

Harvest Maturity Report #10



October 9th, 2013

**Craig J. Kahlke, Area Extension Educator, Fruit Quality Management
Cornell Cooperative Extension – Lake Ontario Fruit Program
Cell phone: (585) 735-5448; email: cjk37@cornell.edu**

This is the tenth Apple Maturity Report for the 2013 harvest season. Reports will be sent out every week (usually Wednesday afternoons), with supplemental reports during peak season if needed.

Overall Issues:

The unpredicted rains, gusty winds, some very warm days, and unseasonably warm evenings most of the past week have not helped us very much. The good news is if you can believe the forecast, much of the next week looks to bring dry weather with highs in the 60's and 70's and lows mainly in the 50s, perhaps some nights into the 40s, with a mix of sun and clouds. **With harvest peaking now as many varieties are coming into the harvest window at nearly the same time, plus many folks falling behind- the main message is to prioritize your picking, concentrating on first harvesting the blocks that are going to give you the largest potential returns. Work closely with your field men, marketers, and storage operators to try and make the most informed decisions possible.**

Internal ethylene levels have really come up in most samples I looked at this week, but the cooler temps in the forecast should help keep drop-susceptible varieties on the tree. However, monitor closely.

- **Empire** –Fruit are starting to soften. The mid and longer-term CA windows are closing for most blocks that remain to be harvested in Western NY. Prioritize by picking your highest-value and best quality fruit first. See pages 2-3.
- **Red Delicious** – As with most other varieties, the weather in the past week did little to help final coloring in most Red blocks I looked at. If you have quality Empire still to be harvested, Reds can likely wait. But continue to monitor your blocks, especially if you have a history of preharvest drop and you've not applied a stop-drop material. As usual, watercore and moldy core are prevalent. **See pages 3-4.**
- **Golden Delicious**- Most Golden's I've seen this week have the flavor and color to be at or harvest for fresh, depending on the requirements of your markets. **See pages 5-6.**
- **Jonagold**- First spot-picking completed for most. Monitor your blocks every 2-3 days and work in picking with Empire and other varieties if your fruit meet color requirements for the fresh market. Some of the blocks I looked at this week still needed final coloring and size, while others were ready. Regardless, fruit are getting softer and blocks should be monitored closely. **See page 5.**

- **Ruby Frost (Formerly NY2)** – Sugars have climbed higher than expected and flavor is surprising good already. Young trees in early sites in our territory can likely be harvested this weekend into early next week. Other heavier cropped and older trees along with later-maturing-sites can probably wait a week or more. Some older blocks and those from heavier cropped blocks could benefit from final coloring. Keep in mind this is a tarter apple with a mild flavor that is likely near its peak. More testing next week. **See page 6.**
- **Crispin** – The fruit I looked at were grass-green but were developing flavor. Unless your market wants very green fruit with no color break, this variety can likely wait a while in favor of other higher priorities. **See page 7.**
- **Law Rome** – I only looked at one sample this week. The bleeding of the red anthocyanin skin pigments into the flesh have put this variety out of favor for the fresh market and processing/sauce market as well. However, this variety is quite desirable for the fresh slice market. Fruit treated with Retain have been shown to have reduced incidence of flesh bleeding. Retain-treated fruit with a starch index of around 3 and pressures in the 20-22 pound range are being harvested now for the fresh slice market. There will be no testing of this variety this year.

Empire – Prioritize remaining fruit

Most Empire samples that I looked at this week had pressures that were still surprisingly good, but time is ticking on remaining fruit being acceptable for mid and long-term CA. Varietal flavor and color is really excellent this year.

Continue to do frequent walk-throughs and to work closely with your marketer to prioritize picking of Empire based on what type of market/storage it is destined for.

Suggested guidelines for CA are starch of 4.2-4.6 (minimum 3.5, 5 is over-mature), and pressures greater than 17 pounds (or 14 for short, 15 for mid, and 16 for long-term CA, according to Phillip Schwallier at MSU Extension). Export pressure requirements may be higher.

