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Healthy Fruit

Prepared by the University of Massachusetts Fruit Program

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http://www.umass.edu/fruitadvisor/healthy_fruit/

The way I see it

It's pretty quiet out there with most everyone taking a bit of a breather before apple harvest starts. The exception is peach growers, who are entering the peak of the season. That is marked by Redhaven harvest in my opinion, these exceptional fruit being harvested this week. Size and quality of the peach crop have been excellent this year, however, brown rot control should be on your mind. Jerseymacs have been picked and I expect Paulared harvest to begin next week if not sooner. Gingergold will follow within a week of Paulared. This year I would watch maturity closely, and for two things -- early and uneven maturity. Careful spot picking is going to be the norm. The starch-iodine test is useful for helping to assess apple maturity. Applications of ReTain on apples will be taking place during the next two weeks. ReTain has many benefits, including reducing drop, more uniform fruit maturity, and higher fruit firmness. It is worth applying ReTain to most high value apples, particularly those prone to pre-harvest drop. I would also be sure to maintain good summer fungicide coverage with all the rain we have had recently, and fruit rots could become an issue if the weather stays the course. But, it looks like we are in for a spell of cool nights, and relatively dry, warm days, so that is all good. J. Clements

Apple maggot fly may be active

Although I don't maintain any apple maggot fly (AMF) traps, reports from the Hudson Valley have been of high numbers. This makes sense given the moist soil conditions we have had of late. Apple maggot fly populations vary greatly from location to location, but it is safe to say most orchards will continue to need some insecticide protection through the end of the month. (Using red sticky-ball traps and monitoring is really the only way to determine if you have an AMF problem.) Later harvested fruit will need to be protected into mid-September. Softer, early-maturing fruit are most susceptible to AMF injury. Following is a comprehensive list of available apple maggot fly control options and their efficacy, reprinted from the *2007 Michigan Fruit Management Guide*. J. Clements

Apple maggot fly insecticides, efficacy, and pre-harvest interval

Insecticide (rate/acre)	Efficacy	Pre-Harvest Interval (days)
Diazinon 50 WP (4 lb)	good	21
Guthion 50 WP (2 lb)	excellent	14
Imidan 70 WP (3 lb)	excellent	7
Lannate 90 SP (1 lb)	good	14
Sevin 80 S (5 lb)	fair	3
Asana XL 0.66 EC (8.0 - 14.5 fl oz)	good	21
Danitol 2.4 EC (10.6 - 21.3 oz)	good	14

Spintor 2SC (6 - 10 oz)	fair	7
Surround WP (25 - 50 lb) ♦	excellent	0
Assail 30 SG (6 - 8 oz)	excellent	7
Calypso 480 SC (6 - 8 oz)	excellent	30
Entrust 80 WP (3 oz) ♦	fair	7
Warrior 1 CS (3.4 - 5.12 oz)	good	21
GF120 NF Fruit Fly Bait (10 - 20 oz) ♦	fair	NA
Decis 1.5 EC 0.9 - 1.9 oz)	good	21
Baythroid XL (1.4 - 2.8 oz)	good	7
Battalion 0.2 EC (7 - 14.1 oz)	good	21

♦ *organic certified*

If you got mites

As with apple maggot fly, mite populations have been sporadic and orchard-specific in occurrence. Although it is getting late to treat, if you have a mite problem now it will probably persist into harvest, and if bad enough, contribute to early drop and just be a nuisance at harvest. Two-spotted spider mites are worse in this regard. So, if you have not recently treated and are noting any foliage bronzing or more than just a few mites per leaf, you might want to treat this week. Again, reprinted from the *2007 Michigan Fruit Management Guide*, here are insecticide options. J. Clements

Miticides, efficacy, and pre-harvest interval

Insecticide (rate/acre)	Efficacy	Pre-Harvest Interval (days)
Kelthane 50 WP (4 - 8 lb)	fair	7
MPEDE (1% v/v) ♦	fair *	0
Vendex 50 WP (1 - 2 lb)	good	14
Vydate 2L (4 pt)	good	14
Danitol (10.6 - 21.3 oz)	good	14
Nexter 75 WSB (5.2 - 10.67 oz)	good-excellent	25
Acramite 50 W (0.75 - 1.0 lb)	good-excellent	7
Zeal 72 WDG (2 - 3 oz)	excellent	28
Kanemite 15 SC (31 oz)	good-excellent	14
Envidor 2 SC (16 - 18 oz)	excellent	7
Fujimite 5 EC (2 pt)	good-excellent	365 **

** can be used with marginal control product like Kelthane to markedly increase efficacy; do not use alone for mite control, although it is an option for organic orchards*

*** non-bearing trees only*

Painless and Efficient Apple Maturity Testing

Starch Iodine testing is among the best and easiest indicator of apple maturity that a grower can use to plan their harvest and storage regimes. But, our observation has been that few growers utilize the Starch Index (SI) method of determining harvest maturity. Perhaps SI testing is perceived as time consuming and difficult to properly judge?

