.7	---	84
NY	1.4	9.1	116
OH	---	10.5	66
UT	1.4	6.1	108
WI	1.4	5.7	140
Estimated HSD	0.6	5.3	13

Table 3. Rootstock means for trunk cross-sectional area, root suckers, tree height, canopy spread, yield per tree, yield efficiency, fruit size, and zonal chlorosis of Honeycrisp apple trees in the 2010 NC-140 Honeycrisp Apple Rootstock Trial. Means are based on data from BC, MA, MI, MN, NJ, NS, NY, OH, UT, and WI.

Rootstock	Survival (2014, %)	Trunk cross- sectional area (2014, cm ²)	Cumulative root suckers (2010-14, no./tree)	Tree height (cm)	Canopy spread (cm)	Yield per tree (2014, kg)	Cumulative yield per tree (2011-14, kg)	Yield efficiency (2014, kg/cm ² TCA)	Cumulative yield efficiency (2011-14, kg/cm ² TCA)	Fruit weight (2014, g)	Average Fruit weight (2012-14, g)	Zonal chlorosis (%)		
												2012	2013	2014
B.9	100	6.5	2.5	216	110	5.8	14.6	0.9	2.3	207	201	14	30	30
B.10	96	9.9	0.8	257	143	8.4	21.9	0.9	2.2	237	225	10	26	32
B.7-3-150	100	17.7	0.8	311	171	12.0	23.7	0.7	1.4	241	235	15	24	26
B.7-20-21	100	20.1	1.1	296	170	11.8	25.0	0.6	1.3	227	219	17	30	30
B.64-194	98	21.1	0.2	317	185	10.9	26.0	0.6	1.3	249	230	14	23	25
B.67-5-32	100	18.8	1.0	311	163	8.2	18.7	0.5	1.1	244	234	17	27	29
B.70-6-8	99	17.5	0.4	299	165	10.9	24.0	0.7	1.4	228	221	13	26	29
B.70-20-20	99	33.8	3.3	365	221	11.9	23.8	0.4	0.7	230	234	12	20	23
B.71-7-22	91	2.4	2.1	153	59	2.1	4.9	0.9	2.1	178	186	14	46	43
G.11	99	9.4	2.0	269	156	10.7	23.9	1.2	2.6	229	221	20	44	31
G.41N	95	10.2	0.4	265	152	10.2	24.1	1.0	2.3	240	230	16	35	31
G.41TC	94	9.9	1.6	279	164	8.9	21.0	0.9	2.2	232	241	28	40	42
G.202N	94	18.1	7.7	317	195	13.7	31.5	0.8	1.8	232	228	24	29	38
G.202TC	98	11.2	4.8	280	158	10.2	23.2	1.0	2.1	207	199	27	42	38
G.935N	90	12.4	4.3	289	179	13.1	29.9	1.1	2.4	214	211	27	51	37
G.935TC	96	10.7	4.7	270	162	11.0	24.8	0.9	2.4	209	206	27	55	47
CG.2034	95	6.8	1.5	256	125	6.2	15.5	0.9	2.3	223	217	22	58	47
CG.3001	91	14.7	0.6	286	188	11.9	30.1	0.9	2.1	242	233	24	43	40
CG.4003	98	7.6	1.0	250	131	9.1	19.9	1.2	2.6	203	202	24	40	31
CG.4004	98	17.2	3.9	321	193	14.7	35.5	0.9	2.0	243	235	18	27	36
CG.4013	97	12.4	4.0	278	158	8.5	18.6	0.8	1.6	207	209	25	47	50
CG.4214	99	11.6	8.5	301	171	10.6	26.4	1.0	2.4	221	217	30	45	48
CG.4814	84	13.9	6.9	299	191	12.9	29.8	1.0	2.2	224	225	27	52	45
CG.5087	97	13.4	2.8	300	191	12.3	30.8	0.9	2.2	205	203	28	41	50
CG.5222	93	14.4	8.3	290	173	10.6	25.0	0.8	1.8	218	216	17	42	44
Supp.3	94	9.1	1.6	253	148	8.9	19.9	1.0	2.2	213	213	19	54	54
PiAu 9-90	100	17.6	0.7	290	168	5.8	16.2	0.3	0.9	184	179	58	62	67
PiAu 51-11	100	15.2	1.5	278	162	9.0	20.3	0.6	1.4	246	231	23	39	40
M.9 NAKBT337	100	9.6	4.1	253	145	11.0	22.5	1.2	2.4	224	222	16	41	34
M.9 Pajam 2	100	10.6	8.6	260	148	9.7	21.7	0.9	2.0	211	209	19	42	43
M.26 EMLA	99	11.7	2.3	263	152	8.2	19.6	0.7	1.7	222	216	20	30	38
Estimated HSD	10	2.2	3.0	22	15	3.2	4.6	0.2	0.3	32	25	13	14	13

Table 4. Site means for trunk cross-sectional area, root suckers, tree height, canopy spread, yield per tree, yield efficiency, fruit size, and zonal chlorosis of Honeycrisp apple trees in the 2010 NC-140 Honeycrisp Apple Rootstock Trial.

Rootstock	Survival (2014, %)	Trunk cross- sectional area (2014, cm ²)	Cumulative root suckers (2010-14, no./tree)	Tree height (cm)	Canopy spread (cm)	Yield per tree (2014, kg)	Cumulative yield per tree (2011-14, kg)	Yield efficiency (2014, kg/cm ² TCA)	Cumulative yield efficiency (2011-14, kg/cm ² TCA)	Fruit weight (2014, g)	Average fruit weight (2012-14, g)	Zonal chlorosis (%)		
												2012	2013	2014
BC	100	10.6	6.2	276	119	12.7	21.9	1.4	2.3	304	283	---	52	---
MA	99	14.2	7.3	301	186	9.4	24.3	0.8	1.9	234	225	---	50	35
MI	99	12.8	1.0	258	129	6.5	17.3	0.6	1.5	202	202	---	29	65
MN	100	14.5	0.1	294	186	8.4	17.9	0.7	1.5	173	182	14	47	40
NJ	99	19.2	4.1	334	275	10.4	24.4	0.6	1.5	317	280	---	---	15
NS	89	13.6	0.2	278	113	11.8	26.1	0.9	2.1	165	174	15	37	63
NY	99	16.2	5.3	322	171	8.1	33.5	0.6	2.4	261	241	21	19	23
OH	93	13.5	0.8	236	114	11.7	13.7	0.9	1.2	178	178	---	---	---
UT	96	13.3	1.3	219	133	13.7	16.4	1.1	1.4	---	175	---	---	---
WI	99	13.3	2.7	285	175	7.8	30.8	0.6	2.6	178	236	30	23	14
Estimated HSD	8	3.5	2.9	27	21	4.8	7.8	0.3	0.4	31	24	11	15	12

Table 5. Survival (2014, %) of Honeycrisp apple trees at individual planting locations in the 2010 NC-140 Honeycrisp Rootstock Trial.

