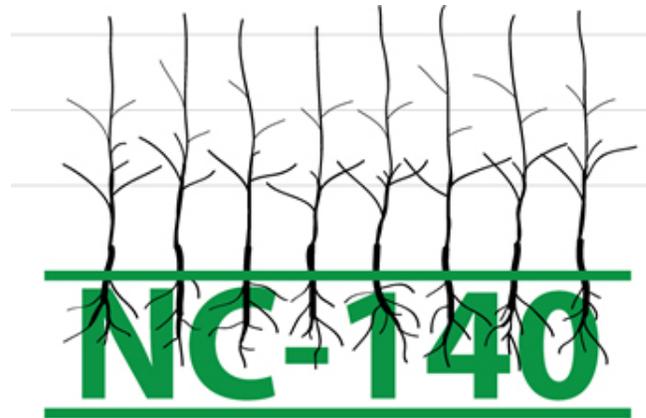




# 2017 NC-140 Semi-Dwarf Peach Rootstock Trial

*Data Report (2018) and  
Collection Protocol (2018-19)*

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## Summary

This year was the second year of the 2017 NC-140 Semi-Dwarf Peach Rootstock Trial. This trial is evaluating 8 rootstocks across 10 sites in United states and Canada (**Table 1**). The scion cultivar is 'Cresthaven'. Data collection have occurred at planting (spring 2017) and in fall of 2017 and 2018 (stock trunk diameter, tree survival, suckers count and trunk circumference). Data reports of the 2018 growing season will be collected in by mid-February and analyzed during spring of 2019.

The different sites received fairly similar size trees from the nurseries with CO receiving slightly larger and NC slightly smaller trees compared to the rest sites at planting (**Table 2**). In fall of the first season NC had the largest trees followed by NY, MI and SC. CO had the smallest trees after the first growing season. Survival was high (>91%) in all sites except of NY were a survival rate of 81% was recorded this first growing season.

**Table 1.** Rootstocks and locations involved in the 2017 NC-140 Semi-Dwarfing Peach Rootstock Trial. Cresthaven trees are spaced 1.5 or 1.8 x 4.5 or 5.5 m and trained to the Perpendicular-V. Each side includes 4 or 5 replications in randomized complete-block design with 2 data trees of each rootstocks treatment per replication

Rootstock	Code	Site
Controller™ 6	1	AL*
Controller™ 7	2	CO
Controller™ 8	3	GA*
MP-29	4	MI
Rootpac® 20	5	NC
Rootpac® 40	6	NY
Guardian®	7	ONT
Lovell	8	PA*
		SC
		UT*

\*2017 Data report was not submitted in time for analysis

Suckering was low with SC producing the most suckers across all sites (**Table 2**). MP-29 were the largest trees at planting in across all sites followed by Guardian® and Lovell. Controller™6 gave the smallest trees in the nursery similarly with Rootpac®40 (**Table 3**). In fall 2017 (first season) Guardian® was the most vigorous rootstock followed by Lovell across all sites. MP-29 and Rootpac® 20 clustered as semi-dwarf or moderate vigor and the rest of the rootstocks clustered together at the least vigorous category for this first establishment year (**Table 3**). Best performance in terms of survival observed in trees with Guardian® followed by Rootpac® 20 and Controller™ 7 and 8 and MP-29. Worst survival rates observed across all sites on trees with Rootpac® 40. Suckering was low across all rootstocks tested with the most vigorous rootstocks Guardian® and Lovell producing the most suckers (**Table 3**). In **Tables 4, 5, 6** and **7** rootstock performance data in terms of survival, tree size at planting and at fall of the first year as well as number of root suckers within each site are presented.

