

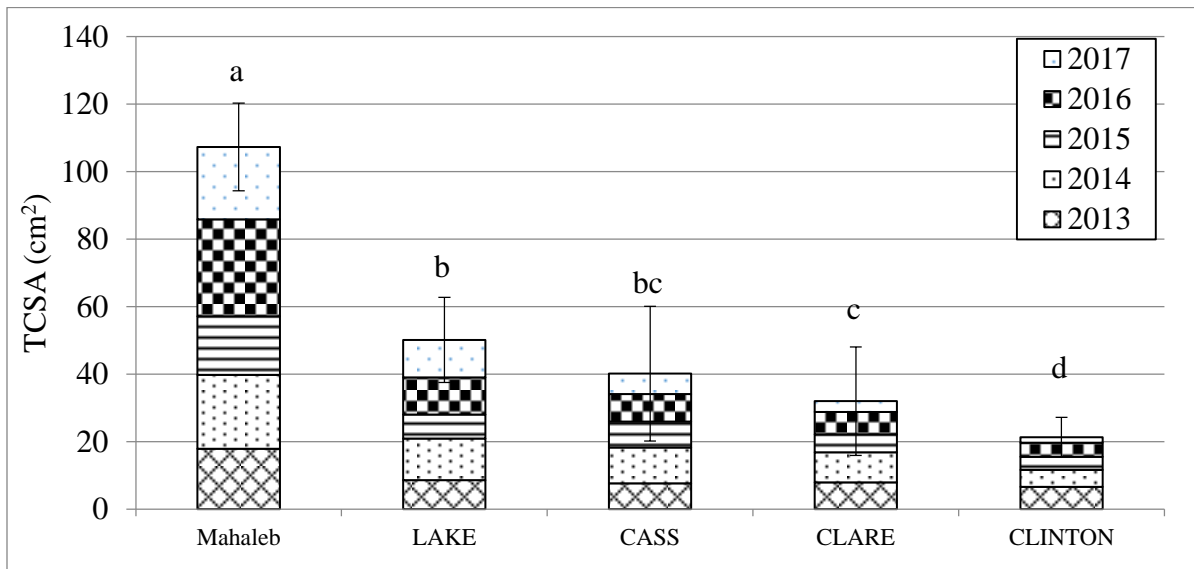
MSU cherry rootstock planting at MSU’s Northwest Horticultural Research Station

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Objective: Evaluate the MSU cherry rootstocks as potential rootstocks for Montmorency when used in high density plantings

Figure 1. Trunk cross-sectional area (TCSA; cm²) of ‘Montmorency’ trees grafted on 5 MSU rootstocks, and *P. mahaleb* for trees planted in 2011 at the MSU – Northwest Michigan Horticultural Research Center (NWMHRC) and trained to a central leader system. Boxes represent growth over one season. TCSA measurements were taken in August on the following dates: 23rd of 2013, 19th of 2014, 12th of 2015, 12th of 2016, and September 29th, 2017. Bars represent standard error of the means for 2017 TCSA^{1,2}.



¹Means that are significantly different for 2017 TCSA ($P < 0.05$) are denoted by different letters.

²The small size for Clinton in this plot is likely due to sensitivity to water and heat stress as it typically results in trees that are larger than those on Lake, Cass and Clare. New high density ‘Montmorency’ orchards using these rootstocks that were planted in 2017, are being trained using a bush system with intensive horticultural management.

Table 1a. Yield per acre (lb/ac) of ‘Montmorency’ trees grafted on 4 MSU rootstocks and *P. mahaleb* for trees planted in 2011 at the MSU – NWMHRC. Yield per acre was calculated as average yield per tree × trees per acre with 173 trees/acre¹ for *P. mahaleb* and 670 trees/acre² for the MSU rootstocks.

Rootstocks	2013	2014	2015	2016	2017	Total
LAKE	125 b ³	4573 a	9559 a	10,175 ab	22,262 a	46,694 a
CASS	156 b	4573 a	9501 a	11,036 a	19,903 a	45,169 a
CLARE	161 b	5509 a	8446 ab	5695 bc ⁴	20,439 a	40,251 ab
CLINTON	464 a	6092 a	5479 bc	2308 c	16,301 a	30,644 bc
Mahaleb	12 b	1200 b	4410 c	5166 c	13,388 a	24,174 c

¹Corresponds to 14 × 18 foot spacing

²Corresponds to 5 × 13 foot spacing

³Means that are significantly different (P < 0.05) are denoted by different letters

⁴The wide range in yields for individual trees on Clare resulted in its mean tree yield not being significantly different from that of the higher yielding Lake.