Rootstock	BC	CH	CO	IA	MA	MI	MN	NJ	NS	NY	OH	UT	WI
B.9	100	100	100	100	100	100	100	100	100	100	100	100	100
B.10	100	89	100	100	100	100	100	100	88	89	100	86	100
B.7-3-150	100	100	100	100	100	100	100	100	100	100	100	100	100
B.7-20-21	100	92	100	100	100	100	100	100	100	100	100	100	100
B.64-194	100	43	100	100	100	100	100	100	100	100	84	100	100
B.67-5-32	100	80	100	100	100	100	100	100	100	100	100	100	100
B.70-6-8	100	92	100	100	91	100	100	100	100	100	100	100	100
B.70-20-20	100	100	100	100	100	100	100	92	100	100	100	100	100
B.71-7-22	100	100	100	100	100	100	100	80	83	100	67	100	83
G.11	100	58	100	100	100	100	100	100	90	100	100	100	100
G.41N	100	82	100	100	100	100	100	100	70	100	100	91	90
G.41TC	100	100	100	100	100	100	100	100	50	100	100	100	100
G.202N	100	33	100	100	100	100	100	100	83	100	67	100	100
G.202TC	100	50	100	100	100	100	100	100	100	100	83	100	100
G.935N	100	100	---	100	100	100	100	100	67	100	67	78	89
G.935TC	100	100	100	100	100	100	100	100	100	100	100	67	100
CG.2034	100	40	100	100	100	100	100	100	100	100	67	67	100
CG.3001	100	0	100	100	50	100	100	100	50	100	100	100	100
CG.4003	100	60	100	100	100	100	100	100	75	100	100	100	100
CG.4004	100	100	100	100	100	100	100	100	100	100	75	100	100
CG.4013	100	50	---	100	100	100	100	67	100	100	100	100	100
CG.4214	100	71	100	100	100	100	100	100	100	100	100	86	100
CG.4814	100	57	100	100	100	86	100	100	14	100	50	100	100
CG.5087	100	100	100	100	100	100	100	100	100	100	100	67	100
CG.5222	100	80	100	---	100	100	100	100	43	100	100	100	100
Supp.3	100	67	100	33	100	100	100	100	100	83	80	100	100
PiAu 9-90	100	100	100	100	100	100	100	100	100	100	100	100	100
PiAu 51-11	100	100	100	100	100	100	100	100	100	100	100	100	100
M.9 NAKBT337	100	92	100	100	100	100	100	100	100	100	100	100	100
M.9 Pajam 2	100	92	100	100	100	100	100	100	100	100	100	100	100
M.26 EMLA	100	100	100	100	100	100	100	100	100	88	100	100	100
Estimated HSD	---	10	---	20	18	22	---	27	58	25	53	43	22

Table 6. Trunk cross-sectional area (2014, cm²) of Honeycrisp apple trees at individual planting locations in the 2010 NC-140 Honeycrisp Rootstock Trial.

Rootstock	BC	CH	CO	IA	MA	MI	MN	NJ	NS	NY	OH	UT	WI
B.9	5.4	5.6	6.9	5.5	6.3	6.9	7.3	5.5	8.1	6.3	6.2	6.5	7.0
B.10	8.2	8.5	13.8	8.9	10.4	9.7	10.1	9.9	9.6	12.2	10.3	9.2	9.5
B.7-3-150	11.8	11.7	22.4	20.6	18.3	14.6	21.1	25.0	13.7	21.7	17.2	17.9	15.8
B.7-20-21	15.1	10.8	27.3	18.7	17.3	16.2	21.5	28.9	22.1	22.4	19.4	18.0	20.0
B.64-194	11.8	12.3	31.1	17.2	22.2	21.6	22.3	26.4	23.2	22.8	20.6	17.9	23.1
B.67-5-32	14.6	10.9	27.1	20.7	20.0	21.6	20.3	23.8	16.6	18.4	19.2	16.4	17.1
B.70-6-8	11.4	11.0	22.7	19.8	19.7	13.6	19.6	23.5	14.3	23.0	18.3	16.6	15.7
B.70-20-20	26.0	16.5	49.5	21.8	34.7	28.4	38.8	47.0	30.3	35.9	31.5	34.0	32.6
B.71-7-22	2.1	3.5	3.7	3.1	2.3	2.8	3.1	2.9	1.6	2.6	2.2	2.4	2.3
G.11	6.8	8.2	12.3	11.0	8.9	9.4	9.9	13.2	7.8	10.2	7.3	10.4	9.7
G.41N	9.5	7.1	15.4	9.5	9.4	9.5	11.7	11.6	9.9	12.1	9.4	8.2	10.8
G.41TC	8.7	6.8	13.6	10.5	8.6	11.0	12.2	13.5	7.6	10.2	5.2	9.7	9.8
G.202N	14.7	9.6	13.7	19.6	20.6	14.3	18.2	24.1	17.8	18.2	16.6	15.1	18.0
G.202TC	83.0	6.7	15.3	11.1	12.9	9.8	11.7	13.5	10.1	16.2	9.2	10.9	9.0
G.935N	10.7	7.1	---	10.9	12.7	10.7	12.1	16.3	11.0	14.6	11.2	10.3	13.3
G.935TC	7.9	5.5	15.0	8.0	10.7	10.0	11.4	16.7	11.7	12.4	9.7	7.5	10.4
CG.2034	7.2	5.2	8.6	7.9	6.5	6.4	6.7	8.6	7.4	6.0	4.4	6.6	7.3
CG.3001	12.8	---	23.2	17.4	21.4	10.1	11.7	22.2	13.2	18.4	14.8	15.6	10.2
CG.4003	5.8	6.7	10.7	7.8	8.0	6.8	8.4	9.4	6.6	9.1	6.3	7.0	8.4
CG.4004	13.5	10.5	18.3	13.8	16.9	15.1	18.8	21.6	22.6	17.6	15.9	12.2	17.6
CG.4013	7.9	11.9	---	15.9	14.1	13.5	10.1	21.4	11.4	17.8	15.6	10.6	6.4
CG.4214	7.0	5.9	11.6	11.1	14.0	12.2	12.1	16.4	12.0	14.0	10.3	8.5	9.3
CG.4814	11.4	8.1	14.4	17.8	12.7	12.2	13.9	21.5	13.2	15.4	11.8	9.8	12.8
CG.5087	12.4	7.2	15.8	12.4	12.8	11.5	13.5	20.4	12.0	16.0	12.3	7.1	13.7
CG.5222	12.8	7.0	19.1	---	15.7	13.0	12.1	19.2	18.1	14.7	17.4	12.8	11.4
Supp.3	7.7	7.9	16.0	10.2	8.6	8.3	7.3	13.6	8.9	12.2	7.7	9.3	7.3
PiAu 9-90	14.8	11.5	23.4	12.1	16.9	13.2	13.3	28.8	15.7	23.4	15.5	20.6	12.9
PiAu 51-11	8.5	10.9	20.3	18.2	15.7	15.7	15.3	25.2	13.6	18.6	13.6	13.1	13.6
M.9 NAKBT337	7.2	7.3	13.3	9.7	10.0	8.7	9.8	13.2	7.9	11.8	9.6	9.0	9.0
M.9 Pajam 2	8.8	7.2	15.3	12.3	9.2	10.4	9.7	13.7	9.5	12.0	10.6	10.3	12.2
M.26 EMLA	9.9	8.2	14.0	13.0	10.2	11.2	11.2	15.7	13.3	12.2	11.1	11.0	10.4
Estimated HSD	5.2	3.8	11.4	10	7.3	6.2	3.8	5.6	8.2	6.9	5.5	11.0	7.4

