Fruit Notes

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Fruit Notes

Editors: Wesley R. Autio & Winfred P. Cowgill, Jr.

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Correspondence should be sent to:

Fruit Notes
Stockbridge School of Agriculture
205 Paige Laboratory
University of Massachusetts Amherst
Amherst, MA 01003

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Cover: Young pear fruit on 6-year-old Bartlett/OHxF87 tree. Win Cowgill photo.

When to Harvest Honeycrisp: A Preliminary Evaluation of Methods?

Duane W. Greene, James Krupa, Maureen Vezina, and Jon M. Clements
Stockbridge School of Agriculture, University of Massachusetts

Honeycrisp is one of the most popular apples, not only in New England, but also nationally. But, it has a plethora of problems that have been well documented. A number of these problems can be either eliminated or their severity dramatically reduced by harvesting the fruit at the proper stage of maturity. Currently, the volume of Honeycrisp produced in the United States is insufficient to have fruit available to be stored for an extended period of time. When this happens, however, it will be important to have harvest metrics in place to provide guidance in determining the proper stage of maturity to harvest fruit that will assure high quality fruit out of storage.

DeLong et al. (2014) recently published a paper that evaluated the Delta Absorbance (DA) meter developed to determine the proper time to harvest fruit. A commercially available DA Meter (T. R. Turoni srl, Forli Italy) nondestructively measures the loss of chlorophyll from apple fruit. This loss of chlorophyll results in changing the dominant color of an immature fruit from green to varying shades of light green to yellow as fruit matures. This group of researchers in Nova Scotia conducted a series of experiments with the goal of using the DA meter to identify the appropriate fruit maturity range to harvest Honeycrisp that would result in successfully storing Honeycrisp with minimal loss due to disorders.

The purpose of this preliminary research was to evaluate the DA meter and compare the results obtained following manufacturer directions compared with other more traditional methods for evaluating fruit maturity and for determining the appropriate time to harvest Honeycrisp.

Methods

Fruit from a block of Honeycrisp/M.9 trained as a tall spindle in their fourth leaf at the UMass Cold Spring Orchard, Belchertown, MA were selected for this evaluation. Initial harvest was done on September 11, 2014. At that time, fruit from these trees had an average starch reading of about 6.0, using the Cornell Generic Starch Chart (Blanpied and Silasby, 1992). Fruit were harvested that had a light green ground color, and a portion of the fruit surface showed commercially acceptable red color. In this initial harvest, about 35 % of the fruit were harvested. Fruit from trees were taken to the lab where up to 10 fruit per tree were randomly selected for evaluation. During the evaluation process, fruit were individually marked so that the various methods of maturity assessment could be cross referenced. Fruit were visually evaluated for red color development by estimating the percent of the fruit surface with red/pink color. The ground color was then estimated using a ground color chart on a scale of 1 to 5 in 0.5 unit increments (Bulletin 750, Ground Color for McIntosh Apples, Figure 1). This chart was developed for McIntosh apples and was published in 1948. While the match was not ideal for Honeycrisp, it was sufficiently similar to be very useful and instructive. The fruit were then

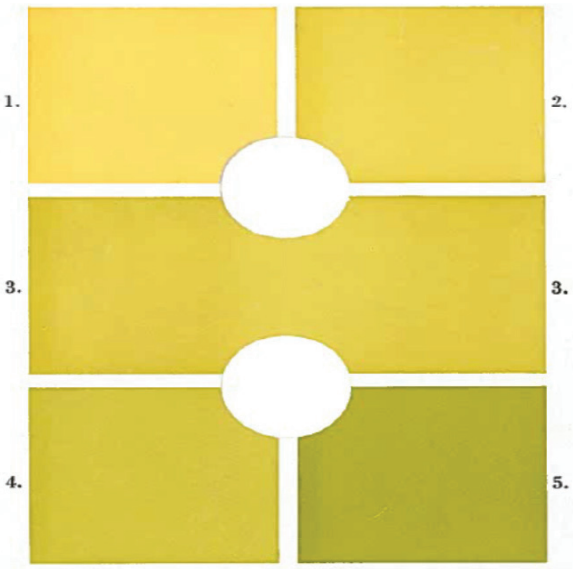

Figure 1. Ground color chart for McIntosh. Cornell Extension Bulletin 750 showing ground color of fruit ranging from immature (5) to over mature (1).

Table 1. Significance of correlation coefficients (r) between methods evaluated to assess fruit maturity of Honeycrisp apples.