Table 1b. Yield per acre (lb/ac) of ‘Montmorency’ trees grafted on 4 MSU rootstocks and *P. mahaleb* for trees planted in 2011 at the MSU – NWMHRC. Yield per acre was calculated as average yield per tree × trees per acre with 173 trees/acre¹ for *P. mahaleb* and 990 trees/acre² for the MSU rootstocks.

Rootstocks	2013	2014	2015	2016	2017	Total
LAKE	184 b ³	6757 a	14,124 a	15,034 ab	32,894 a	68,993 a
CASS	231 b	6757 a	14,038 a	16,307 a	29,410 a	66,743 a
CLARE	174 b	8140 a	12,480 ab	8415 bc ⁴	30,202 a	59,411 ab
CLINTON	686 a	9001 a	8096 bc	3410 c	24,086 ab	45,279 bc
Mahaleb	12 b	1200 b	4410 c	5167 c	13,388 b	24,177 c

¹Corresponds to 14 × 18 foot spacing

²Corresponds to 4 × 11 foot spacing

³Means that are significantly different (P < 0.05) are denoted by different letters

⁴The wide range in yields for individual trees on Clare resulted in its mean tree yield not being significantly different from that of the higher yielding Lake.

Table 2. Fruit quality measurements of ‘Montmorency’ trees grafted on 4 MSU rootstocks and *P. mahaleb* for trees planted in 2011 at the MSU – NWMHRC. Fruit were harvested on July 21st, 2014, July 23rd, 2015, and July 20th, 2016.

Rootstock	Pull force (g) ²				SSC ³			
	2014	2015	2016	2017	2014	2015	2016	2017
Mahaleb	328 b ¹	347 a	322 b	370 a	13.8 b	13 a	14.0 ab	12.5 a
LAKE	357 ab	354 a	398 ab	387 a	14.6 ab	14 a	14.4 ab	13.6 a
CASS	376 ab	396 a	409 ab	343 a	14.3 ab	14 a	14.8 ab	13.0 a
CLARE	445 a	330 a	418 ab	343 a	14.6 ab	15 a	13.7 b	13.7 a
CLINTON	318 b	376 a	502 a	400 a	15.2 a	15 a	15.1 a	13.3 a

¹Means that are significantly different ($P < 0.05$) are denoted by different letters

²Pull force was measured from 10 fruit per tree and averaged

³Soluble solids content was measured from the bulk juice of 20 fruit

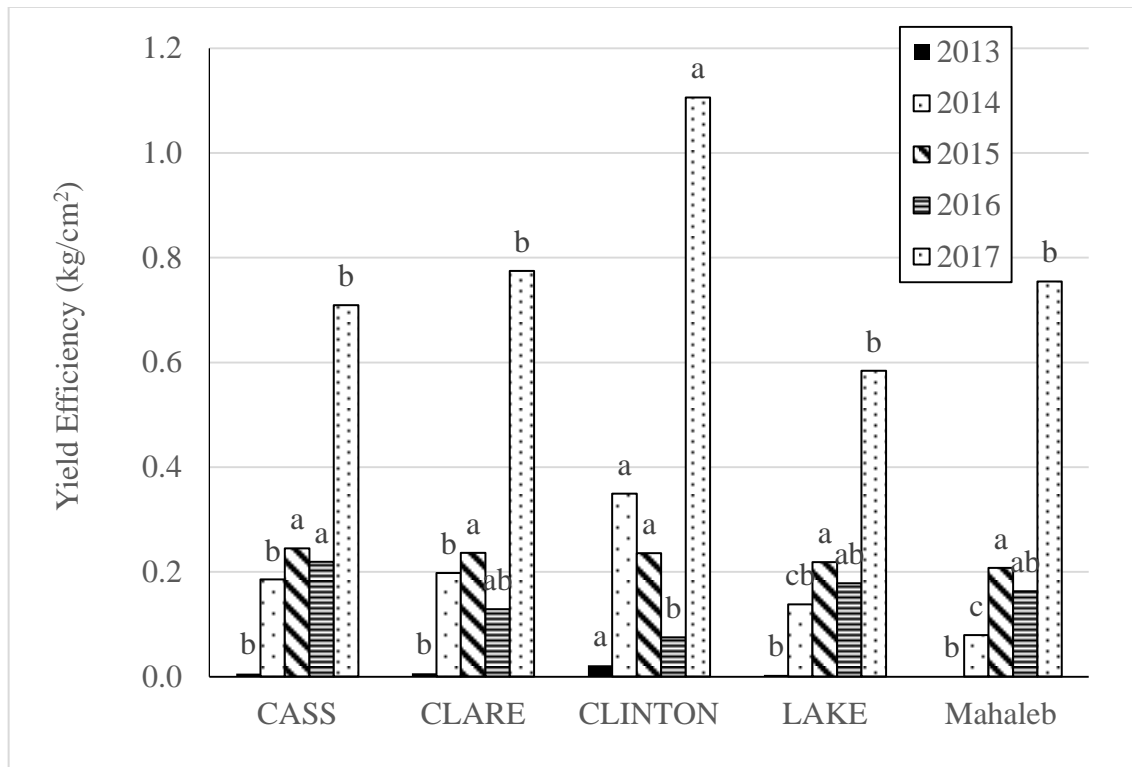
Rootstock	Fruit weight (g) ¹				Fruit firmness (g/mm) ²			
	2014	2015	2016	2017	2014	2015	2016	2017
Mahaleb	4.3 ab ³	4.0 b	5.2 ab	4.9 a	131 a	126 a	122 a	121 a
LAKE	4.5 a	4.9 ab	5.1 ab	5.0 a	125 b	123 a	122 a	119 a
CASS	4.3 ab	4.6 ab	5.3 ab	4.7 a	125 ab	126 a	120 a	122 a
CLARE	4.0 b	4.3 b	4.4 b	4.7 a	123 b	120 a	124 a	117 a
CLINTON	4.4 ab	5.3 a	5.7 a	4.5 a	123 b	125 a	122 a	252 a