It is important to work closely with your marketer in selecting the right destination for your fruit. For instance, minimum total soluble solids (brix) for export to the UK is 12%. Fruit will usually not gain more than 0.5% brix in storage, so do not harvest fruit for export below 11.5% in this case. Please be aware that there is a lot of variability in brix and other maturity indices, from block to block, within blocks, and also from fruit to fruit. Sample the correct sized fruit from the block (or portion of the block) that you are targeting for a particular market.

From Dr. Chris Watkins at Cornell – research now over several years indicates that the number 1 defense against internal flesh browning is early harvest. We're obviously past harvesting Empire early at this point but think about it for next year. Last year's data showed fruit picked a week ahead of normal harvest did show a reduction in packout; however, the fruit had very low levels of browning, even in

June and July. We realize this may bump some of your Empire into an already busy harvest window, but prioritize early Empire harvest next season if you want to store fruit in long-term CA.

6 untreated Empire blocks tested in Western NY on October 7-8, 2013

Index	Oct. 7 & 8, 2013		Sept. 30 & Oct. 1, 2013		Sept. 30 & Oct. 1, 2013		Oct. 3 & 4, <u>2011</u>	
	untreated		untreated		Retain		untreated	
	Average	Range	Average	Range	Average	Range	Average	Range
	n=6		n=10		n=7		n=8	
Firmness (lb.)	16.1	14.1-16.8	16.6	15.5-17.5	17.2	16.4-18.2	15.9	15.1-16.6
Soluble Solids (%)	12.0	10.4-13.2	11.2	9.0-13.2	11.6	11.2-12.1	11.7	9.0-13.2
Starch Index	5.2	4.6-5.9	4.1	3.4-5.2	3.8	3.1-5.7	4.1	2.9-4.7
Ethylene (ppm)	11.24	0.02-51.18	3.23	0-11.16	0.06	0-0.13	13.86	0.23-29.02
Producing > 0.5 ppm ethylene	37% (22/60)		18% (16/90)		5% (3/60)		44% (35/80)	

Red Delicious – Near/ready for harvest, but can wait for most

As mentioned on page 1, the weather of the past week did not help with final coloring of Reds. In addition, most samples I looked at the past 2 days still needed sugars and varietal flavor to come up. Some also needed final sizing. Starch to sugars conversion also seems to be moving very slowly. Keep in mind when performing a starch iodine test, do not include fruit with a moldy seed core- these fruit will have much higher starch index values than sound fruit. Cortland, Macoun, Red Delicious, and Cameo all have high incidences of moldy core. There was also a high number of moldy core apples in this week's

samples. Watercore in Reds is also on the rise, and this can be expected to continue. Some markets have specific requirements on what they tolerate.

Because Reds are a drop-susceptible variety with a picking window that overlaps a lot of other high-volume varieties, many growers are treating their Reds with Retain. Internal ethylene rose quite a bit in the past week; however the cooler forecasted weather should help fruit stick. There are few reports of drop at this time. However, monitor your blocks closely.

Recommended firmness for CA storage is 16 pounds for short-term, 17 pounds for mid-term and 18 pounds for long-term CA, according to Phillip Schwallier of MSU Extension. The recommended starch index is 2.8-3.5, with 5 considered over-mature; **however** keep in mind starch levels seem falsely high in many varieties this year, but Reds may not be one of them.

- **Telling the difference between “PUSH-OFF” and “DROP”:**
 - PUSH-OFF – fruit is missing stems, has flat spots or limb creases
 - DROP – fruit is loose on tree, fruit has stems

6 untreated Red Delicious blocks tested in WNY on October 7 & 8, 2013

Index	Oct. 7 & 8, 2013		Sept. 30 & Oct. 1, 2013		October 3 & 4, 2011	
	untreated		untreated		untreated	
	Average	Range	Average	Range	Average	Range
	n=6		n=9		n=7	
Firmness (lb.)	18.1	17.1-19.5	18.0	16.6-19.5	17.7	17.2-18.4
Soluble Solids (%)	11.1	10.3-11.9	9.3	7.9-10.6	10.9	8.0-12.7
Starch Index	2.7	2.2-3.0	2.6	1.8-2.9	2.2	1.9-2.7
Ethylene (ppm)	6.31	0.03-27.42	0.12	0-0.36	4.75	0.07-14.83
Producing > 0.5 ppm ethylene	35% (21/60)		9% (8/90)		20% (14/70)	