Method	Red color	Background color	Internal Ethylene	DA value	Starch content
Red color	---------	0.0003		0.05	0.007
Background color	0.003	--------	0.01	0.001	0.005
Internal ethylene		0.01	---------		0.001
DA value	0.05	0.001		---------	
Starch content	0.007	0.005	0.001		---------

evaluated using the DA meter following manufactures directions by taking two readings per fruit. Data were expressed in I_{AD} units. The internal ethylene was then determined by taking an air sample from the core cavity of the fruit and then determining the ethylene content in a 1 ml sample injected in a gas chromatograph. Fruit were then cut at the equator, dipped in an iodine solution, and then after a period of development, the starch content and pattern of development were rated on a scale of 1-8 using the Cornell Generic Starch Chart.

Results

The harvest data were statistically analyzed to determine the relationship between parameters evaluated. The statistical significance of the correlation coefficients (r) is presented in Table 1. Only the correlation coefficients that were significant at P= 0.05 or greater are presented.

Data were sorted according to each parameter used to evaluate stage of maturity. Results presented in Table 2 are those that were sorted by DA reading and the number for each parameter in the table is the mean for each fruit within that DA range. The higher the DA reading the greater the amount of chlorophyll detected in the peel. Thus, fruit with higher DA readings are less mature than fruit that have lower numbers. The internal ethylene content of fruit appeared to be quite similar and thus may have limited usefulness in identifying fruit with different levels of maturity. This confirms previous published reports. The large majority of fruit had internal ethylene levels higher than 1.0 ppm threshold, the content that we generally use for most varieties to designate a fruit

Table 2. Relationship of the delta absorbance (DA) meter in I_{AD} units with other methods to assess fruit maturity (ethylene content, starch rating, fruit red color, and background color) on first-harvest Honeycrisp apples.

DA Range (I_{AD} units)	Background color (1-5)	Internal ethylene ($\mu l \cdot L^{-1}$)	Starch rating (1-8)	Red color (%)
0.91-1.00	3.1	6.1	4.9	70
0.86-0.90	3.1	7.4	4.7	55
0.81-0.85	2.7	3.0	4.7	59
0.76-0.80	2.5	7.1	5.3	66
0.71-0.75	2.3	6.3	5.3	68
0.66-0.70	2.1	7.2	5.9	72
0.61-0.65	2.1	11.3	6.3	74
0.56-0.60	2.2	7.7	6.1	68
0.51-0.55	1.8	8.5	6.0	74
0.46-0.50	1.5	6.6	6.1	76
0.36-0.45	11.8	13.1	7.2	73

Table 3. Relationship of fruit background color with delta absorbance (DA) meter and other methods to assess fruit maturity (ethylene content, starch rating, fruit red color) on first-harvest Honeycrisp apples.

Background color (1-5)	DA absorbance reading (I_{AD} units)	Internal ethylene ($\mu l \cdot L^{-1}$)	Starch rating (1-8)	Red color (%)
1.0	0.53	24.8	6.8	78
1.5	0.51	8.6	6.3	74
2.0	0.62	7.3	5.8	70
2.5	0.72	6.2	5.7	69
3.0	0.80	6.7	5.1	62
3.5	0.88	4.8	5.0	50
4.0	0.91	5.8	5.3	60

to be climacteric. There was a statistically significant relationship between ethylene and red color and starch content (Table 1). Essentially, over the whole DA range the ethylene content varied little. There was a fairly close relationship between DA reading and the ground color estimation. This is not surprising since both parameters are based upon measuring or assessing the amount of chlorophyll present in the skin.

Data were sorted according to background color (Table 3). There was a statistically significant correlation between ground color and all of the other parameters measured. Even though significant, the relationship between ground color and ethylene did not appear to be very tight and thus of questionable usefulness. There was a close relationship between background color and starch rating.

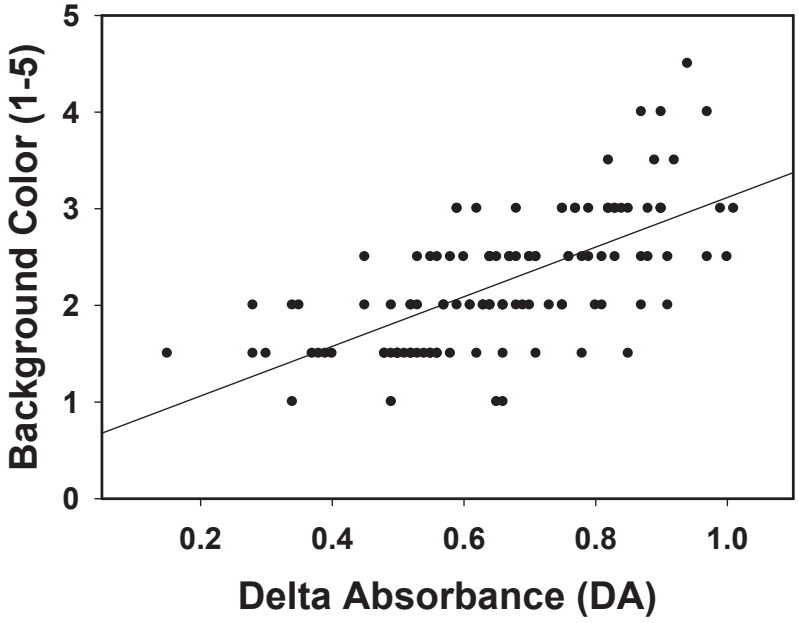

Figure 2. Relationship between Delta absorbance reading and the background color of first harvest Honeycrisp apples.

