



Newsletter

Extension

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Drought Conditions in Ohio as of Oct 9th

<u>Region</u>	<u>Category of Drought</u>
NW Ohio	Moderate
WCentral Ohio	Severe
SW Ohio	Severe
SCentral Ohio	Severe
Central Ohio	Severe
NCentral Ohio	Near Normal
NE Ohio	Near Normal
Central Hills	Moderate
NE Hills	Moderate
SE Ohio	Moderate

Source: http://www.cpc.noaa.gov/products/analysis_monitoring/regional_monitoring/palmer.gif

Factors Influencing Apple Fruit Firmness

Source: DeEll, Saad, Khanizadeh, presented at the International Dwarf Fruit Tree Association annual conference, Hamilton, Ontario, Feb. 1999

Fruit firmness is one of the most important characteristics of apple quality. Unfortunately, it is also a characteristic that tends to be influenced greatly by many preharvest and postharvest factors. Obtaining

and maintaining apple fruit firmness from the orchard through to the consumer is one of the major issues facing apple producers. Apples with a firmness of less than 4.5 kg (9.9 lb) are usually rejected by consumers, and therefore, this is the minimum acceptable firmness level for many soft cultivars. This is a brief summary of factors that have been shown to affect apple fruit firmness.

Preharvest Factors

Most apple quality characteristics, including fruit firmness, are genetically controlled and thus vary with cultivar. For example, Granny Smith apples are firmer than most other cultivars, whereas McIntosh apples are among the softest. The strain within a particular cultivar can also influence fruit firmness, such as standard-type McIntosh strains (such as Redmax and Marshall) tend to be 0.45 kg (1 lb) firmer than the spur-type strains (Macspur) both at harvest and after storage. Rootstocks may have an effect on apple firmness, but this tends to vary with cultivar and/or strain.

There are conflicting reports as to the relationship between calcium content and apple fruit firmness. McIntosh fruit firmness at harvest has been found to increase slightly with increased flesh calcium concentration. However, the firmness of McIntosh apples does not appear to be influenced by preharvest sprays of calcium chloride or other commercially available calcium mixtures. Similarly, preharvest calcium chloride sprays do not affect the calcium content or fruit firmness of other cultivars, such as Welspur Delicious. On the other hand, Golden Delicious, Delicious, and Cox's Orange Pippin apples receiving calcium foliar applications have been shown to be .22 to .35 kg (0.5-0.8 lb) firmer than the respective non-treated apples. In some cases, preharvest calcium sprays seem to be only effective when applied very often (18 times during the growing season) or at very high rates that would damage apple skin.

Nitrogen application does not appear to influence apple fruit firmness. However, high-nitrogen fruit tend to be larger, softer, more prone to preharvest drop, and more likely to develop physiological disorders in storage. Fruit size may also be correlated negatively with firmness at harvest and after storage. Boron sprays do not appear to influence apple fruit firmness, while some phosphate compounds applied as foliar sprays can improve fruit firmness of certain cultivars.

Apple trees are sprayed with several sprays in order to control vegetative growth, hasten or delay ripening, delay apple abscission, and/or to simply enhance apple quality characteristics. Many of these compounds also affect fruit firmness. Fenclorpr results in firmer fruit for some apple cultivars but not for others; Alar generally results in greater fruit firmness but when other sprays are also used reduced firmness may result; NAA has little influence on apple fruit firmness; Cultar generally results in firmer apples; ReTain tends to cause firmer fruit at harvest but the effect is lost during storage.

Other cultural practices, such as crop density, root pruning, trunk scoring, and trunk ringing also affect apple fruit firmness. Apples appear to be slightly firmer when produced from trees with low crop density, compared to fruit from trees with high crop density. Fruit firmness may be greater when apple tree roots are pruned, depending on the time of pruning. Trunk scoring and ringing may affect apple fruit firmness, depending on cultivar. Water management also plays a role in determining fruit firmness. For example, fruits from non-irrigated apple trees may be firmer than those from irrigated trees, depending on cultivar and the type of irrigation.

Postharvest Factors

Maturity at harvest can have an effect on apple fruit firmness. Some apple cultivars (such as Golden Delicious and Redchief) show decreased fruit firmness with later harvest dates, whereas other cultivars

(like Starking Delicious) do not seem to be affected by harvest time. Maturity at harvest can also affect the rate at which apples soften during storage. For example, earlier harvested Cox's Orange Pippin apples have greater firmness retention during storage than later harvested apples. Although ethylene production of apples is associated with increased maturity, this is not necessarily a factor in fruit firmness.

Postharvest heat treatments (such 38 degrees C for 4 days) have been shown to improve firmness retention of some apple cultivars during storage. However, not all apple cultivars respond positively to prestorage heating. For example, holding McIntosh apples at 38 to 40 degrees C for 1 to 3 days results in firmness reduction. Dipping heat-treated apples in a calcium chloride solution tends to increase the effect of heating on firmness.