Table 7. Cumulative yield per tree (2011-14, kg) of Honeycrisp apple trees at individual planting locations in the 2010 NC-140 Honeycrisp Rootstock Trial.

Rootstock	BC	CH	CO	IA	MA	MI	MN	NJ	NS	NY	OH	UT	WI
B.9	12.6	0.6	5.6	8.7	13.4	16.2	13.2	9.0	19.7	24.3	7.4	8.3	21.6
B.10	18.6	1.1	7.6	13.9	22.8	18.3	15.9	17.7	25.5	42.9	13.5	14.5	29.3
B.7-3-150	20.6	3.5	9.7	18.0	21.2	12.5	18.4	34.0	24.9	39.2	14.1	18.7	33.7
B.7-20-21	24.4	1.0	8.5	15.7	25.7	20.1	15.5	28.2	40.3	37.1	13.4	16.8	29.0
B.64-194	18.8	2.8	7.5	14.4	23.3	17.0	13.5	34.6	36.5	36.3	11.1	27.6	40.4
B.67-5-32	23.6	1.5	4.2	15.8	19.1	15.7	9.2	21.1	19.3	27.4	12.8	16.1	23.5
B.70-6-8	19.9	2.7	6.0	15.6	24.5	12.8	21.2	31.1	27.8	39.0	12.7	18.3	33.5
B.70-20-20	24.6	2.5	4.6	4.9	23.4	21.6	9.7	25.4	38.3	21.2	19.8	20.5	33.8
B.71-7-22	5.3	0.5	1.3	5.7	3.8	3.3	5.5	7.0	3.8	8.0	3.0	2.7	7.0
G.11	19.4	3.0	8.7	15.9	29.2	22.5	23.2	21.5	23.2	32.3	10.2	19.8	37.1
G.41N	25.1	1.6	9.7	17.2	27.1	18.6	23.5	17.5	31.9	33.7	14.7	14.6	37.6
G.41TC	22.1	1.7	11.4	14.7	18.1	13.8	21.5	16.3	49.0	26.9	8.3	15.6	26.8
G.202N	29.9	2.9	5.3	12.7	52.1	19.1	22.3	29.9	39.5	37.5	18.6	22.0	35.0
G.202TC	21.4	8.5	6.5	19.0	34.9	21.8	21.1	26.6	21.3	38.8	13.2	16.8	16.1
G.935N	32.4	1.7	---	14.9	42.2	24.1	23.9	22.3	27.0	36.5	17.8	16.8	53.2
G.935TC	17.5	1.1	9.7	10.9	22.3	24.7	19.4	32.5	31.7	33.9	16.1	14.7	41.8
CG.2034	18.9	1.2	3.5	11.2	14.0	11.3	14.8	13.9	13.6	17.2	9.4	10.3	25.4
CG.3001	31.9	---	8.6	24.6	53.1	15.5	17.8	27.1	31.8	45.7	22.7	22.3	43.4
CG.4003	17.2	1.0	5.0	14.4	26.3	17.2	15.4	18.9	19.6	35.0	7.5	11.5	26.4
CG.4004	38.0	4.0	10.0	25.3	40.1	20.6	30.4	37.4	55.9	37.5	24.3	13.3	56.3
CG.4013	20.0	1.6	---	13.2	37.2	14.0	18.9	24.5	17.8	23.0	17.5	15.1	11.9
CG.4214	27.1	2.4	11.8	18.3	27.3	23.6	21.9	27.1	31.4	38.4	17.3	9.9	37.1
CG.4814	33.0	1.4	9.5	17.3	31.6	20.1	26.7	30.4	32.4	47.9	13.5	16.7	32.9
CG.5087	32.6	1.5	6.4	16.3	30.5	20.9	25.3	38.3	33.5	42.2	25.6	6.6	45.2
CG.5222	24.2	1.0	7.6	---	22.9	16.3	18.9	33.2	35.0	39.1	15.6	21.4	28.3
Supp.3	22.4	1.8	5.4	7.1	19.9	12.5	15.9	17.7	20.2	35.7	8.0	18.7	25.0
PiAu 9-90	17.9	3.5	5.8	6.7	11.4	8.4	7.7	27.5	9.7	26.0	15.5	22.0	14.6
PiAu 51-11	15.9	1.7	8.6	15.4	20.4	15.6	19.1	24.1	18.3	37.3	16.0	16.1	21.4
M.9 NAKBT337	19.2	2.2	13.0	13.1	24.3	17.7	21.5	25.9	20.4	36.3	15.3	15.9	28.3
M.9 Pajam 2	20.8	1.2	13.3	12.1	17.7	17.7	16.2	28.7	20.0	30.2	11.8	16.8	37.0
M.26 EMLA	23.5	0.5	7.8	17.6	19.7	15.8	15.0	18.5	22.0	28.9	11.8	15.3	28.1
Estimated HSD	11.2	3.0	10.7	8.9	16.4	12.0	12.8	15.6	22.0	18.1	8.4	11.8	17.1

