Illinois Fruit and Vegetable News
Vol. 15, No. 13, October 5, 2009
A newsletter for commercial growers of fruit and vegetable crops

"We are what we repeatedly do. Excellence, then, is not an act, but a habit." Aristotle

Address any questions or comments regarding this newsletter to the individual authors listed after each article or to its editor, Rick Weinzierl, 217-244-2126, weinzier@illinois.edu. The Illinois Fruit and Vegetable News is available on the web at: http://www.ipm.illinois.edu/ifvn/index.html. To receive email notification of new postings of this newsletter, call or write Rick Weinzierl at the number or email address above.

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University of Illinois Extension Specialists in Fruit & Vegetable Production & Pest Management

Upcoming Programs

Numerous educational programs for fruit and vegetable growers are slated for the 2009-2010 winter season. A partial list is presented below, and more details will be provided as the dates approach. Be sure to mark your calendar for the 2010 Illinois Specialty Crops, Organic, and Agritourism Conference January 6-9, 2010, at the Crowne Plaza in Springfield, IL.

• Illinois Nut Growers Association Fall Meeting. October 18, starting at 10:00 a.m. at the Madison County Farm Bureau Building, 900 Hillsboro Avenue, Edwardsville, IL. Pot luck lunch, bring a dish to share and your own place setting and drink. For details contact Elizabeth Wahle at wahl@uiuc.edu or 618-692-9434.

• Good Agricultural Practices and Good Handling Practices Workshop, 8:30 a.m. – 4:00 p.m., November 5, 2009. Iroquois Room, Kankakee Community College, 100 College Drive, Kankakee, IL. Topics will include an overview of GAP’s and GHP’s produce safety impacts, good handling practices (post-harvest), vegetable retailer food safety concerns, auditing farms for food safety, educational and implementation resources, crisis and risk management. Cost per participant, including lunch, is $30 and $25 for an additional farm/family member (sharing the curriculum). Pre-registration is required by October 20, 2009. You may register online for this program. With this registration opportunity, you may use a credit card and immediately pay and confirm your registration. Online, you may also choose to pay by check which will tentatively register you until your check is received in our office. Additionally, you may call the office to register by credit card or pay in person at University of Illinois Extension, Kankakee County, 1650 Commerce Drive, Bourbonnais, IL 60914. The registration form is on our website: http://kankakee.extension.uiuc.edu. For more information, please call 815/933-8337.


• Iowa-Illinois Fruit & Vegetable Growers Symposium. December 11, 2009. Iowa State University Scott County Extension Office, Bettendorf, IA. (More details in future issues of this newsletter.)

• Illiana Vegetable Growers’ School. January 5, 2010. Teibel’s Family Restaurant, Schererville, IN. (More details in future issues of this newsletter.)

• Horseradish Growers School. January 28, 2010. Gateway Convention Center, Collinsville, IL. (More details in future issues of this newsletter.)


• Southwestern Illinois Commercial Tree Fruit School. February 3, 2010. First Presbyterian Church, Hardin, IL. (More details in future issues of this newsletter.)


• Illinois/Wisconsin (Stateline) Fruit and Vegetable Conference. February 15, 2010. Harvard, IL. (More details in future issues of this newsletter.)

• Kankakee Vegetable Growers School, February 24, 2010. Kankakee County Extension Office, Bourbonnais, IL. (More details in future issues of this newsletter.)

• Illinois Grape Growers and Vintners Association Annual Conference, 2010. Springfield, IL. (More details in future issues of this newsletter.)

• Organic Farming Conference, February 25-27, 2010. La Crosse, WI. (More details in future issues of this newsletter.)

• Illinois Small Fruit and Strawberry Schools. March 2-3, 2010. Mt Vernon Holiday Inn, Mt Vernon, IL. (More details in future issues of this newsletter.)


Regional Updates

In southern and southwestern IL … Signs of fall are everywhere in the southern region except for the dazzling leaf colors so far. Bucks have begun racking trees to remove velvet in preparation for the rutting season, walnuts have dropped, leaves are starting to flutter down, many farm markets without a fruit emphasis have closed or are in their last few weeks, combines are visible everywhere with the start of corn harvest, pumpkin sales are in full force, colds and flu abound, lawn mower use has slowed, its dark coming and going to work, overnight temperatures require a jacket, and mums and asters are in full bloom.

Apple harvest is complete for many growers in the southern-most counties but still has 1-2 weeks as you move to the northern reaches of the region. Growers in Calhoun County are just moving into Fuji, Firm Gold and Braeburn and have at least a week to go before Granny Smith is ready for harvest. Skin color development is outstanding following the below normal day and night temperatures throughout the ripening season. Conditions for summer rots have been very conducive and control has been variable throughout the region depending on the grower’s ability to keep an effective protective residue on throughout consistent rainfall. Although color and flavor has been excellent, crop load and size reports are variable depending on location and cultivar. Within the region, southern counties overall had a reduced crop relative to the northern portions of the state, most likely a result of poor pollination and early season injury during bloom.

