

Harvest Maturity Report #9



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This is the ninth 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.

- **Empire** – Peaking now for long-term storage. Varietal flavor has really come on in the past week, while pressures are remaining high. Pick early for long-term CA to reduce your risk of internal flash browning. See pages 2-3.
- **Red Delicious** - This is a year that you can likely wait on Reds until the lion's share of Empire are harvested. Most blocks I looked it were at least a week from harvest (non-Retain fruit). Keep an eye on them though, as this is a drop-susceptible variety. **See page 4.**
- **Cortland** – The CA window is closing soon for this variety. Although they hang well on the tree, the fruit are softening and storage potential is shrinking. Color is excellent and so is size and flavor. **See pages 5-6.**
- **Macoun** – Unless your fruit are treated with Retain, harvest should be at or nearly finished for any longer-term storage potential. I only looked at three samples this week, and two were ready for harvest.
- **SnapDragon (Formerly NY1)** – Most fruit from this new low volume variety on young trees was harvested for farmer's markets late last week or early this week. Flavor, size, color, and firmness are excellent. For future tree-ripened sales, its seems this variety does not drop prematurely nor does it develop greasiness. So it would not hurt to leave it on the tree a bit longer if desired. See page 5 for more info.
- **Golden Delicious**- Brix levels are surprisingly very high already for this variety, and the starch index looks to be falsely high. Look at background color – most fruit I looked at had very little color break and the varietal flavor needs further development for the fresh market. Most fruit destined for long-term storage, depending on color requirements, can wait until at least next week. **See page 7.**
- **Jonagold**- As with Goldens, Jonagold has unusually high brix levels and starch to sugars conversion. However, fruit are still very green and need final coloring, sizing, and varietal flavor development. First pick fruit destined for long-term storage can wait until next week. **See page 6.**
- **Ruby Frost (Formerly NY2)** - Fruit are surprisingly well-colored and sized already. There is some starch movement as well. However, internally the fruit are quite green and are lacking good flavor. The 2 samples I looked at consisted of an older test planting and a young 2nd leaf planting. The brix levels were around 12%, the starch index was about 3, and the pressures were 21-23 pounds. More testing next week.

Overall Maturity Issues:

If the 5-10 day weather forecast proves correct, varieties that are at or very close to harvest may not develop full varietal color. Warm days, warm nights, and cloudy weather are not helpful for coloring fruit. However, the prevailing weather pattern of the past few weeks has really helped color fruit such as Cortland & Empire. This is a reason to obtain higher-coloring strains when you can. Unfortunately maturity will not be held back. Don't delay if fruit are softening. You may need to harvest some blocks that don't have ideal color. As you know, many varieties are coming into the harvest window about the same time. Work with your marketers and field men to prioritize harvest. Growers should monitor individual blocks every 2-3 days.

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.

Weather Forecast for the Western NY fruit belt, it looks like continued unseasonably warm weather through Sunday with a mix of clouds and sun, and significant chances for showers Thursday, Friday, and Sunday. Temps are showing highs in the 70s and lows only in the 60s and upper 50s through the weekend. Monday looks to usher in fall again, with forecasted high temps in the 60s, lows in the 50s at night, and plenty of sun. Let's hope the extended forecast proves true, as this will help in assuring great quality to finish up later varieties.

Empire – Peaking now for fruit with long-term storage potential

Nearly every sample of Empire I looked at could be picked within a few days. Color and size are excellent, flavor and brix are high, and firmness is very good.

It is time 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. Overall, internal ethylene was still low but detectable in many samples, indicating they are ready for harvest.

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.