Discussion

Delong et al. (2014) suggested that fruit with a DA reading of 0.6 or higher are more prone to develop bitter pit in storage, whereas if harvest is delayed until the DA reading of fruit drops below 0.35, fruit would be more likely to develop senescent breakdown in storage. Therefore, the ideal range for orchardist to harvest Honeycrisp using the DA meter is between 0.35 and 0.60 I_{AD} units One of the most revealing aspects of this investigation was the extremely large amount of variability that was apparent when attempt-

ing to establish relationship among maturity parameters (Figures 2 and 3). Honeycrisp appears to show more variability than most varieties.

The price of the DA meter is approximately $4,000, thus prompting the question of whether purchasing a unit is a good investment, particularly for a small grower with limited acreage. The background color chart yielded about the same if not better information, and it was the only method that correlated well with all of the other methods evaluated to assess maturity. Its cost would be small and the time required to make appropriate readings would be equal to or less than the DA meter. Having ground color as a component in making a harvest decision seems like a more prudent investment than a DA meter. While the ground color chart used in this investigation probably is not readily available, colored sheets can be purchased and a ground color chart assembled with relative ease. This would not be a difficult task and an activity that seems to have merit.

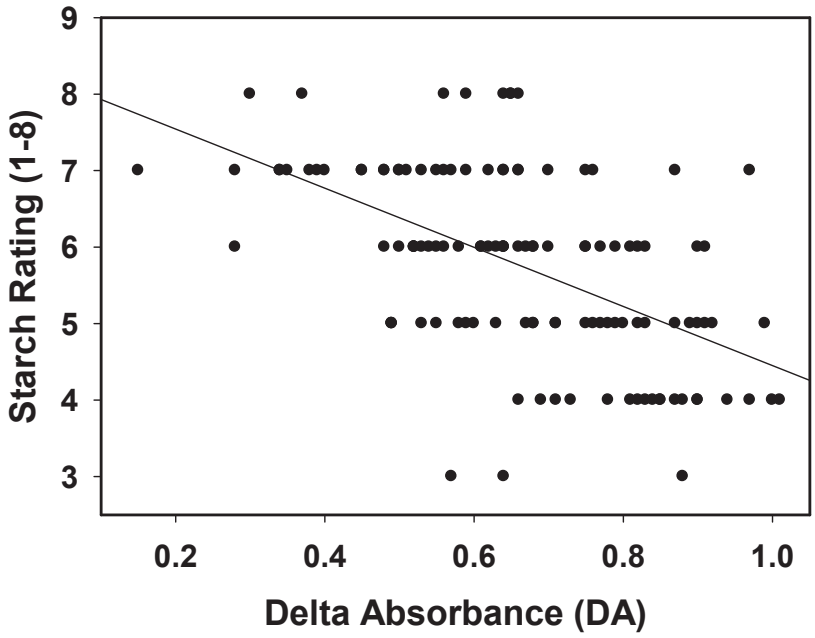

Figure 3. Relationship between background color and Delta absorbance reading of first harvest Honeycrisp apples.

We conclude that it appears that the approach that makes the most sense and would be most useful is to use more than one parameter in the decision making. We suggest sampling the block periodically and do a starch test on a representative sample of fruit. When the starch readings average about 6 on the Cornell generic starch chart, make the initial harvest by spot picking. At this time, harvest all fruit that have a background color of light green, white, or light yellow (according to the ground-color chart) that also show signs of red or pink turning to red color.

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Two New NC-140 Apple Trials: Vineland and Geneva Rootstocks with Honeycrisp and Fuji at Rutgers Snyder Farm

Win Cowgill and Rebecca Magron
New Jersey Agriculture Experiment Station

Jon M. Clements and Wesley R. Autio
University of Massachusetts

Two new apple rootstock plantings were established at the Rutgers Snyder Research and Extension Farm, Pittstown, Hunterdon County, NJ. These plantings are part of the NC-140 Regional Rootstock Research Project (http://nc140.org). Objective 1 is "To evaluate the influence of rootstocks on temperate-zone fruit tree characteristics grown under varying environments using sustainable management systems." In this case, the growth and productivity of Honeycrisp and Fuji apple trees on Vineland and Geneva apple rootstocks are being evaluated. The 2014 trials are located in 18 states and Canadian Provinces.