Postharvest calcium dips or infiltration (e.g. 4% calcium chloride) increases fruit calcium content and reduces firmness loss for many apple cultivars. However, calcium uptake may vary enormously with apple cultivar and rootstock as well as with different orchards and maturity at harvest for a given cultivar. The source of calcium also influences its effect on apple fruit firmness, and the addition of surfactants or thickeners to the calcium solution further improves firmness retention.

Other chemicals may also improve firmness retention in apples, even though that is not their primary use. For example, DPA is used to control storage scald, a physiological disorder of apple characterized by diffuse browning of the skin. However, DPA dips also tend to improve firmness retention. The use of a sucrose fatty acid polyester (SPE) coating, also known as Semperfresh, or DACP, an inhibitor of ethylene-binding, also reduces firmness loss in apples.

Temperature is the single most important factor governing the maintenance of postharvest quality. Therefore, rapid cooling after harvest greatly improves firmness retention in apples during storage. Low storage temperatures are equally important. McIntosh apples have been shown to soften as much as 20 times faster at 21 degrees C than at 0 degrees C.

Many apple cultivars held in controlled atmosphere (CA) storage have improved fruit firmness retention and longer storage life. Standard CA conditions generally consist of 2-3% oxygen and 2-4% carbon dioxide, although for some apple cultivars low oxygen (1-2% oxygen, 1-2% carbon dioxide) is also used, and in some places even ultra-low oxygen (0.7-0.9% oxygen, <1% carbon dioxide). CA storage, compared to ambient air, generally reduces fruit firmness loss by 1.4 to 2.0 kg (3-4 lb) after 4 months at 0 to 3 degrees; but this can be as high as 3.2 kg (7 lb) for certain cultivars. Rapid establishment (within 4 days) further reduces firmness loss, whereas ethylene removal from CA rooms results in very little or no improvement in fruit firmness retention.

GMO's and Market Changes

Yes, I know this is a FRUIT newsletter. However, the following article is indicative of the rapid changes taking place in agriculture because of Genetically Modified Organisms (GMO's). And besides, some of you also raise corn.

The American Seed Trade Association is providing a website <http://asta.farmprogress.com/> to help you locate grain handling facilities that have indicated a willingness to purchase, receive, and handle genetically enhanced corn that has not been approved for import into the European Union. Once into the site, you are prompted to indicate your zip code and the distance you would be willing to travel to

deliver your grain. A check for outlets within 60 miles of the Huron County Extension office yielded 21 hits.

Biotechnology Websites

We are being bombarded with an increasing amount of information about biotechnology. The "trickle down" effect of European Union concerns into the United States has started to raise questions with American consumers, particularly about the food we eat. In no particular order, here's a sampling:

"A Brief History of Biotechnology Risk Debates and Politics in the United States" <http://www.edmonds-institute.org/regal.html>

"Genetically Engineered Organisms Approved for Commercial Use in the United States, December 1998" <http://www.ucsusa.org/Gene/w98.market.html>

"How the Terminator Terminates" <http://www.edmonds-institute.org/crouch.html>

"University Role in Biotechnology: 1). How Do We Set Research Priorities?" <http://ianrwww.unl.edu/ianr/csas/newsletr/janfeb99.htm>

2). Who Benefits From New Technologies?" <http://ianrwww.unl.edu/ianr/csas/newsletr/marapr99.htm>

3). Who Owns Genes and Diversity?" <http://ianrwww.unl.edu/ianr/csas/newsletr/mayjun99.htm>

4). How Do We Sustain Food Production?" <http://ianrwww.unl.edu/ianr/csas/newsletr/julaug99.htm>

5). How Do We Assess the Risks and Benefits?" <http://ianrwww.unl.edu/ianr/csas/newsletr/sepoct99.htm>

Cider Season is Underway

Source: Peter Hirst, Facts for Fancy Fruit, Oct. 14, 1999, Purdue University

Many of you are now busy making cider. I urge you to play your part in helping to make this a cider season without the negative headlines and news stories that have affected us in the past few seasons. What can you do? You need to do a good job in all the aspects related to the production of cider - from "bloom to bottle" as I recently heard it described. A short-cut in any step along the chain will negate all your hard work in other areas. Cider is no place for rotten, wormy, or dropped apples. Before you are tempted to ease your standards a little, just think of the impact on your business, and the industry as a whole, of a child becoming sick from drinking your cider. None of us wants to see the TV news crews at our farm gate wanting to know what happened and ready to point the finger.

HACCP for Cider?

Source: Peter Hirst, *Facts for Fancy Fruit*, Purdue Univ.