10 untreated and 7 Retain-treated Empire blocks tested in Western NY on September 30 and October 1st, 2013

Index	Sept. 30 & Oct. 1, 2013 untreated Average Range n=10		Sept. 30 & Oct. 1, 2013 Retain Average Range n=7		Sept. 23 & 24, 2013 untreated Average Range n=9		Oct. 3 & 4, 2011 untreated Average Range n=8	
	Firmness (lb.)	16.6	15.5-17.5	17.2	16.4-18.2	16.9	16.1-17.5	15.9
Soluble Solids (%)	11.2	9.0-13.2	11.6	11.2-12.1	9.9	8.2-11.8	11.7	9.0-13.2
Starch Index	4.1	3.4-5.2	3.8	3.1-5.7	3.4	3.0-3.8	4.1	2.9-4.7
Ethylene (ppm)	3.23	0-11.16	0.06	0-0.13	0.05	0-0.22	13.86	0.23-29.02
Producing > 0.5 ppm ethylene	18% (16/90)		5% (3/60)		4% (3/80)		44% (35/80)	

From Dr. Chris Watkins at Cornell – research now over several years indicates that the number 1 defense against internal flesh browning is early harvest. 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 if you want to store fruit in long-term CA.

Red Delicious – Harvesting beginning next week for most

Nearly all untreated samples I looked at this week needed more flavor. Some also needed final sizing/coloring. Starch levels seem falsely higher. 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.

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. Some significant internal ethylene was measured in a few untreated fruit this week, but there are no 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 this variety this year.

- **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

9 untreated blocks tested in WNY on September 30th & October 1, 2013

Index	Sept. 30 & Oct. 1, 2013		October 3 & 4, 2011		September 28-29, 2009	
	Average	Range	Average	Range	Average	Range
	n=9		n=7		n=3	
Firmness (lb.)	18.0	16.6-19.5	17.7	17.2-18.4	18.2	17.9-18.8
Soluble Solids (%)	9.3	7.9-10.6	10.9	8.0-12.7	10.6	9.6-11.7
Starch Index	2.6	1.8-2.9	2.2	1.9-2.7	1.6	1.4-1.9
Ethylene (ppm)	0.12	0-0.36	4.75	0.07-14.83	1.07	0.04-2.25
Producing > 0.5 ppm ethylene	9% (8/90)		20% (14/70)		17% (5/30)	

SnapDragon (formerly NY-1) – Make sure your fruit are fully tree-ripened for farmer’s markets

I finished SnapDragon sampling for the season by looking at a number of samples again this week. There were no signs of over-mature fruit. Flavor remained excellent. **The sweet spot for picking tree-ripened fruit on young trees this year seemed to be from about September 26 through about now (October 2).** I encourage growers to leave a few fruit on trees longer to periodically check how they respond.

Fruit that pull off the tree quite easily when they are being twisted for harvest seem to be a good indicator of harvest readiness. Less colored fruit are hard to pull off. Internal ethylene levels remained fairly low, so perhaps that’s not a great indicator for our target markets at this point.

9 SnapDragon blocks tested in Western NY on September 30 & October 1, 2013

Index	Sept. 30 & Oct. 1, 2013		Sept. 23 & 24, 2013		Sept. 16 & 17, 2013		Sept. 26 & 27, 2011	
	AVG. n=9	Range	AVG. n=12	Range	AVG. n=7	Range	AVG. n=6	Range
Firmness (lb.)	17.8	16.2-20.0	18.7	17.6-20.2	18.4	15.8-19.7	17.1	16.2-17.9
Soluble Solids (%)	13.7	12.2-14.8	12.8	11.1-15.2	11.6	10.0-13.0	12.5	11.1-13.9
Starch Index	5.3	3.8-6.7	3.7	2.8-4.5	2.7	2.0-4.1	4.7	3.9-5.7
Ethylene (ppm)	5.00	0.03-23.56	1.32	0.15-3.76	0.98	0.02-3.78	5.85	1.04-15.26
Producing > 0.5 ppm ethylene	23% (14/60 apples)		36% (43/120 apples)		14% (10/70 apples)		53% (32/60 apples)	

Cortland – Peaking now for CA, be aware of softening fruit

Cortland are ready for most. Since they do not prematurely drop, they may get overlooked in favor of higher-priority fruit. Be aware of reduced storage potential if you delay harvest. Recommended firmness for CA storage is above 14 pounds for short-term, 15 pounds for mid-term, and 16 pounds for long-term CA, according to Phillip Schwallier of MSU Extension. Be aware of rapid maturation; however, as Cortland can move through the suggested long-term CA starch index range of 2.5-3.5 quite quickly- but keep in mind starch levels seem falsely high this year.