Jonagold – First pick should be complete for most

Variation is what I saw in Jonagolds this week. Some fruit were definitely ready for picking while others lacked color requirements and full varietal flavor. However, firmness was definitely declining fast. Remember, **Jonagold is a spot-picked variety**. The fresh market requires 50% color, and starch ranges are recommended at 7.0-7.5. Again, the starch values may be falsely higher this year. **Watch out for greasiness, which indicates overmaturity.**

4 Jonagold blocks tested in WNY on October 7 & 8, 2013

Index	Oct. 7 & 8, 2013		Sept. 30 & Oct. 1, 2013		Oct... 3 & 4, <u>2011</u>	
	Average	Range	Average	Range	Average	Range
	n=4		n=4		n=4	
Firmness (lb.)	15.4	14.8-15.8	16.2	15.8-16.7	15.8	14.9-17.0
Soluble Solids (%)	12.5	11.4-14.1	12.6	11.6-13.9	11.2	10.3-12.2
Starch Index	7.7	7.5-7.8	6.3	5.5-7.0	6.7	6.1-7.4
Producing > 0.5 ppm ethylene	50% (10/20)		Not tested		15% 12/30	

Golden Delicious – Some blocks ready for fresh, depending on market requirements

The Golden's I looked at the past two days did not have the nicest color, but nearly all had good varietal flavor and pressures in an acceptable range for harvest. Harvest will be determined by development of acceptable color, depending on market. **Look for background color change from green to green-yellow to yellow.** There is less bruising with this variety if harvested more mature.

Recommended firmness for CA storage is above 15 pounds for short-term, 16 pounds for mid-term, and 17 pounds for long-term CA, along with a starch index between 3 and 5, with 5.5 being over-mature, according to Phillip Schwaller of MSU Extension. Again, the starch values in Golden's this year do not

match up with varietal flavor, color, brix and firmness so I would not use them as major criteria for when to harvest.

7 Golden Delicious blocks tested in WNY on October 7 & 8, 2013

Index	Oct. 7 & 8, 2013		Sept. 30 & Oct. 1, 2013		October 10, 2011	
	Average n=7	Range	Average n=7	Range	Average n=4	Range
Firmness (lb.)	15.9	14.8-17.0	17.3	15.1-20.0	17.6	16.5-18.3
Soluble Solids (%)	13.0	10.2-15.3	13.0	11.1-14.7	13.8	12.8-14.2
Starch Index	6.4	5.4-7.3	4.5	3.0-6.3	5.3	4.3-7.0
Ethylene (ppm)	4.09	0-12.93	Not tested		0.75	0.03-4.02

Ruby Frost (Formerly NY2) – Evaluate on a block-by-block basis, do not harvest until full varietal flavor is present

Based on past year's testing (the crazy 2012 season not included), it was thought that this low browning Autumn Crisp X Braeburn cross would be a later October variety. However, nearly all fruit I sampled this week had very good to excellent flavor. This is a tarter apple that does not have a very strong flavor- but this year it is very good. In addition, internal ethylene came way up on this variety, when in the past it has stayed low until late October. Some samples (mainly from older plantings or over-cropped trees) could use final color change and sizing. Second-third leaf plantings on earlier sites can likely harvest this weekend into early next week. Later-maturing sites and older trees can likely wait until the middle of next week or later. Ruby Frost is not susceptible to preharvest drop but over-ripe fruit can develop greasiness. That being said, we have not seen any greasiness yet and don't anticipate it will come on quickly. Therefore, as with SnapDragon, wait until flavor peaks for these tree-ripened fruit to be delivered to farm markets. A note on picking, if the spurs are coming off when you harvest, this is a sign that the fruit are not ready for harvest. As a reminder, we are still trying to establish maturity guidelines for this new and promising variety. Therefore this is a learning process - developing maturity indices and harvest windows for the correct storage and markets, and observing/trying to solve problems encountered.