### ***Trial details***

**Sites:** AL, CO, GA, MI, NC, NY, ONT, PA, SC, UT

- **Collaborators:** Elina Coneva (AL), Ioannis Minas (CO), Dario Chavez (GA), Terence Robinson and Jaume Lordan Sanahuja (NY), Mike Parker (NC), Brent Black (UT), John Cline (ONT), Gregory Lang (MI), Jim Schupp (PA), Greg Reighard (SC)
- **Scion Cultivar:** Virus indexed Cresthaven from California
- **Training system:** Perpendicular-V
- **Rootstocks:** Controller™ 6, 7 and 8 (UC Davis); MP-29 (USDA-Georgia); Rootpac® 20 (Densipac) and Rootpac® 40 (Nanopac) (Agromillora Iberia); Controls: Guardian® (Clemson/USDA) and Lovell

## Data Tables

**Table 2.** Site performance in terms of 'Cresthaven' peach tree survival, trunk cross-sectional area (TCSA) at planting and in fall 2017 and number of root suckers across all rootstocks tested within the *2017 NC140 Peach Semi-Dwarf Rootstock Evaluation Trial*.

Rootstock	Survival (%)	TCSA (cm <sup>2</sup> ) at planting	TCSA (cm <sup>2</sup> ) at fall	Suckers
CO	95ab	1.2a	2.1c	0.2ab
MI	94ab	1.0ab	4.1b	0.2ab
NC	98ab	0.9b	7.2a	0.0b
NY	81b	1.0ab	4.2b	0.1b
ONT	91ab	1.0ab	3.0c	0.0b
SC	99a	1.2ab	4.1b	0.5a
Estimated HSD	8*	0.3	1.0	0.3

\*Mean separation in columns by Tukey's HSD ( $P=0.05$ ). HSD was calculated based on the number of observations per mean.

**Table 3.** Cresthaven' peach rootstock performance in terms of tree survival, trunk cross-sectional area (TCSA) at planting and in fall 2017 and number of root suckers across all sites reported data for the 2017 NC140 Peach Semi-Dwarf Rootstock Evaluation Trial.

Rootstock	Survival (%)	TCSA (cm <sup>2</sup> ) at planting	TCSA (cm <sup>2</sup> ) at fall	Suckers
Controller™ 6	91ab	0.4f	2.8d	0.0b
Controller™ 7	97ab	0.7ef	2.1d	0.0b
Controller™ 8	96ab	1.0d	2.7d	0.0b
MP-29	94ab	2.2a	4.8c	0.1b
Rootpac® 20	98ab	0.8de	4.5c	0.3ab
Rootpac® 40	78c	0.5ef	2.5d	0.1b
Guardian®	99a	1.8b	7.4a	0.4a
Lovell	89b	1.3c	6.0b	0.4a
Estimated HSD	10*	0.2	1.5	0.3

\*Mean separation in columns by Tuckey's HSD ( $P=0.05$ ). HSD was calculated based on the number of observations per mean.

**Table 4.** ‘Cresthaven’ peach rootstock survival in all sites reported data for the 2017 NC140 Peach Semi-Dwarf Rootstock Evaluation Trial.

Rootstock	CO	MI	NC	NY	ONT	SC
Controller™ 6	90ab	85a	95a	85a	75bc	100a
Controller™ 7	95ab	100a	100a	90a	95ab	100a
Controller™ 8	95ab	100a	100a	75a	100a	100a
MP-29	83ab	100a	100a	90a	-	100a
Rootpac® 20	100a	95a	100a	80a	100a	100a
Rootpac® 40	73b	85a	87.5a	75a	60c	95a
Guardian®	95ab	100a	100a	80a	100a	100a
Lovell	80b	90a	100a	60a	100a	100a
Estimated HSD	20*	16	14	30	22	7

*\*Mean separation in columns by Tuckey’s HSD (P=0.05). HSD was calculated based on the number of observations per mean.*

**Table 5.** ‘Cresthaven’ peach rootstock size at planting in all sites reported data for the 2017 NC140 Peach Semi-Dwarf Rootstock Evaluation Trial.