¹Fruit weight was measured as the bulk weight of 20 fruit

²Fruit firmness was measured from 25 fruit per tree

³Means that are significantly different ($P < 0.05$) are denoted by different letters

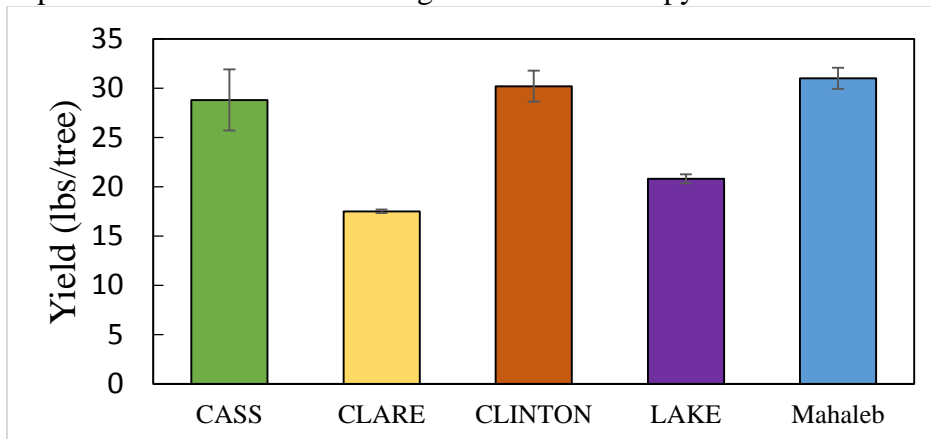
Fig. 2. 2013¹, 2014, 2015, 2016, 2017 yield efficiency (kg/TCSA) of ‘Montmorency’ trees grafted on 4 MSU rootstocks and *P. mahaleb* for trees planted in 2011 at the MSU – NWMHRC.



¹Yield efficiency (kg/cm²) for 2013 is as follows: CASS 0.006, CLARE 0.006, CLINTON 0.022, LAKE 0.003, and Mahaleb 0.001

²Means that are significantly different (P < 0.05) are denoted by different letter

Figure 3. Year 2017 yield (lbs/tree) of ‘Montmorency’ trees grafted on 4 MSU rootstocks and *P. mahaleb* and trained to a bush system. Trees were planted in 2011 at the MSU – NWMHRC in the Over the Row (OTR) - High Density Research Plot¹. Data was provided by Todd Einhorn. In 2017, trees on *P. mahaleb* reached maximum canopy height for OTR harvesting, and therefore experimental horticultural strategies to reduce canopy size of the *P. mahaleb* trees is in progress.



¹Rootstocks are planted 5 × 13 feet