This Vineland-Geneva planting is being coordinated by Dr. John Cline, University of Guelph, Ontario, Canada. Vineland rootstocks were bred as open-pollinated hybrids of Kerr crabapple and M.9 rootstock at the Vineland Experiment station in

From Left to Right- Win Cowgill, Rutgers, Art Grimes, Master Gardener and Dave Johnson, Master Gardner plant the 2014 NC140 Honeycrisp trial with a Phil Brown transplanter at the Rutgers Snyder Farm. Ed Dager, Snyder Farm Supervisor operated the tractor. Photo Credit: Rebecca Magron.

Table 1. Characteristics of Fuji trees on various rootstocks in the 2014 NC-140 Apple Rootstock Trial in year one. Rutgers Snyder Farm, Pittstown, NJ.

Rootstock	Spring trunk cross-sectional area (cm^2)	Branches (no.)	Height of graft union (cm)	Fall trunk cross-sectional area (cm^2)	Fall-Spring change in trunk cross-sectional area (cm^2)
G.11	1.4 bcd	12.3 a	11.9 a	2.6 bcd	1.2 a
G.202	0.8 d	2.7 c	8.1 abcd	1.7 d	0.9 a
G.214	1.4 cd	4.6 bc	10.5 abc	2.4 cd	1.0 a
G.30	2.5 a	11.3 a	11.4 ab	3.8 a	1.5 a
G.935	1.9 abc	8.1 ab	10.3 abcd	3.3 abc	1.4 a
M.26EMLA	1.4 cd	2.5 c	11.6 ab	2.5 cd	1.1 a
M.9T337	1.3 cd	11.5 a	9.5 abcd	2.6 bcd	1.4 a
V.1	2.1 ab	8.5 ab	10.0 abcd	3.8 a	1.7 a
V.5	2.2 a	12.8 a	6.8 d	3.8 a	1.5 a
V.6	2.4 a	12.0 a	8.9 abcd	3.8 a	1.4 a
V.7	1.8 abc	9.9 a	7.5 cd	3.5 ab	1.7 a

Means within columns not followed by a common letter are statistically different at odds of 20 to 1.

Table 2. Characteristics of Honeycrisp trees on various rootstocks in the 2014 NC-140 Apple Rootstock Trial in year one. Rutgers Snyder Farm, Pittstown, NJ.

Rootstock	Spring trunk cross-sectional area (cm2)	Branches (no.)	Height of Graft Union (cm)	Fall trunk cross-sectional area (cm^2)	Fall-Spring change in trunk cross-sectional area (cm^2)
B.10	1.67 bc	11.0 cd	9.6 b	3.32 bcde	1.65 bc
G.11	1.07 ef	5.6 ef	14.2 a	2.93 de	1.87 abc
G.202	1.01 f	5.0 f	12.1 ab	2.71 de	1.71 abc
G.214	1.53 cd	19.8 a	12.3 ab	3.14 de	1.60 c
G.30	2.19 a	21.1 a	12.5 ab	4.82 a	2.64 ab
G.41	0.94 f	5.3 ef	12.6 ab	2.54 e	1.60 c
G.935	0.99 f	5.5 ef	15.0 a	2.62 e	1.63 c
G.969	1.35 cde	12.2 bcd	13.3 ab	3.71 bcd	2.36 abc
M.26EMLA	1.39 cde	7.6 def	13.5 a	3.33 bcde	1.93 abc
M.9T337	1.21 def	7.9 def	13.3 ab	3.24 cde	2.02 abc
V.1	2.27 a	10.6 cd	11.4 ab	4.33 ab	2.06 abc
V.5	1.43 cd	10.4 cde	11.6 ab	3.48 bcde	2.04 abc
V.6	2.04 ab	17.4 ab	12.3 ab	4.36 abc	2.32 abc
V.7	1.55 cd	13.5 bc	11.4 ab	4.34 abc	2.77 a

Means within columns not followed by a common letter are statistically different at odds of 20 to 1.

Vineland, Ontario. They include V.1, V.2, V.3, V.4, V.5, V.6, and V.7. V.1 is already commercially available and is similar in vigor to M.26. V.3 is more dwarfing but is not yet commercially available. V.4 will not be commercialized, as may be the case for V.2 also. V.5, V.6, and V.7 are largely untested, although it is known V.5 and V.6 are dwarfing, while V.7 is a semi-dwarf. Vineland rootstocks are purported to be very cold-hardy and display field-resistance to fire blight. V.1 and V.3 have been tested in previous NC-140 plantings and have performed well.