Table 8. Cumulative yield efficiency (2011-14, kg/cm² trunk cross-sectional area) of Honeycrisp apple trees at individual planting locations in the 2010 NC-140 Honeycrisp Rootstock Trial.

Rootstock	BC	CH	CO	IA	MA	MI	MN	NJ	NS	NY	OH	UT	WI
B.9	2.3	0.1	0.8	1.6	2.1	2.5	1.8	1.7	2.9	3.9	1.3	1.3	3.1
B.10	2.3	0.1	0.6	1.5	2.2	1.9	1.6	1.8	2.7	3.6	1.3	1.6	3.1
B.7-3-150	1.8	0.3	0.4	1.5	1.2	0.9	0.9	1.4	1.9	1.8	0.8	1.1	2.3
B.7-20-21	1.7	0.1	0.3	0.9	1.5	1.3	0.8	1.0	1.8	1.7	0.7	0.9	1.6
B.64-194	1.6	0.2	0.2	0.9	1.0	0.8	0.6	1.3	1.6	1.6	0.6	1.6	1.8
B.67-5-32	1.7	0.1	0.2	0.8	1.0	0.7	0.5	0.9	1.2	1.5	0.7	1.0	1.4
B.70-6-8	1.8	0.3	0.3	0.8	1.3	0.9	1.1	1.3	2.0	1.7	0.7	1.1	2.3
B.70-20-20	1.0	0.1	0.1	0.2	0.7	0.8	0.3	0.5	1.3	0.6	0.6	0.6	1.1
B.71-7-22	2.6	0.2	0.4	1.8	1.6	1.2	1.7	2.4	2.4	3.2	1.4	1.1	3.0
G.11	2.7	0.4	0.7	1.6	3.3	2.4	2.3	1.7	3.0	3.1	1.4	1.9	3.9
G.41N	2.7	0.2	0.7	1.8	2.9	1.9	2.0	1.5	3.2	2.8	1.6	1.7	3.5
G.41TC	2.5	0.3	0.8	1.4	2.0	1.3	1.8	1.2	6.0	2.6	1.7	1.7	2.8
G.202N	2.1	0.3	0.4	0.8	2.6	1.3	1.3	1.2	2.3	2.6	1.2	1.5	2.0
G.202TC	2.6	1.3	0.4	1.7	2.7	2.3	1.9	2.0	2.0	2.8	1.5	1.5	1.8
G.935N	3.1	0.2	---	1.4	3.3	2.3	2.0	1.4	2.5	2.5	1.6	1.6	4.0
G.935TC	2.3	0.2	0.6	1.4	2.2	2.6	1.7	2.0	2.8	2.8	1.7	1.9	4.0
CG.2034	2.6	0.2	0.4	1.4	2.0	1.7	2.2	1.6	2.0	2.9	2.0	1.5	3.5
CG.3001	2.5	---	0.4	1.4	2.5	1.5	1.6	1.2	2.4	2.5	1.5	1.4	4.3
CG.4003	3.1	0.2	0.5	1.8	3.3	2.5	1.8	2.0	3.0	3.9	1.2	1.6	3.2
CG.4004	2.8	0.4	0.6	1.8	2.3	1.4	1.6	1.8	2.4	2.2	1.5	1.1	3.3
CG.4013	2.5	0.1	---	0.8	2.6	1.1	1.9	1.1	1.6	1.4	1.2	1.4	1.8
CG.4214	3.9	0.4	1.0	1.6	2.0	2.0	1.8	1.7	2.7	2.8	1.7	1.2	4.1
CG.4814	2.9	0.2	0.7	1.0	2.5	1.7	1.9	1.4	2.5	3.1	1.2	1.7	2.6
CG.5087	2.6	0.2	0.4	1.3	2.1	1.8	1.9	1.9	2.9	2.6	2.1	1.0	3.3
CG.5222	1.9	0.1	0.4	---	1.4	1.2	1.6	1.8	2.0	2.7	0.9	1.7	2.5
Supp.3	2.9	0.2	0.4	0.7	2.3	1.7	2.1	1.3	2.1	2.9	1.0	2.0	3.4
PiAu 9-90	1.2	0.3	0.3	0.5	0.6	0.6	0.6	1.0	0.6	1.2	1.0	1.2	1.1
PiAu 51-11	1.9	0.2	0.4	0.9	1.3	1.0	1.2	1.0	1.4	2.0	1.2	1.3	1.7
M.9 NAKBT337	2.6	0.3	1.0	1.4	2.4	2.1	2.2	2.0	2.6	3.3	1.6	1.8	3.2
M.9 Pajam 2	2.4	0.1	0.9	1.1	1.9	1.7	1.7	2.0	2.1	2.4	1.1	1.4	3.1
M.26 EMLA	2.4	0.1	0.6	1.4	1.9	1.5	1.3	1.2	1.6	2.4	1.1	1.4	2.7
Estimated HSD	0.9	0.3	0.6	1.2	1.0	1.0	0.9	1.1	1.7	1.5	0.8	0.7	1.2

Table 9. Average fruit size (2011-14, g) of Honeycrisp apple trees at individual planting locations in the 2010 NC-140 Honeycrisp Rootstock Trial.