10 Ruby Frost blocks tested in WNY on October 7 & 8, 2013

Index	October 7 & 8, 2013		October 3 & 4, <u>2011</u>		October 17-18, <u>2011</u>	
	Average	Range	Average	Range	Average	Range
	n=10		n=5		n=3	
Firmness (lb.)	19.6	16.8-21.5	17.8	17.0-18.5	16.8	16.5-17.1
Soluble Solids (%)	12.8	10.8-14.9	11.0	9.9-11.9	12.5	12.3-12.8
Starch Index	4.6	3.6-6.4	3.8	2.2-5.1	6.5	5.8-7.5
Ethylene (ppm)	0.88	0.04-2.75	0.10	0.06-0.14	0.05	0.03-0.08
Producing > 0.5 ppm ethylene	47 % (42/90 apples)		2% (1/50 apples)		0% (0/30 apples)	

Crispin/Mutsu – Harvest based on market requirements

6 Crispins tested in Western NY on October 7 & 8, 2013

Index	October 7 & 8, 2013		October 3 & 4, <u>2011</u>		October 5 & 6, <u>2009</u>	
	Average	Range	Average	Range	Average	Range
	n=6		n=6		n=6	
Firmness (lb.)	18.3	17.3-19.9	18.9	18.4-19.6	19.6	18.6-21.0
Soluble Solids (%)	12.2	9.5-14.4	10.8	9.2-12.0	11.8	10.8-12.8
Starch Index	2.6	1.6-3.6	3.2	2.2-4.6	2.7	2.4-3.3
Ethylene (ppm)	0.50	0-2.11	NT	NT	0.12	0.08-0.16

Crispin sampled this week were all very green and little color break was seen. However, size is excellent and most were developing very good flavor. Work with your marketer to determine color requirements- some markets like Crispin still green, and some want the color break from green to yellow.

Reminders

In some varieties, starch values seem to be falsely higher than actual maturity. The weather during the growing season may not have allowed a lot of carbohydrate buildup in the fruit. Therefore, starch movement is faster than normal, and fruit may not be as mature as starch indexes may indicate. Look at varietal flavor, firmness, and color as well.

Please follow recommended maturity indices for each variety in addition to consulting with your marketer. Make sure there is adequate varietal flavor prior to harvest. **While I realize inventories are very low and the large demand for fresh apples have marketers screaming for fruit, picking under-mature fruit will only kill repeat sales.**

Please know your different strains- a highly coloring strain is not necessarily more mature than an older, lesser coloring strain. Although color change is usually one of the best indicators for this variety, keep in mind that varietal flavor is also extremely important.

Variation between individual blocks and orchards always occur. Because of this inherent variation, the average maturity index readings of several grower blocks (as developed by the regional testing program) has often provided a better guide to harvest than readings from individual orchards. BE SURE TO CONSULT WITH YOUR MARKETER – **before harvesting the block.**

Crop load effects maturity. Trees with lighter crop loads, along with stressed trees (i.e. drought and frost damage/loss) and very young trees usually mature earlier. Maturity is usually delayed in trees carrying a larger crop

Cooling fruit as soon as possible following harvest is critical in maintaining quality!

The harvest maturity report for next week (10/16) will focus on testing data of Red Delicious, Ruby Frost (formerly NY2), and Crispin (Mutsu). Testing will be finishing on the above along with Retain-treated Empire, and will start on Idared, Cameo, and Fuji.

As always, your comments and suggestions are always appreciated via email or cell phone.

Every effort has been made to provide correct, complete, and up-to-date pesticide recommendations. Nevertheless, changes in pesticide regulations occur constantly, and human errors are still possible. These recommendations are not a substitute for pesticide labeling. Please read the label before applying any pesticide.

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