Rootstock	CO	MI	NC	NY	ONT	SC
Controller™ 6	0.4e	0.5b	0.2f	0.4d	0.4d	0.6c
Controller™ 7	0.6e	0.5b	0.4def	0.6cd	0.9bc	0.9cd
Controller™ 8	1.1cd	0.6b	0.6d	1.0bc	0.9bc	1.5ab
MP-29	3.3a	3.9a	3.2a	1.0bc	-	1.8a
Rootpac® 20	0.8de	0.5b	0.5de	0.8cd	0.8cd	1.2bc
Rootpac® 40	0.5e	0.5b	0.4ef	1.4ab	0.6cd	0.6c
Guardian®	2.2b	1.0b	1.0c	1.8a	2.0a	1.5ab
Lovell	1.5c	1.0b	1.5b	1.6ab	1.2b	1.2bc
Estimated HSD	0.3*	0.6	0.2	0.6	0.4	0.5

*\*Mean separation in columns by Tuckey’s HSD (P=0.05). HSD was calculated based on the number of observations per mean.*

**Table 6.** ‘Cresthaven’ peach rootstock size at fall 2017 (first season) in all sites reported data for the 2017 NC140 Peach Semi-Dwarf Rootstock Evaluation Trial.

Rootstock	CO	MI	NC	NY	ONT	SC
Controller™ 6	1.1e	3.8cde	4.9c	3.3cd	2.3cd	2.6c
Controller™ 7	1.3de	1.31g	1.2d	3.5abc	2.7bcd	2.6c
Controller™ 8	1.7de	2.1fg	2.4d	4.6bc	3.1bc	2.7c
MP-29	3.7a	5.1bc	10.1b	1.9d	-	4.9b
Rootpac® 20	2.7bc	4.3cd	8.4b	3.8abc	2.0de	5.6ab
Rootpac® 40	1.6de	2.5efg	4.9c	5.9ab	1.1e	2.4c
Guardian®	3.3ab	7.3a	13.5a	7.8a	5.3a	6.6a
Lovell	2.2cd	6.8ab	12.1a	3.2cd	3.5b	5.3ab
Estimated HSD	0.6*	0.6	1.8	2.6	1.1	1.5

\*Mean separation in columns by Tuckey’s HSD ( $P=0.05$ ). HSD was calculated based on the number of observations per mean.

**Table 7.** ‘Cresthaven’ peach rootstock number of suckers after the first season in all sites reported data for the *2017 NC140 Peach Semi-Dwarf Rootstock Evaluation Trial*.

Rootstock	CO	MI	NC	NY	ONT	SC
Controller™ 6	0.0b	0.0b	0.0a	0.0b	0.0a	0.0b
Controller™ 7	0.0b	0.0b	0.0a	0.0b	0.0a	0.0b
Controller™ 8	0.0b	0.0b	0.0a	0.0b	0.0a	0.0b
MP-29	0.0b	0.0b	0.0a	0.0b	-	0.1ab
Rootpac® 20	0.4b	0.2ab	0.0a	0.0b	0.0a	1.1a
Rootpac® 40	0.2b	0.0b	0.0a	0.3ab	0.0a	0.5ab
Guardian®	0.1b	1.3a	0.0a	0.3ab	0.0a	0.9ab
Lovell	1.1a	0.0b	0.0a	0.7a	0.0a	1.1ab
Estimated HSD	0.2*	1.1	0.0	0.5	0.0	1.1

*\*Mean separation in columns by Tuckey’s HSD (P=0.05). HSD was calculated based on the number of observations per mean.*

## ***Data collection and tree management protocol***

### **At planting 2017 and during the first season**

1. Planting date should be provided in the data report spreadsheet in the allocated cells
2. Spacing should be provided in the data report spreadsheet in the allocated cells
3. Head trees at 40-50 cm above graft union to stimulate lateral branch growth.
4. Tree size: Trunk diameter in cm to nearest 0.1 cm at approximately 10 cm above graft union (Only data trees required but if all trees were measured please include them only for 2017 data report).

### **Fall/Winter 2017-18**

1. Survival; record either as dead (0) or alive (1) (only for 2017 provide survival for all data and guard trees).
1. Trunk circumference in cm (to nearest 0.1 cm) approximately 15 cm above graft union but not where there is swelling at the junction of the two scaffolds. Mark location with paint for consistency in future measurements (Only data trees required but if all trees were measured please include them only for 2017 data report).
2. Number of root suckers; count and remove. It is NOT expected to have significant suckering with these rootstocks (Only data trees required but if all trees were measured please include them only for 2017 data report).