Keep in mind when performing a starch iodine test, do not include fruit with a mold seed core- these fruit will have much higher starch values than sound fruit. Cortland, Macoun, Red Delicious, and Cameo all have high incidences of moldy core.

5 Cortland blocks tested in Western NY on September 30 & October 1, 2013

Index	Sept 30 & Oct. 1, 2013		Sept 23 & 24, 2013		Sept 26 & 27, 2011		Sept 21 & 22, 2009	
	Average	Range	Average	Range	Average	Range	Average	Range
	n=5		n=11		n=12		n=8	
Firmness (lb.)	14.9	13.1-15.7	16.0	15.5-16.8	15.0	14.6-15.3	15.9	14.0-17.1
Soluble Solids (%)	11.6	11.2-12.1	11.3	8.7-13.6	12.7	10.8-14.2	11.8	9.9-12.6
Starch Index	4.3	3.5-6.6	2.5	1.3-3.8	1.8	1.0-2.7	1.3	1.0-1.6
Ethylene (ppm)	Not tested		3.47	0.06-15.15	0.43	0.03-1.55	0.17	0.12-0.22

Jonagold – First pick sometime next week for CA for some

I was surprised to see brix at around 13-14% in some samples, and starch indices near 7. However, full color break and varietal flavor were still lacking. First pick can likely wait until sometime next week for most blocks. 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.** Recommended firmness for CA storage is above 15 pounds for short-term, 16 pounds for mid-term, and 17 pounds for long-term CA, according to Phillip Schwallier of MSU Extension.

4 blocks tested in WNY on September 30 & October 1, 2013

Index	Sept. 30 & Oct. 1, 2013		September 26-7, 2011		September 28-29, 2009	
	Average	Range	Average	Range	Average	Range
	n=4		n=4		n=8	
Firmness (lb.)	16.2	15.8-16.7	17.1	16.6-17.5	16.3	15.1-18.4
Soluble Solids (%)	12.6	11.6-13.9	12.2	11.1-13.3	12.8	11.4-14.2
Starch Index	6.3	5.5-7.0	4.6	3.9-5.0	5.8	3.8-7.8
Ethylene (ppm)	Not tested		0.54	0.02-1.40	0.43	0.07-1.07

Golden Delicious – Coming into the harvest window, especially for processing

Goldens are being accepted for the processing market at this time. As with Jonagold, brix levels are surprisingly high. For fresh market, brix and starch levels are rising, and fruit is coming into maturation. However, little color break has been seen in the samples I looked at. 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 bring over-mature, according to Phillip Schwallier of MSU Extension. Again, the starch values in Goldens this year do not match up with varietal flavor, color, brix and firmness so I would not use them as a major criteria for when to harvest.

7 blocks tested in WNY on September 30 & October 1, 2013

Index	Sept. 30 & Oct. 1, 2013		October 3 & 4, 2011		Sept. 28 & 29, 2009	
	Average n=7	Range	Average n=5	Range	Average n=5	Range
Firmness (lb.)	17.3	15.1-20.0	17.6	16.4-18.4	16.6	15.2-17.8
Soluble Solids (%)	13.0	11.1-14.7	13.4	10.9-15.1	13.2	11.9-14.7
Starch Index	4.5	3.0-6.3	4.2	4.0-4.6	4.5	4.0-4.9
Ethylene (ppm)	Not tested		1.66	0.11-5.92	0.42	0.01-1.87

Reminders

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 (10/9) will focus on testing data of Red Delicious, Jonagold, Golden Delicious, and Ruby Frost (formerly NY2). Testing will be finishing on Empire, and will start on Crispin (Mutsu).

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

Harvest maturity report subscription reminder – tell a friend. Call or email Kim Hazel to subscribe at 585-798-4265 ext. 26, krh5@cornell.edu.

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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