Rootstock	BC	CH	CO	IA	MA	MI	MN	NJ	NS	NY	OH	UT	WI
B.9	256	163	133	162	229	180	156	258	163	222	177	155	211
B.10	298	175	186	169	215	235	177	279	173	235	191	191	238
B.7-3-150	304	164	187	211	257	211	202	303	169	265	181	200	254
B.7-20-21	274	176	182	182	224	188	181	280	183	251	183	153	264
B.64-194	282	175	195	204	231	199	227	292	197	257	191	140	280
B.67-5-32	290	175	191	200	235	248	143	272	190	231	182	181	271
B.70-6-8	281	176	188	190	231	196	198	263	177	258	181	171	254
B.70-20-20	305	162	192	210	236	203	210	279	190	263	178	211	267
B.71-7-22	218	200	146	147	181	144	157	290	152	188	186	184	188
G.11	258	163	188	185	248	219	155	281	162	241	196	186	249
G.41N	303	179	200	192	245	228	186	296	172	246	171	214	222
G.41TC	312	174	200	213	241	221	197	281	440	247	177	154	215
G.202N	323	163	222	142	248	197	202	260	160	238	201	211	224
G.202TC	236	147	176	188	205	181	168	280	134	227	191	147	215
G.935N	295	178	---	161	221	190	146	274	170	227	173	177	200
G.935TC	287	187	193	145	206	189	152	264	163	248	158	196	201
CG.2034	295	172	174	185	230	148	180	284	162	254	169	191	215
CG.3001	326	---	174	214	227	167	193	281	209	259	187	206	218
CG.4003	279	192	165	161	208	260	159	276	134	194	148	122	217
CG.4004	317	160	197	208	232	196	203	291	309	228	196	153	224
CG.4013	286	179	---	202	216	169	175	272	188	223	174	195	200
CG.4214	277	171	200	196	240	194	177	284	176	251	160	175	227
CG.4814	310	177	200	221	214	221	176	276	128	248	157	198	197
CG.5087	303	167	187	197	237	208	161	270	158	221	162	140	185
CG.5222	306	169	212	---	207	201	176	260	138	234	182	164	246
Supp.3	299	184	180	184	217	197	164	265	145	235	186	207	200
PiAu 9-90	229	156	163	136	134	162	174	246	123	218	140	155	184
PiAu 51-11	266	179	178	216	239	206	219	278	182	255	167	206	293
M.9 NAKBT337	291	173	190	193	235	217	165	306	174	253	181	163	233
M.9 Pajam 2	277	192	200	175	211	216	164	288	149	228	169	143	244
M.26 EMLA	273	171	177	195	222	185	180	306	171	240	193	161	250
Estimated HSD	69	52	80	47	54	99	78	59	121	50	52	102	68

Table 10. Zonal chlorosis (2014, % of canopy affected) of Honeycrisp apple trees at individual planting locations in the 2010 NC-140 Honeycrisp Rootstock Trial.

Rootstock	BC		IA		MA		MI		MN			NJ		NS		NY			WI		
	2013	2013	2012	2014	2013	2014	2013	2014	2012	2013	2014	2014	2012	2013	2014	2012	2013	2014	2012	2013	2014
B.9	46	2	68	65	47	24	18	44	73	38	21	20	7	37	69	17	10	29	16	18	7
B.10	31	8	57	11	50	24	26	69	3	13	34	16	8	26	57	14	19	12	16	21	14
B.7-3-150	28	4	48	15	42	20	21	41	20	26	40	13	5	25	43	18	15	14	17	15	6
B.7-20-21	40	15	54	39	59	48	29	57	15	29	37	13	9	17	30	15	16	12	30	21	11
B.64-194	19	22	64	23	40	15	20	44	7	38	32	12	5	9	46	24	15	15	20	18	10
B.67-5-32	34	17	42	25	42	21	26	31	18	22	40	12	10	26	65	22	19	21	21	19	12
B.70-6-8	23	8	59	19	50	20	20	67	10	34	40	11	5	24	38	19	14	15	18	23	11
B.70-20-20	15	29	58	21	31	12	28	25	0	27	47	10	5	7	43	17	14	13	26	19	13
B.71-7-22	100	3	85	26	90	56	13	87	4	23	19	13	12	44	63	16	25	40	29	13	11
G.11	78	11	68	55	39	33	19	66	9	57	22	15	9	76	53	23	15	22	40	26	13
G.41N	66	12	60	29	31	14	19	57	0	49	34	18	24	43	64	22	15	25	25	19	12
G.41TC	60	22	53	32	65	34	28	81	13	44	53	27	13	20	63	28	28	23	50	23	13
G.202N	30	34	67	43	27	24	30	83	8	32	40	17	11	39	74	25	23	15	55	24	13
G.202TC	63	33	78	18	57	36	27	54	8	27	36	20	14	70	85	21	19	17	69	27	19
G.935N	66	60	79	71	43	44	60	80	23	68	32	20	9	63	57	26	23	19	45	31	13
G.935TC	90	73	80	55	65	80	37	66	25	75	63	20	5	65	40	27	18	35	53	30	15
CG.2034	94	27	78	58	80	60	15	71	20	80	40	15	5	83	74	25	28	58	40	19	14
CG.3001	50	10	60	28	60	60	50	77	25	71	50	10	30	10	60	30	23	35	13	20	5
CG.4003	68	8	73	47	40	20	25	84	20	40	18	20	47	67	77	18	29	11	18	11	11
CG.4004	18	26	70	48	33	16	35	70	5	33	40	13	9	19	78	31	16	25	29	33	10
CG.4013	73	13	47	42	50	50	43	81	13	66	53	20	20	30	88	26	23	33	43	37	20
CG.4214	83	48	66	53	53	59	27	86	22	55	39	16	35	44	78	31	21	34	31	32	21
CG.4814	70	45	55	56	66	74	37	91	13	68	44	13	90	90	80	24	22	29	38	35	18
CG.5087	55	53	60	83	53	52	37	92	25	60	66	13	30	35	80	23	17	37	37	28	8
CG.5222	55	---	---	---	67	48	28	77	4	47	50	10	27	22	73	19	29	18	26	25	28
Supp.3	88	86	90	75	52	60	38	92	13	79	79	20	19	52	75	17	18	40	29	32	15
PiAu 9-90	76	80	90	93	70	78	75	85	36	80	91	25	83	85	96	25	21	41	96	32	56
PiAu 51-11	49	22	51	20	60	45	43	74	23	59	42	13	21	18	64	20	24	24	27	21	18
M.9 NAKBT337	58	21	64	60	55	33	29	50	13	63	33	14	6	38	83	23	23	18	22	20	7
M.9 Pajam 2	53	36	67	55	53	39	28	85	17	79	50	14	8	44	76	24	17	21	30	22	13
M.26 EMLA	30	7	55	30	55	30	23	71	25	25	29	16	16	42	79	23	26	31	18	17	9
Estimated HSD	44	45	29	50	44	42	33	45	25	45	36	12	31	49	43	13	14	28	35	27	25