Geneva rootstocks are better known and more widely available, although supply has been constrained to date. For more information on the commercially available Cornell-Geneva rootstocks, see: http://www.cctec.cornell.edu/plants/GENEVA-Apple-Rootstocks-Comparison-Chart-120911.pdf

The two 2014 NC-140 Vineland and Geneva apple rootstock planting with Honeycrisp and Fuji were planted April 23, 2014, at the Rutgers Snyder Farm. Both trials have V.1, V.5, V.6, V.7 and various Geneva stocks with M.9 NAKBT337 and M.26 ELMA as the controls. See the data tables for the complete list.

Trees were supplied by Willow Drive Nursery. Tree spacing is 1 x 4 m. The experimental design is a randomized complete block. Trees were trained and supported as a tall-spindle-apple. Drip irrigation was installed shortly after planting. Tree growth was excellent on the Honeycrisp trial, but the Fuji trees sat still until late July. This seemed to be the case across the other planting sites in North America. The Fuji trees supplied were very large and had very few roots. Our consensus was the trees had to make new roots before top growth could occur. In year two, the Fuji trees are off and running.

Shortly after planting in April, measurements were made of trunk circumference at 30 cm above the graft union, number of side branches greater than10 cm long, and tree height. In October after tree growth had ceased, measurements were made of trunk circumference at 30 cm above the graft union, height of graft union above soil, number of side branches greater than10 cm long, and tree height.

Results

At the end of the 2014 growing season, the largest trees as measured by trunk cross-sectional area (TCA) were on G.30, V.1, V.5, and V.6 all with a TCA of 3.8 cm^2 (1.5 $inches^2$). The smallest trees were on G.202 at 1.7 cm^2 (0.7 $inches^2$).

There was lot of variability in the number of feathers on each tree; V.5, V.6, G.11, M.9 NAKBT337, and G.30, in order, had the most, V.5 with 12.8 feathers. G.202 had the fewest with 2.7.

At the end of the 2014 growing season, the largest trees as measured by TCA were on G.30 followed by V.6, V.7, and V.1. The smallest trees were on G.41, G.935, and G.11.

The Honeycrisp trees had more feathers overall and grew better in 2014. G.30 had the largest number of feathers with 2,1 and G.202 had the smallest with 5.

Favorite Cherry Varieties: Grower Observations

Presented as a Panel at the 2013 Mid-Atlantic Fruit and Vegetable Conference, Hershey PA

Win Cowgill, ***New Jersey Agricultural Experiment Station***
Justin Weaver, ***Grower- Weaver's Orchard, Inc.***
Tom Hass, ***Grower- Cherry Hill Orchards***
Gary Mount, ***Grower-Terhune Orchards***
Evan Milburn, ***Grower- Milburn Orchards***

Four outstanding growers from three states, New Jersey, Maryland and Pennsylvania spoke on a grower panel at the Mid-Atlantic Fruit and Vegetable Conference, Hershey PA in 2013. They shared their combined 170 years plus of sweet cherry cultivar knowledge with 150 other farmers.

Each grower was asked to address seven questions, I will list each question separate and list their responses.

1) ***Describe your orchard operation, location, acres, what do you grow, how do you market your cherries, etc.***

a. Weaver's Orchard - http://www.weaversorchard.com/. We are located in Morgantown Pa-Berks County. Our farm is around 100 acres: approximately 25 apple, 22 peach, 13 cherry (2A tarts), 5 other tree fruits, 12 berries, the remainder pumpkins, tomatoes asparagus etc. We have a Farm Market on the property open year round. We also do pick your own. Wholesale accounts for around 20% of our total sales.

b. Cherry Hill Orchards - http://www.cherryhillorchards.com/. We are located in Lancaster, PA 17603 Lancaster County. We grow 40 acres of peaches and nectarines. 40 acres of apples. 3 acres of plums and apricots 23 acres of cherries as well as sweet corn and face pumpkins. Our cherry ,peach and apples are all geared towards our pick your own customers needs. In addition we have an orchard outlet that offers our fruit ready picked and is open year around. Additionally, We ship apples to Hess Brothers Fruit Company and Knouse Foods as needed. We spot pick all our trees for maturity and color multiple times for peak flavor.

Jubileum tart cherry. Win Cowgill photo.

c. **Terhune Orchards -** http://www.terhuneorchards.com. Our farm is about 200 acres in Princeton, NJ. We are best known for apples, but grow 36 different crops--many varieties of each. We sell almost 100% direct marketing with some deliveries to restaurants in our area. Also included are greenhouse crops, including lettuce and flowers throughout the winter, bakery and winery--our latest venture. We have been pioneers in using farm festivals to promote the farm and sell our crops. All the land we farm is permanently preserved and we are pleased to have the next generation of our family committed to continuing the farm. We are recently working on succession and estate planning. We have two acres of cherries--first planting in 1996 with additions and replacements since then. We sell pick your own only-our crop is normally picked and sold in less than one day. A really large crop might take us into the next morning. With a small orchard, I would prefer to have all varieties ready to pick at the same time. So, Montmorency and Regina have marks against them for that--it is hard to keep pickers out of them even though they are not ready yet.

