



Healthy Fruit

Volume 13, 2005

Prepared by the University of Massachusetts Fruit Team

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Upcoming Meetings/Events

Date	Meeting/Event	Location	Time	Information
December 13-15, 2005	New England Vegetable and Fruit Conference	Center of New Hampshire Radisson Hotel, Manchester, NH	--	Duane Greene, 413-545-5219

Apple maturity report

Here are the results (and continued on page 3.) from recent apple maturity testing of ‘early fall’ apples.

Note that in this block of Honeycrisp at the UMass Cold Spring Orchard in Belchertown, red spot-picked fruit are fully mature and that pre-harvest drop was significant. Be advised to keep a close eye on Honeycrisp, and spot-picking by color is definitely advised for this week. If drop seems to be a problem, an NAA application (see following article) may be advisable, however, little testing has been done on Honeycrisp. Remember to store Honeycrisp at temperatures around 36-40 F. and/or allow to ‘condition’ for a day or two outside (in a cool, shady place) before putting in storage to help prevent soft scald. Earlier-picked Honeycrisp are *less* susceptible to soft scald than later picked. Honeycrisp will need two harvests (minimum) based on color and size.

Marshall McIntosh that had not been treated with ReTain was also experiencing some drop, however, it is likely part of normal push-off. Still, don’t dally and keep up with early harvest. Use NAA where appropriate to temporarily slow drop. Monitor drop and fruit ‘looseness’ on a block-by-block basis to manage and maximize harvest.

Gala are also ready for a first-pick this week – key on the background color change from green to yellow to cream, and good varietal (fruity) flavor.

Overall, relatively seasonal weather should allow us to get the apple harvest off to a good start. Apple maturity test results will also be posted on the UMass Fruit Advisor as they become available:

- <http://www.umass.edu/fruitadvisor/clements/articles/2005harvest/2005harvest.html>

Getting the most from that “old” stop-drop:NAA

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The use of NAA (Fruitone N, K-Salt Fruit Fix) for control of preharvest drop has been overshadowed in recent years by that of ReTain; however, ReTain use must be planned weeks prior to harvest. With the effective application time so close to the onset of drop, NAA offers a “rescue” treatment, should the threat of preharvest drop be increased due to unforeseen circumstances. Examples of such situations include unavoidable delays in harvest due to bad weather or labor issues, slow red color development, and overlapping harvest schedules of varieties with similar maturity windows, such as McIntosh with Macoun, or Empire with Delicious. While it is not the purpose of this article either to promote or condemn the use of ethephon (Ethrel, Ethephon II) to promote fruit coloring, those growers using one of these products also need to use NAA to prevent excessive fruit drop resulting from accelerated fruit maturation. The following tips and reminders are offered to help growers brush up on using NAA to best effect.

Timing NAA stop-drop sprays is a little like a game of chicken, requiring both steely nerves and a good understanding of your opponent. The label says to apply NAA when the first sound fruit begin to drop. A single spray of 10–20 ppm NAA offers drop control for about seven days from the date of application, but it takes two or three days to “kick in”. Apply NAA three days too early and the window of effective drop control is about halved. Apply three days too late and perhaps a quarter of the crop will be on the ground before the NAA takes effect!

Stem loosening coincides with the climacteric rise in ethylene that signals fruit ripening. Unlike ReTain, which delays drop by delaying fruit maturation, NAA stops drop by delaying stem loosening. Predictive degree-day models and the pattern of starch disappearance measured by the starch index test do not provide a precise guide to timing NAA stop-drop sprays. These techniques can indicate whether the threat of drop is earlier or later than normal, but more direct monitoring is required for the actual timing of the sprays.

Varieties such as McIntosh that are highly susceptible to preharvest drop require careful monitoring to determine when fruit drop is beginning. Limb tapping should be used to determine the onset of drop as fruit near maturity. Bump several scaffold limbs of three or four inches in diameter throughout the block on a daily basis. Use the palm of your hand with a short firm stroke, striking the limb at its mid-point (just like golf, this skill improves with practice and experience). If zero to one apples per limb drop on average, it’s too soon to apply NAA. If the average is about two, check again later the same day or the next morning. When several apples drop in response to limb bumping, its time to harvest within two days or apply NAA.