Table 1. Rootstock means for trunk cross-sectional area, number of branches, and height of the graft union at planting of Fuji apple trees in the 2010 NC-140 Fuji Apple Rootstock Trial. Means are based on data from ID, KY, NC, and UT.

Rootstock	Trunk cross-sectional area at planting (2010, cm ²)	Number of branches at planting	Height of graft union at planting (mm)
B.9	1.4	4.0	89
B.10	1.9	6.3	90
B.7-3-150	2.2	5.3	92
B.7-20-21	1.1	2.1	98
B.64-194	1.5	4.9	90
B.67-5-32	1.5	3.6	97
B.70-6-8	2.2	5.8	95
B.70-20-20	2.6	10.3	84
B.71-7-22	0.8	1.2	77
G.11	1.6	7.8	99
G.41N	2.3	6.4	85
G.41TC	0.8	2.0	33
G.202N	2.6	10.3	99
G.202TC	2.2	10.0	88
G.935N	2.5	10.8	94
G.935TC	2.3	9.5	76
CG.2034	1.3	2.3	81
CG.3001	2.2	10.0	74
CG.4003	1.5	6.6	93
CG.4004	1.9	12.6	84
CG.4214	1.5	5.1	100
CG.4814	2.2	10.3	81
CG.5087	1.7	5.3	83
CG.5222	2.6	8.7	81
Supp.3	1.6	5.3	89
PiAu 9-90	3.0	11.5	102
PiAu 51-11	2.5	8.2	83
M.9 NAKBT337	1.6	4.7	81
M.9 Pajam 2	1.9	5.9	87
M.26 EMLA	2.0	9.0	87
Estimated HSD	0.9	2.7	23

Table 2. Site means for trunk cross-sectional area, number of branches, and height of the graft union at planting of Fuji apple trees in the 2010 NC-140 Fuji Apple Rootstock Trial.

Rootstock	Trunk cross-sectional area at planting (2010, cm ²)	Number of branches at planting	Height of graft union at planting (mm)
ID	2.0	6.9	60
KY	1.9	5.1	126
NC	2.0	10.6	122
UT	1.7	5.1	56
Estimated HSD	1.0	3.6	9

Table 3. Rootstock means for trunk cross-sectional area, root suckers, tree height, canopy spread, yield per tree, yield efficiency, fruit size, and zonal chlorosis of Fuji apple trees in the 2010 NC-140 Fuji Apple Rootstock Trial. Means are based on data from ID, KY, NC, and UT.

Rootstock	Survival (2014, %)	Trunk cross- sectional area (2014, cm ²)	Cumulative root suckers (2010-14, no./tree)	Tree height (cm)	Canopy spread (cm)	Yield per tree (2014, kg)	Cumulative yield per tree (2011-14, kg)	Yield efficiency (2014, kg/cm ² TCA)	Cumulative yield efficiency (2011-14, kg/cm ² TCA)	Fruit weight (2014, g)	Average Fruit weight (2012-14, g)
B.9	95	12.8	5.0	259	135	12.4	24.2	0.9	1.8	183	180
B.10	91	26.1	0.9	319	173	16.2	29.8	0.7	1.2	225	207
B.7-3-150	100	44.9	0.7	387	198	17.2	33.6	0.5	0.9	233	204
B.7-20-21	89	7.4	1.2	193	78	1.7	4.0	0.3	0.7	128	131
B.64-194	93	47.7	4.1	407	202	15.4	30.1	0.3	0.7	231	204
B.67-5-32	100	50.7	2.8	388	194	19.8	32.4	0.4	0.6	225	203
B.70-6-8	100	48.8	0.6	401	200	17.5	35.6	0.4	0.8	221	203
B.70-20-20	98	74.3	8.7	449	232	21.4	33.3	0.3	0.5	224	199
B.71-7-22	82	7.2	2.6	206	112	6.3	11.0	0.8	1.6	191	187
G.11	97	26.3	1.2	333	189	21.0	40.0	0.9	1.7	230	221
G.41N	100	27.4	1.3	334	201	21.2	36.7	0.7	1.2	221	213
G.41TC	100	25.8	3.0	332	178	19.1	31.8	0.8	1.2	240	230
G.202N	100	35.0	5.9	358	196	14.7	34.1	0.5	1.1	228	203
G.202TC	100	24.9	5.3	311	171	15.0	32.5	0.7	1.4	211	183
G.935N	95	31.3	3.8	350	192	26.5	51.9	1.0	1.8	227	204
G.935TC	100	29.6	9.4	316	176	20.1	41.3	0.8	1.6	216	207
CG.2034	100	14.0	2.6	278	151	12.8	23.1	0.9	1.7	216	193
CG.3001	100	40.5	3.2	402	204	26.6	47.1	0.6	1.1	230	220
CG.4003	100	15.5	1.6	281	152	10.5	24.5	0.7	1.8	179	169
CG.4004	100	37.6	4.5	377	204	30.5	53.8	0.8	1.4	242	222
CG.4214	100	20.0	4.1	317	165	14.4	28.8	0.7	1.5	228	214
CG.4814	91	30.7	9.1	339	191	17.5	31.4	0.6	1.1	218	199
CG.5087	100	21.2	2.6	314	186	13.1	24.8	0.8	1.4	216	196
CG.5222	100	38.8	7.0	379	207	25.8	44.5	0.7	1.2	245	221
Supp.3	83	22.3	0.2	298	157	15.4	30.2	0.7	1.5	205	211
PiAu 9-90	100	59.5	4.8	372	206	9.4	18.9	0.2	0.5	208	184
PiAu 51-11	93	52.2	0.5	397	207	21.4	34.1	0.5	0.7	239	217
M.9 NAKBT337	78	23.2	4.6	321	168	19.1	37.9	0.9	1.8	221	207
M.9 Pajam 2	81	29.9	6.6	343	180	26.3	46.8	0.9	1.7	224	213
M.26 EMLA	85	39.8	0.8	379	193	25.7	45.2	0.7	1.2	234	221
Estimated HSD	22	9.7	6.9	39	23	8.3	11.7	0.3	0.4	38	25