Sweeheart sweet cherry. Win Cowgill photo.

d. **Milburn Orchards -** http://www.milburnorchards.com/. Our farm is located in northeastern Md,outside the town of Elkton. Located 3 miles east of Delaware and 3 miles south of PA. We are extremely diversified with all kinds of tree fruit, table grapes and other small fruits. Marketing all this by all methods, plus entertainment farming. Of this 400 acres plus, 27 acres are planted to sweet cherries and a few tarts. 12 acres of these are 25 years old,the others were planted in 2010. All 27 acres are 95% PYO.

2) ***What are you favorite cherry varieties, sweet and tart if you grow them? Top ten max?***

a. **Weaver's Orchard --** In no particular order: Rainier, Benton (yield consistency?-replace w/ Ebony Pearl?), Regina (yield consistency is a big problem- not sure where that will lead), Attika (yield consistency? For now Hedelfingen, Skeena?), Sweetheart (but only in high tunnels as it cracks- very late), Sandra Rose (bad cracker, spring freeze?), Cavalier/Rynbrandt (replace w/ Black Pearl, maybe Kiona?), Royalton (Replace w/ Burgundy Pearl?), Balaton (tart), Montmorency (tart), and Jubileum (my personal favorite tart to eat is but I haven't proven it to be a sound winner yet!). There are freeze concerns based on 2010 and 2012: Summit-both years, Sandra Rose-both years, Black Gold-both years, Benton-both years, but less in 2010, Hartland-both years but less in 2012, Ulster-both years but less in 2010, and Hudson-both years but less in 2010. Many others had some damage, but these stood out.

b. **Cherry Hill Orchards --** Hedelfingen, Vernon, Summit, Emperor Francis, Rainier, Ebony,

Black Pearl, Burgundy Pearl, Black York, Attica, and Regina.

c. **Terhune Orchards --** Rainier is our favorite sweet. That is, it is our customer's favorite. We have 75% Asian pyo customers, and they just cannot get enough of a yellow blush cherry. We choose our picking date by when they will be ready. Montmorency is our tart; I thought they would be hard to sell, but they are very popular. We try to keep pickers out until the next weekend. Other favorites are: Somerset, Hartland, Chelan, and Schmidt. Regina and Lapins are poor for us -- they look good but do not taste good.

d. **Milburn Orchards --** Many varieties were planted in the older planting. Learning from these, only 6 varieties were chosen for the new planting in 2010: two whites and four reds, all early or mid-season. No more late ones were planted because of the falling prices the big chains charge for Washington cherries being shipped in that that time: our $3.50 vs their $0.99. For PYO people the red ones are of "the Bing family", the white ones are "the Rainier family." Galaxy is the only tart cherry planted, it ripening with the mid-season sweets. These are heavy producers on a semi-dwarfing, spreading tree. The earlier tart varieties have less production, and Montmorency is too late. These are my sweets in ripening order: Hartland (extremely productive, spreading tree, and a great pollinator; can be a cracker in rainy times), White Gold (I call it a smaller Rainier; great taste, great blush, great pollinator), Summit (HUGE, dark red, best taste, highly productive, no negatives), Van-del-lay (coal black, self fertile, sweet ripens with Summit, can over produce resulting with smaller cherries), Emperor Francis (an old standard white but best for this season), and Regina (BEST sweet grown on the east coast, dark red, long stems, crunchy, late bloomer, very little cracking; negatives are very vigorous tree making it hard to train and needs late blooming varieties for pollination; for pollination I wedged in trees of Gold and Black Gold at every eighth tree, in every row; it is not as productive as other varieties). Many, and I mean many, rootstocks and varieties are always planted in our test blocks. G.6 is and will be our chosen one for our needs. The only exception could be G.5 for the Regina.

Danube tart cherry. Win Cowgill photo.