When NAA is used to control drop on ethephon treated trees, the two may be tank-mixed if the fruit is to be harvested within seven days. If the fruit is to be left on the tree longer than seven days after the ethephon, then NAA should be applied three days after the ethephon.

Rates of 10–20 ppm NAA are usually needed to be an effective stop-drop. To obtain the maximum drop control, use a split application of 10 ppm in the first spray, followed by a second spray of 10 ppm five days after the first. Split applications can provide drop control for about 12 days from the date of the first application.

As with thinning sprays, stop-drop sprays of NAA work best when applied with good coverage and plenty of water. Concentrating beyond 4X (less than 75 gallons of water per acre for 300 gallon TRV trees) may diminish the effectiveness. Use a non-ionic or organosilicone surfactant to enhance uptake.

When used as a stop-drop, NAA may advance ripening, especially at the maximum label rate of 20 ppm. The primary impact of this advance in maturity is reduced storage potential of the fruit, particularly in the loss of firmness. This effect is not consistent from year to year or block to block. The question then arises whether NAA-treated fruit has potential for CA storage or treatment with SmartFresh (1-MCP).

(Technical Editor’s Note: this loss of firmness is not an issue on PYO blocks or fruit held for short term storage.)

Perhaps the simplest way to answer the question with regard to CA is to remember the adage “garbage in, garbage out.” If the fruit was left on the tree to the bitter end of the drop control, is measurably softer than previously harvested fruit, and has elevated starch index values, then it should be marketed in the short term. On the other hand, if the fruit was harvested within a week after treatment and has good firmness and starch values for CA storage for the variety (e.g., McIntosh with 14 lb pressure and a Cornell chart starch index rating of 6 or lower), there is little reason to expect it to perform differently than similar fruit that received no NAA.

The question of whether NAA stop-drop sprays have advanced fruit maturity may be most critical when using SmartFresh on McIntosh, where the maturity of the fruit is an overwhelming influence on whether the fruit will respond to 1-MCP. Quoting Dr. Chris Watkins in the Proceedings of the 2003 Apple Storage Workshop: “We do not

have any data yet, but we assume that induced ethylene production that results from use of NAA will deleteriously affect fruit responses to 1-MCP. If you use stickers [NAA stop-drop], your storage operator should be informed.”

Finally, a comment about use of NAA on trees previously treated with ReTain. The use of both stopdrops at the respective correct times results in drop control that is superior to that obtained by using either one alone. Fruit treated in this manner, then left for an extended time on the tree, often have limited storage potential (see above); however, this combination can be an effective way of getting the ultimate in drop control. This drop control comes at a high price and should therefore only be used on high value fruit with little or no storage period, such as for a few rows of trees held for late picking in PYO blocks.

Apple maturity report (cont.)

Results of apple maturity testing, 5, 6-Sept, UMass Cold Spring Orchard, Belchertown, MA

Date	Location	Cultivar	Drop	Size (in.)	Color (% red)	Firmness (lbs.)	Soluble Solids	Starch Index*	Taste	Comments
9/5	Belchertown	Buckeye Gala	None	2.9	100	17.5	15	4.5	Good	Ready for 1 st pick; very red, looks like a Delicious
9/5	Belchertown	Lindamac	Few	3.0	90	15.4	12.5	3.5	Tart, mac-like	Pick in a week; watch drop
9/5	Belchertown	Honeycrisp	Significant	3.1	60	16.4	12.5	6.5	Good, typical of the cultivar	Ready to go this week; good flavor; troublesome drop
9/6	Belchertown	Honeycrisp	Few	3.3	60	14.5	13	6.4	Good	1 st pick
9/5	Belchertown	Marshall McIntosh	Some	2.9	55	16.8	13	3.9	Tart, a little starchy still	No ReTain
9/5	Belchertown	Marshall McIntosh	Few	3.0	65	16.0	12	3.8	Tart, a little starchy	ReTain treated
9/5	Belchertown	GingerGold	Few	3.2	N/A	14	12	4.5	Good still	Should be picked by now

* using the Cornell 'generic' starch-iodine index chart

Note: the next (and last for 2005) Healthy Fruit will be published September 19, 2005.

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