Table 4. Site means for trunk cross-sectional area, root suckers, tree height, canopy spread, yield per tree, yield efficiency, and fruit size of Fuji apple trees in the 2010 NC-140 Fuji Apple Rootstock Trial.

Rootstock	Survival (2014, %)	Trunk cross-sectional area (2014, cm ²)	Cumulative root suckers (2010-14, no./tree)	Tree height (cm)	Canopy spread (cm)	Yield per tree (2014, kg)	Cumulative yield per tree (2011-14, kg)	Yield efficiency (2014, kg/cm ² TCA)	Cumulative yield efficiency (2011-14, kg/cm ² TCA)	Fruit weight (2014, g)	Average Fruit weight (2012-14, g)
ID	100	31.3	0.1	338	107	33.2	60.6	1.1	2.1	236	232
KY	90	41.9	6.2	337	215	2.9	12.6	0.1	0.3	210	166
NC	88	29.9	---	357	190	10.8	20.9	0.5	1.0	211	203
UT	97	33.1	4.3	335	211	21.5	34.3	0.7	1.2	208	195
Estimated HSD	10	7.4	1.7	17	16	2.4	4.6	0.1	0.1	13	13

Table 5. Survival (2014, %) of Fuji apple trees at individual planting locations in the 2010 NC-140 Fuji Rootstock Trial.

Rootstock	CH	ID	KY	NC	PA	UT
B.9	100	100	92	92	100	100
B.10	100	100	100	70	100	92
B.7-3-150	100	100	100	100	100	100
B.7-20-21	92	100	100	55	0	100
B.64-194	100	100	71	100	---	100
B.67-5-32	100	100	100	100	100	100
B.70-6-8	100	100	100	100	92	100
B.70-20-20	100	100	100	100	89	92
B.71-7-22	100	100	80	56	---	90
G.11	---	100	88	100	100	100
G.41N	100	100	100	100	0	100
G.41TC	100	100	100	100	---	100
G.202N	100	100	100	100	0	100
G.202TC	100	100	100	100	100	100
G.935N	100	100	100	90	88	90
G.935TC	100	100	100	100	0	100
CG.2034	---	100	100	100	---	100
CG.3001	100	100	100	100	---	100
CG.4003	100	100	100	100	---	100
CG.4004	67	100	100	100	---	100
CG.4013	---	---	100	67	0	100
CG.4214	100	100	100	100	---	100
CG.4814	40	100	100	100	0	75
CG.5087	100	100	100	100	---	100
CG.5222	100	100	100	100	100	100
Supp.3	75	100	60	67	---	100
PiAu 9-90	100	100	100	100	0	100
PiAu 51-11	100	100	91	80	75	100
M.9 NAKBT337	91	100	50	60	90	100
M.9 Pajam 2	100	100	56	63	100	100
M.26 EMLA	100	100	55	83	100	100
Estimated HSD	37	---	53	68	46	33

Table 6. Trunk cross-sectional area (2014, cm²) of Fuji apple trees at individual planting locations in the 2010 NC-140 Fuji Rootstock Trial.

Rootstock	CH	ID	KY	NC	PA	UT
B.9	8.8	17.2	12.1	7.6	12.4	13.9
B.10	17.5	25.6	30.7	21.4	24.5	24.8
B.7-3-150	23.6	33.3	62.6	37.5	39.5	46.2
B.7-20-21	3.1	5.3	11.6	3.7	---	7.2
B.64-194	22.4	44.6	54.7	45.3	---	48.6
B.67-5-32	17.5	51.2	55.4	45.4	41.8	50.6
B.70-6-8	21.4	39.7	61.5	47.5	45.3	46.3
B.70-20-20	34.0	72.5	80.9	79.0	50.6	67.1
B.71-7-22	4.3	7.1	7.0	4.9	---	8.8
G.11	15.3	23.3	34.9	20.6	15.9	28.3
G.41N	---	41.0	21.1	24.0	---	28.2
G.41TC	15.0	26.9	29.9	20.4	---	26.1
G.202N	20.4	31.7	51.0	25.2	---	28.7
G.202TC	17.4	27.2	35.6	18.4	18.7	18.5
G.935N	12.5	28.0	43.1	20.4	23.6	32.4
G.935TC	15.5	24.9	42.4	19.0	---	37.0
CG.2034	---	13.2	14.4	10.5	---	18.4
CG.3001	---	46.2	42.0	33.6	---	40.7
CG.4003	9.1	11.7	21.5	13.0	---	16.0
CG.4004	16.6	42.9	37.6	26.6	---	43.5
CG.4013	---	---	29.6	14.4	---	22.2
CG.4214	9.2	21.2	31.1	12.2	---	17.6
CG.4814	11.2	30.1	41.0	28.4	---	26.5
CG.5087	8.1	14.5	31.0	8.9	---	21.0
CG.5222	18.2	43.5	45.6	29.7	25.3	36.8
Supp.3	15.7	17.9	31.0	20.6	---	23.4
PiAu 9-90	37.2	31.4	81.3	52.1	---	71.4
PiAu 51-11	22.2	43.9	62.6	44.3	46.5	57.6
M.9 NAKBT337	11.4	20.5	33.5	20.4	22.0	21.9
M.9 Pajam 2	10.7	29.6	36.1	20.7	23.1	31.6
M.26 EMLA	19.3	40.0	47.8	37.0	34.1	37.8
Estimated HSD	11.1	18.9	24.8	18.1	14.8	18.8

Table 7. Cumulative yield per tree (2011-14, kg) of Fuji apple trees at individual planting locations in the 2010 NC-140 Fuji Rootstock Trial.