3) ***What is the predominate rootstock you are growing on now? or which one do you like now or one that is promising and you will use more on future plantings.***

a. **Weaver's Orchard --** We have at least seven rootstocks on the farm. New plantings are mostly G.5 and G.6, and we are starting to evaluate G.3. As a general rule: these are heavy croppers (most self fertile varieties) go on G.6 and lighter croppers go on G.5. Location, soil vigor, desired tree height, and pruning methods can dramatically effect final tree size.

b. **Cherry Hill Orchards** -- Older trees are on Mazzard. Newer plantings are G. 5. We have some MxM and some Krymsk stocks. The G.5 works well for us, because they are self standing if they are kept open. We maintain the tree height at 8' by mechanical topping after harvest.

c. **Terhune Orchards** -- I plant all Gisela stocks. In 1994 and 1995 when I was ordering, they were called Gissen 148-1, 148-8, and 148-2. Then the names were changed to Gisela with a different numbering system, and I have been confused ever since. I have G.5, G.6, and G.7. G.7 is not sold anymore, because root suckering is a problem. G.5 is not my favorite, because it is too weak for heavy bearing and it results in small fruit, which are not a problem for pyo but are not as tasty as they could be. G.6 works well for me because of the heavy soil in the orchard site, and it has enough vigor to carry a crop. It is not as precocious and heavy bearing as I would like.

d. **Milburn Orchards** -- Many, and I mean many, rootstocks and varieties are always planted in our test blocks. G.6 is and will be our chosen one for our needs. The only exception could be G.5 for Regina.

Montmorency tart cherries. Rebecca Magron photo.

4) ***List of varieties that have tried and have not worked for you***

a. **Weavers Orchard** -- Sam, Schmidt, Early Robin, Sunset Bing, Royal Ann, Summit, Napolean, Ulster, Black Gold, Index, Chelan, Anderson, White Gold, and probably more.

b. **Cherry Hill Orchards** -- Sam, Stella, Lappins, Royal Anne, and Schmidt. Decay issues on self fruitful varieties as well as lousy flavor are problems.

c. **Milburn Orchards** -- Varieties no longer planted: Sam, Royalton, Somerset, Kristen, Vouge, Cavalier, Star, Vista, Lapins, Sweetheart, Bing, Rainer, and any other varieties bred on the West coast, including BC (with very few exceptions). All are extreme crackers in our climate. Some of these might be fine with high tunnels.

5) ***Grown in tunnels or outside?***

a. **Weaver's Orchard --** We have approximately 3.5 acres in tunnels and 7 acres outside.
b. **Cherry Hill Orchards --** All are planted outside.
c. **Terhune Orchards --** I have Haygrove tunnels over the entire 2 acres. These were constructed after losing the entire crop one year when heavy rain for 4 days the week before harvest split every cherry so badly we never picked a single one. A tunnel is an absolutely necessary, in my opinion.
e. **Milburn Orchards --** All 27 acres are planted outside.

6.) ***What type of production system, i.e. central leader, Spanish bush?***

a. **Weavers Orchard --** Mostly a central leader type tree, that is, we use Weaver modified version of the Greg Lang/ Lynn Long pruning methods found on the website www.giselacherry.com. We have had some trees in almost every other system around: UFO, Bi-lateral, super spindle, modified Marchant, KGB, Spanish Bush, Tall open center, etc.
b. **Cherry Hill Orchards --** Our trees are more toward a Spanish bush. Multiple leaders make canker management easier. We hand prune after harvest.
c. **Terhune Orchards --** We use a central leader.
d. **Milburn Orchards --** Although the new UFO system was real temping (one small row is in our experimental block), we chose the modified VOGEL system in our new plantings (google vogel cherry system). All are planted 8x16, stopped at 8-9 feet high, on ridges for fast growth. All are supported with a short post for the first 4-5 years. It is very labor intense for the first 5 years but is highly productive.

7.) ***How do you decide on new varieties to try?***

a. **Weaver Orchards --** We try almost everything.
b. **Cherry Hill Orchards --** Nursery and NY State recommendations.
c. **Terhune Orchards --** Plant more Rainier, but evaluate other crops first. I was going to remove an asparagus field (partly pyo) in order to plant more cherries. A pencil and paper showed me I was making more with asparagus.
d. **Milburn Orchards --** We maintain a test block of everything we can get out hands on!

Uncle Win's Baleton tart cherry pie. Win Cowgill photo.

Who Buys New Jersey Peaches and Where?

Pegi Adam
Consultant, New Jersey Peach Promotion Council

With the New Jersey peach season approaching the New Jersey Peach Promotion Council has commissioned and released a statewide poll of New Jersey registered voters on their peach purchases during the 2014 season. The survey found nearly half (47%) purchased New Jersey peaches last summer. Women (54%) were more likely than men (41%) to purchase New Jersey peaches, and buying patterns varied depending on region (south, central, northwest, northeast, and urban core). The poll, conducted by Fairleigh Dickinson's PublicMind, was designed to provide unbiased information for the New Jersey Peach Promotion Council to aid its marketing and promotional efforts. Survey questions covered the areas of purchasing venues (supermarkets, pick-your-own farms, on-farm stands and community farmers markets); in what media purchasers saw ads or editorials for New Jersey peaches; and visits to the website www.jerseypeaches.com

The largest overall percentages of Jersey peach purchasers were from south (58%) and northwest (54%); 37% were from the urban core. Purchase venues were widely diverse, with supermarkets higher in northern areas (50% in the urban core) than in southern areas (23% in the south), and on-farm purchases higher in the south (44%) than the urban core (15%). On-farm purchases were also quite strong in the northwest (42%) and central (40%). Aside from the survey, several supermarket produce buyers have reported that their customers request "Jersey-grown peaches" as soon as the peach season starts in late June.