Why is it important to perform SI testing? First, as mentioned, the SI method is probably the best way

to judge fruit maturity without expensive equipment. The Sl technique, wherein the starch to sugar ratio is measured, is correlated with ethylene evolution. In fact, ethylene synthesis occurs as fruit ripens. Therefore, the SI index is an inexpensive way to assess the degree to which fruit has converted starch to sugar, and is indicative of the onset and progress of ethylene production.

Secondly, because SI is a reliable indicator of relative fruit maturity, SI testing can help you determine if harvested fruit should be placed in early CA, late CA, or regular cold storage. Remember that, as a rule, fruit with SI readings of 3-4 are suitable for late CA, apples measuring 4-6 on the SI scale are best for early CA, and any fruit reading 6 or above should be placed in regular cold storage or marketed immediately. Of course, reliability in using the SI method for determining apple maturity is predicated on good sampling techniques, i.e.; looking at fruit that has sufficient size and color. Or, in other words, sample apples that you expect are approaching harvest readiness.

Note: Apples going into late CA (available in April-June, etc.) should not average less than 15 lbs. firmness.

Guides

Cornell University has developed a universally accepted chart that is useful for all varieties. Cornell has this publication available with maturity chart to help you use the starch-iodine test and to develop an apple maturity program. The publication also contains a laminated starch iodine chart to aid in interpreting the tests. I strongly suggest that anyone seriously interested in harvesting high quality apples with good storage potential buy a copy of this publication, "Predicting Harvest Date Windows for Apples (1992)" Information Bulletin 221.

Full-color plates show how to use and interpret the starch-iodine test for determining maturity and the best harvest dates for quality, especially important for apples going into storage. Covers McIntosh, Cortland, Empire, Delicious, Mutsu/Crispin, and Idared; dates for other varieties can be interpreted from the information presented. 20 pages.

This publication can be ordered directly from Cornell University by calling 607-255-2080 and using a Master Card or VISA credit card to pay for the pub.
Note: this publication may no longer be available, but can be downloaded here:

- http://hdl.handle.net/1813/3299

Specific starch charts have also been developed for Gala, Empire, and Liberty for use in the Northeast. On the West Coast they have also been developed for Fuji and Braeburn. Jon Clements and I have posted these charts on the web that can be downloaded and printed for your use at:

- http://www.umass.edu/fruitadvisor/clements/articles/sitest.htm

Wilson Irrigation located in Washington State also has Maturity Photo Charts for sale for Gala, Fuji, Braeburn, Golden Delicious, Granny Smith, and D'Anjou pear. Call 1-800-232-1174 or order from their web site at http://www.wilsonirr.com.

Testing method

Having tested tens of thousands of apples over the years, per numerous experimental protocols, we can now suggest a simple, quick and efficient method for evaluating orchard-by-orchard or block-by-block SI apple samples. Here is our quick and simple testing technique:

- Equipment consists of a one quart hand-operated spray bottle filled with SI solution, a pocketknife, and a Starch Index chart. The most thing is to just use the chart and begin sampling and testing the fruit two weeks before anticipated harvest to get a baseline on the maturity. (If you need SI solution, get in touch with us and we will make you some for a modest fee.)
- The procedure is simple--pick a sample of apples that appear ready to harvest, based on size,

color, days after full bloom, and taste. Spray the SI solution on longitudinally halved fruit, wait one to one and one-half minute and make your readings based on the SI chart. The whole process is portable, quick, simple, and saves Sl solution compared to dipping individual apple in a solution filled pan.

It is important to keep good records on your maturity determinations by cultivar and block. You will start to build a good database of harvest maturity information for your orchard.

SI caveats

Although the SI test is a reliable gauge of many cultivars, such as McIntosh, Empire, Jonathan, Golden Delicious and Macoun, some cultivars do not respond as well to the SI test, and should be monitored using other methods. Maturity cultivars, including Gala, Fuji and Honeycrisp should also be gauged using background color, soluble solids, and flesh firmness.

Background color is a particularly good maturity indicator on Gala and will provide the grower with an accurate maturity reading. Red skin color, flesh firmness and sugar content are not as reliable indicators of fruit maturity as background color on this cultivar. Fruit should be harvested for optimum long-term storage quality when the background color of the fruit is changing from a green to yellow color. After that, the background color changes from yellow to cream. It is at this stage that the fruit is ready for immediate sales or short-term storage. Galas will require multiple pickings for optimum fruit quality. Background color is also a good indicator of maturity for Fuji. J. Clements and W. Cowgill (Rutgers Cooperative Extension)

Leaf analysis reminder

Just a quick reminder it is probably not too late to collect leaf samples for foliar nutrient (plant tissue) analysis. But I would do it this week. Complete procedure and instructions for submitting to the UMass Soil and Plant Tissue Testing Laboratory can be found at the link below. J. Clements

- http://www.umass.edu/soiltest/list_of_services.htm

Note: Healthy Fruit is now on a once every two weeks publication schedule. The next HF will be published in approximately 2 weeks.