### **Spring 2018**

1. Preselect and head, tip internal growing shoot or the ones growing in the row in order to promote growth of your potential perpendicular scaffolds
2. For the trees grown weakly tip the upper 20% of each shoot to stimulate growth.
3. Trees should not be cropped during this second year and any flowers should be removed.
4. Manage pests, nutrients, and water per local conditions and recommendations.

### **Summer 2018**

1. Manage pests, nutrients, and water per local recommendations
2. Number of root suckers; count and remove during summer.
3. Summer pruning by tipping internally grown or in the row growing shoots to promote

growth of scaffolds is REQUIRED.

### **Fall 2018**

1. Tree Survival; record either as dead (0) or alive (1), September (only data trees).
2. Tree size: Trunk circumference in cm (to nearest 0.1 cm) at approximately 15 cm above graft union preferably October (only data trees).

### **Spring 2019**

5. Julian date (i.e., calendar days) for ~90% full bloom.
6. Thin trees to a crop density (cd) of 2 fruit/cm<sup>2</sup>
7. Manage pests, nutrients, and water per local conditions and recommendations.

### **Summer 2019**

4. Julian date (i.e., calendar days) for ~10% fruit ripe for each tree (not necessarily date of first harvest).
5. Yield: total count of all commercial-sized fruit per tree and weigh them (to nearest 0.1 kg). No fruit less than 2.25 inches should be picked or counted in the yield data.
6. Mean fruit weight (g) should be calculated by dividing total commercial-sized fruit weight by the total commercial-sized fruit count per tree.
7. Firmness and % soluble solids (Brix) measurements on a 10-fruit sample per tree (optional).
8. Number of root suckers: count and remove, August. If more than 20, then **20 is the max number to record.**
9. Manage pests, nutrients, and water per local recommendations.
10. Summer pruning is REQUIRED.

### **Fall 2019**

3. Tree Survival; record either as dead (0) or alive (1), September (only data trees).
4. Tree size: Trunk circumference in cm (to nearest 0.1 cm) at 15 cm above graft union, October (only data trees).

### **2018 Data Submission Instructions**

For submission of 2018 data, **everyone is encouraged to review their data and make sure that all measurements have been reported with the requested unit. 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.

The 2018 data to be submitted and the format of the data submission are presented in the Data Report Excel spreadsheet sample provided, using the rootstock codes described in the current protocol, by **February 15<sup>th</sup>, 2019.**

**Important Notes:**

- For data submission please follow the format of the data report spreadsheet provided (by email).
- Enter a period (.) for any data not recorded or considered missing.
- All future data for a dead tree (survival=0) should be represented as missing (enter a period).
- **DO NOT** include data for replants or additional trees. Use a period in the data cells.
- Please include all data (from all years) on a single spreadsheet. Add data columns to the previous years' file and send the appended spreadsheet under the same file name every year. This guarantees consistency to the arrangement of data from year to year and greatly reduces errors. Name the data report spreadsheet file based on the provided spreadsheet sample.
- **Your data columns for your 2018 data report spreadsheet should be in the following order: tree survival (Dead (0) or Live (1) in September 2018), root sucker count, and trunk circumference (cm) at ~15 cm above graft union in October 2018.**
- **In the spreadsheet use the following rootstock codes and order:**
  1. Controller™ 6
  2. Controller™ 7
  3. Controller™ 8
  4. MP-29
  5. Rootpac® 20
  6. Rootpac® 40
  7. Guardian®

8. Lovell

**Deadline for 2018 data submission to coordinator (ioannis.minas@colostate.edu) is Feb 15<sup>th</sup>, 2019**

**In addition, and only for the establishment year please send to coordinator (ioannis.minas@colostate.edu) the following information:**

1. Planting map with N/S orientation, latitude/longitude, orchard elevation
2. Soil series information, please indicate if this site had stone fruits previously
3. Pre-plant fumigation (if so, type & rate)? Irrigation (type or method)

## **Publications**

Good Fruit Grower, February 2018. Peach rootstock trial tests options for size control: Researchers start with the roots to shrink trees. <http://flashsrv.com/goodfruit/20420/#p=22>  
<https://www.goodfruit.com/peach-rootstock-trial-tests-options-for-size-control/>