I have heard unofficially that the FDA has backed off its HACCP rule for cider and is now gathering more data. This doesn't mean that a HACCP rule will not be imposed, but just that it is maybe not as imminent as we earlier thought. This should be good news for cider makers. I think it's obvious to all of us that if there are outbreaks of illness attributed to cider this season, then we are likely to see much more stringent regulations next season. If you like the idea of governing yourself rather than having the government do it for you, well here's your chance.

Terminal Market Wholesale Fruit Prices October 14, 1999

Chicago: http://www.ams.usda.gov/mnreports/HX_FV010.txt		
Apples - market about steady	Pears	Peaches
<u>Cartons 12 3-lb filmbags - Michigan</u> US Fancy Red Delicious 2 1/2" min 8.00 - 10.00, few higher & lower Golden Delicious 2 1/2" min 8.00 - 10.00, fair appearance 7.00 Jonathan 2 1/2" min 8.00 - 10.00, few higher and lower McIntosh 2 1/2" min 10.50-11.00, some 8.00 - 9.00 Gala 2 1/2" min fair appearance 7.00 Wisconsin Combination U.S. ExFancy-U.S. Fancy McIntosh 2 1/2" min 10.00-10.50 <u>Bushel cartons loose - Michigan</u> No Grade Marks No Size Marks-Red Delicious 9.00 -10.00, some 8.50 No Size Marks-Golden Delicious 9.00 - 10.00, some 8.50 No Size Marks-Jonathan 9.00 - 10.00, some 8.50 No Size Marks-McIntosh 10.00, few higher and lower	California and Washington only	<u>25 lb Cartons</u> New Jersey Various yellow flesh varieties 2 1/2' min fair quality 8.00 2 1/4" min fair quality 7.00 New Jersey U.S. ExOne various yellow flesh varieties 2 1/2" min 13.00

No Size Marks-Gala 9.00 - 10.00, some 8.50		
No Size Marks-Jonagold 9.00 - 10.00, some 8.50		
Detroit: http://www.ams.usda.gov/mnreports/DU_FV010.tx		
Apples - market steady	Pears	Peaches
<p><u>Cartons cellpack</u> - New York U.S. ExFancy McIntosh 100s few 20.00</p> <p>Empire 100s few 20.00</p> <p><u>Cartons 12 3-lb filmbags</u> - Michigan US ExFancy Red Delicious 2 1/2" min 10.50 - 12.00, mostly 11.00</p> <p>US Fcy Red Delicious 2 1/2" min 9.00 - 10.00, mostly 10.00, few higher</p> <p>Golden Delicious 2 1/2" min 10.00 - 12.00, mostly 10.00 - 11.00</p> <p>McIntosh 2 1/2" min 10.00 - 12.00, mostly 10.00 - 11.00</p> <p>Empire 2 1/2" min 10.00, few 12.00</p> <p>Gala 2 1/2" min 13.00</p> <p><u>Bushel Cartons Loose</u> - Michigan No Grade Marks</p> <p>Red Delicious 2 3/4" up 12.00, few 10.00</p> <p>Red Delicious 2 1/2" up 10.00 - 12.00, mostly 10.00 - 11.00</p> <p>Red Delicious 3" min 12.00</p> <p>Golden Delicious 2 3/4" up 12.00, few 10.00</p> <p>Golden Delicious 2 1/2" up 12.00, few lower</p> <p>McIntosh 2 3/4" up 11.00 - 12.00</p> <p>McIntosh 2 1/2" up 10.00</p> <p>Empire 2 1/2" up 10.50-12.00, mostly 10.50 - 11.00</p>	<p>California and Washington only</p>	<p><u>1/2 Bushel Cartons</u> New Jersey US ExOne various yellow flesh varieties</p> <p>2 3/4" up 12.00 - 14.00</p> <p>2 1/2" up 12.00</p>

Empire 2 3/4" up 12.00		
Pittsburgh: http://www.ams.usda.gov/mnreports/PS_FV010.txt		
Apples - market about steady	Pears	Peaches
<u>Cartons 12 3-lb filmbags</u> New York US ExFancy Golden Delicious 2 1/2" min 10.50-11.00 Jonathan 2 1/2" min 10.50 - 11.00 McIntosh 2 1/2" min 10.50-11.00 Gala 2 1/2" min 12.50-13.00 Jonamac 2 1/2" min 10.50-11.00 Pennsylvania US ExFancy Golden Delicious 2 3/4" up 12-13.00 Gala 2 3/4" up 12-13.00	<u>10 2-lb filmbags</u> NY Seckel 9.50	<u>25 lb cartons</u> No Grade Marks various yellow flesh varieties - West Virginia 2 3/4" min 9.50 2 1/2" min 8.50

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