Rootstock	ID	KY	NC	PA	UT
B.9	53.6	4.7	13.6	16.2	22.5
B.10	52.7	12.0	15.9	18.8	33.1
B.7-3-150	66.4	14.5	15.2	23.4	38.4
B.7-20-21	4.6	1.6	5.0	---	5.3
B.64-194	54.0	8.0	19.2	---	29.5
B.67-5-32	63.2	10.8	17.3	24.9	38.5
B.70-6-8	72.5	12.5	19.6	26.6	38.0
B.70-20-20	69.9	9.5	16.6	16.2	40.7
B.71-7-22	18.9	1.6	8.6	---	13.5
G.11	68.2	18.3	24.6	32.8	44.5
G.41N	108.5	10.3	23.4	---	28.5
G.41TC	57.1	9.4	20.0	---	40.5
G.202N	66.7	20.0	24.3	---	31.7
G.202TC	61.4	14.7	22.5	32.6	31.3
G.935N	92.8	22.4	34.1	33.4	61.5
G.935TC	61.2	12.0	31.8	---	52.6
CG.2034	43.5	6.5	11.0	---	28.0
CG.3001	95.4	13.7	17.5	---	55.7
CG.4003	31.7	13.3	23.2	---	29.8
CG.4004	116.3	18.9	36.3	---	43.5
CG.4013	---	6.7	20.3	---	20.7
CG.4214	55.7	9.6	15.7	---	25.0
CG.4814	60.0	18.0	16.3	---	36.5
CG.5087	51.3	18.6	12.7	---	23.7
CG.5222	78.7	26.6	31.2	24.6	39.0
Supp.3	38.4	17.4	23.4	---	33.1
PiAu 9-90	31.0	9.0	11.3	---	22.6
PiAu 51-11	61.5	11.2	17.5	20.5	37.1
M.9 NAKBT337	63.1	16.1	26.0	28.6	31.8
M.9 Pajam 2	72.3	12.2	36.3	29.1	43.8
M.26 EMLA	81.3	13.8	26.1	28.0	40.8
Estimated HSD	33.6	12.0	20.6	18.6	23.6

Table 8. Cumulative yield efficiency (2011-14, kg/cm² trunk cross-sectional area) of Fuji apple trees at individual planting locations in the 2010 NC-140 Fuji Rootstock Trial.

Rootstock	ID	KY	NC	PA	UT
B.9	3.1	0.4	1.9	1.3	1.6
B.10	2.1	0.4	0.7	0.8	1.4
B.7-3-150	2.0	0.2	0.4	0.6	0.8
B.7-20-21	0.9	0.1	1.5	---	0.6
B.64-194	1.2	0.1	0.4	---	0.6
B.67-5-32	1.3	0.2	0.4	0.6	0.8
B.70-6-8	1.9	0.2	0.4	0.6	0.9
B.70-20-20	1.0	0.1	0.2	0.3	0.6
B.71-7-22	2.8	0.2	1.8	---	1.6
G.11	3.0	0.5	1.3	2.1	1.6
G.41N	2.6	0.5	1.0	---	1.1
G.41TC	2.1	0.3	1.0	---	1.6
G.202N	2.1	0.4	1.0	---	1.2
G.202TC	2.3	0.4	1.2	1.7	1.7
G.935N	3.3	0.5	1.7	1.5	1.9
G.935TC	2.5	0.3	1.7	---	1.5
CG.2034	3.3	0.4	1.1	---	1.5
CG.3001	2.1	0.3	0.5	---	1.3
CG.4003	2.7	0.7	1.8	---	1.9
CG.4004	2.8	0.5	1.4	---	1.0
CG.4013	---	0.2	1.5	---	0.9
CG.4214	2.6	0.3	1.2	---	1.5
CG.4814	2.0	0.4	0.5	---	1.4
CG.5087	3.5	0.7	1.4	---	1.2
CG.5222	1.9	0.6	1.0	0.9	1.1
Supp.3	2.2	0.6	1.2	---	1.4
PiAu 9-90	1.0	0.1	0.4	---	0.3
PiAu 51-11	1.4	0.2	0.5	0.4	0.7
M.9 NAKBT337	3.1	0.4	1.4	1.3	1.4
M.9 Pajam 2	2.5	0.3	1.8	1.3	1.4
M.26 EMLA	2.1	0.3	0.7	0.8	1.1
Estimated HSD	1.1	0.4	1.2	0.5	0.6

Table 9. Average fruit size (2011-14, g) of Fuji apple trees at individual planting locations in the 2010 NC-140 Fuji Rootstock Trial.

Rootstock	ID	KY	NC	PA	UT
B.9	200	172	194	181	154
B.10	232	188	207	229	202
B.7-3-150	230	158	214	211	215
B.7-20-21	110	144	142	---	134
B.64-194	250	135	192	---	212
B.67-5-32	254	151	208	217	199
B.70-6-8	239	159	204	205	209
B.70-20-20	268	149	185	196	201
B.71-7-22	184	202	167	---	188
G.11	236	185	239	204	216
G.41N	304	174	203	---	201
G.41TC	275	171	256	---	219
G.202N	248	168	214	---	191
G.202TC	207	166	190	173	168
G.935N	251	164	208	228	197
G.935TC	221	165	226	---	203
CG.2034	232	177	127	---	214
CG.3001	289	179	192	---	208
CG.4003	152	174	191	---	160
CG.4004	283	170	217	---	219
CG.4013	---	133	187	---	185
CG.4214	247	186	220	---	192
CG.4814	240	158	207	---	189
CG.5087	250	163	239	---	181
CG.5222	301	166	211	201	198
Supp.3	230	228	187	---	199
PiAu 9-90	192	148	180	---	214
PiAu 51-11	270	154	208	235	223
M.9 NAKBT337	226	178	214	227	200
M.9 Pajam 2	241	164	217	215	209
M.26 EMLA	259	171	218	227	211
Estimated HSD	62	62	48	36	36