"We were a bit surprised at the discrepancies of regional purchase practices," said Jerry Frecon, Rutgers professor emeritus, stone fruit specialist and consultant to the New Jersey Peach Promotion Council. "But the results will definitely provide guidelines for our marketing and promotional efforts going forward."

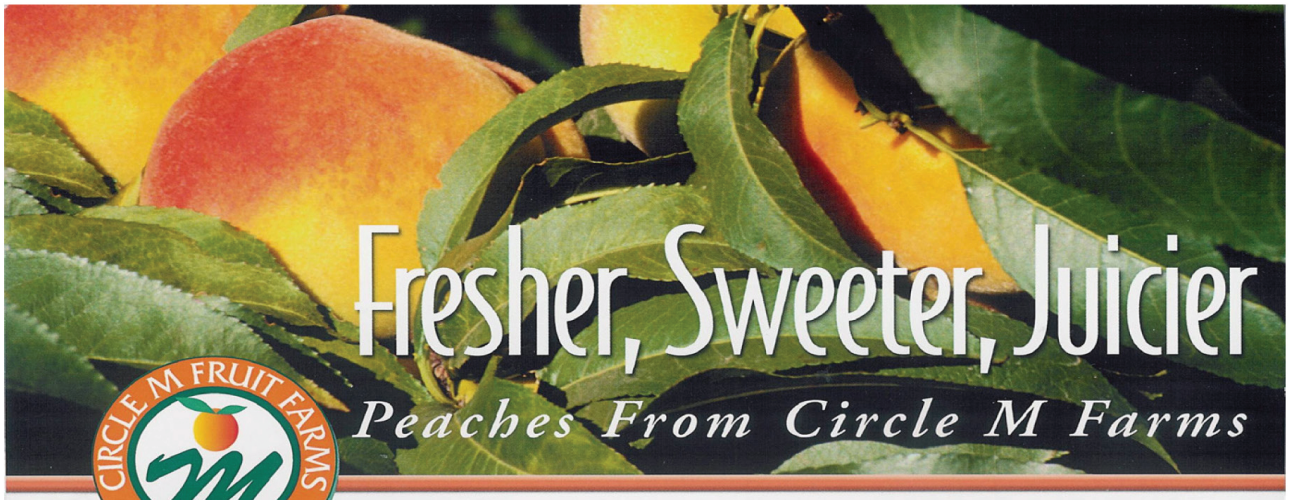
Where did poll respondents report seeing media coverage of New Jersey peaches? While only 24% of total respondents reported seeing any media coverage, the highest percentage of views overall were in newspapers or magazines, with southern New Jersey respondents reporting the highest such views (55%), followed by the northeast and northwest(both 49%). Thirty-two percent saw New Jersey peaches covered on television.

"Despite the fact that our website has received many hits (232,737 in 2014), the poll showed only two percent of respondents had visited the site in the past 12 months," continues Frecon. "We plan to make that site much more visible in the 2015 season."

Survey Methodology

The most recent survey by was conducted by telephone from September 1 through September 7, 2014 using a randomly selected sample of 801registered voters who reside in New Jersey. One can be 95 percent confident that the error attributable to sampling has a range of +/- 3.5 percentage points. The margin of error for subgroups is larger and varies by the size of that subgroup. Survey results are also subject to non-sampling error. This kind of error, which cannot be measured, arises from a number of factors including, but not limited to, non-response (eligible individuals refusing to be interviewed), question wording, the order in which questions are asked, and variations among interviewers. These Fairleigh Dickinson University PublicMind interviews were conducted by Opinion America of Cedar Knolls, NJ, with professionally trained interviewers using a CATI (Computer Assisted Telephone Interviewing) system. Random selection >is achieved by computerized random-digit dialing. This technique gives every person with a landline phone number (including those with unlisted numbers) an equal chance of being selected.

The New Jersey Peach Promotion Council is a non-profit voluntary organization of growers, shippers, wholesalers and associated industries dedicated to maintaining a viable peach industry in the Garden State for the purpose of preserving farmers and farmland; and providing the highest quality and best tasting fresh peaches for consumers. New Jersey is the fourth largest peach producing state in the country, with approximately 80 orchards on 5,500 acres, producing 60-66 million pounds, valued at $30-35-million. Details on support and membership are available at www.jersey peaches.com.



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