Grape harvest is also coming to a close, with all but Norton already complete for most of the region. In talking to Brad Taylor of Southern Illinois University at Carbondale, he commented on the unusual occurrence of certain grape cultivars this year having an undesirable low pH while approaching near normal brix and total acids; he specifically experienced it with Traminette. We are interested in hearing from growers about which of their cultivars had this problem, so in additional to sharing this information with us, it would be a good idea for growers to always record numbers through the ripening process. Also this is a good time to identify stressed plants and flag them for future observation. A stressed plant will usually display early season fall color that is bright red. We usually think of leaf roll virus when we see bright red leaves, but the stress may also result from compacted soils, poor fertility, trunk injury, or any number of stress inducing factors. The main point is that once leaves drop, it is more difficult to identify a stressed vine.

The scent of frost is in the air, and grape growers are reminded to remove grow tubes if they have not already, in order to allow the vines to sufficiently harden off prior to a hard freeze. Do not attempt to remove leaves with a caustic material, i.e. lime-sulfur, thinking to force the plant in dormancy. Grape vines achieve maximum dormancy/winter
hardiness if leaves are allowed to senesce naturally on the cane. I might add that the likelihood of winter injury increases if downy mildew was not sufficiently controlled in September and resulted in early leaf drop.

Upcoming meetings: Be sure to check the list at the beginning of this issue for upcoming educational programs, including the Illinois Nut Grower Association Fall Meeting on October 18 in Edwardsville.

Elizabeth Wahle (618-692-9434; wahle@illinois.edu)

At Dixon Springs, strawberry plasticulture plantings have been completed, and plants are off and running. Many growers set plants a little earlier this year in an attempt to get a bit more growth this fall than we experienced last year. The planting at DSAC looks good at this time. Growers should monitor plantings for insect and disease problems and treat as warranted.

Plasticulture strawberries (and the employees who planted them) at Dixon Springs.

Harvest of primocane blackberries continues. We are putting additional mulch on our blueberries, and it is the time of the year when growers should be monitoring all fruit plantings for vole problems.

The tomato season was late but fairly good for many southern Illinois growers. The 10 inches and more of rain resulted in the demise of many (most) home gardens, and local demand for tomatoes remained strong all year. The process of cutting string, pulling stakes and removing plastic from tomato and pepper plantings continues. Funny how many pickup truck loads of plastic can be made from just a few rolls of mulch and trickle tape.

Jeff Kindhart (618-695-2444; jkindhar@illinois.edu)

Fruit Production and Pest Management

Don’t store apples for very long this season.

Iodine tests of most apple varieties grown at our test plots in Champaign showed very little accumulation of starch at harvest. It appears that most of the starch that had accumulated in late summer was quickly converted to sugars. Cloudy and wet weather had prevented adequate photosynthesis, which may have reduced the rate of starch accumulation. Apples intended for storage up to 2 months need a rating of 3.5 to 4 (on a scale of 1 to 5 where the greatest level of starch is 1; see the figure below). Longer storage time, up to a year, will need an iodine score of about 2 to 2.5. The reason is that starch is needed as a storage molecule for sugars. Sugars are what keep the fruits alive in storage. Fruits that have only sugars with no starch will quickly burn that sugar during respiration (yes, fruits do respire
in cold storage, albeit at slower rate). These fruits will not last in storage for much longer. However, fruits that have accumulated sufficient starch reserve should be harvested when some of that starch has started to breakdown. The reason is that you want to make sure that the fruits have reached their optimum maturity before they are harvested. These fruits will last in storage for more than a year given that the storage temperature and the amount of accumulated starch are adequate.

Starch index for “Red Delicious”. Fruits harvested with a starch index of 1.0 -1.5 will not keep in storage for very long. Similarly, fruits harvested with starch index of 4.5 to 5 will not keep much longer either. Fruits to be stored for up to a year should be harvested with a starch index of about 2 to 2.5. Fruit to be stored for only two months should be harvested with at 3.5 to 4.0. (Mosbah Kushad and A. Elgargoti)

Fruits of some varieties such as “Gala” and “Honeyscrisp” tend to have different levels of starch. For this reason, these varieties should either be spot picked or you may use the average starch index of about 25 fruits from each block in order to determine the optimum harvest and storage times. The photos below show different levels of starch in fruits from the two varieties. The darker the fruit color the more starch it has.
Starch levels of "Honeycrisp" fruits harvested on the same date.

Because of the low starch accumulation in most apple varieties grown throughout the state, my recommendation is not to store the fruits for more than three months, unless you have done the starch test and found that your fruits have adequate amounts of starch.

Mosbah Kushad (217-244-5691; kushad@illinois.edu)

Vegetable Production and Pest Management

Pumpkin and other Cucurbit Crops … Handling and Storage

Cucurbit crops vary widely in their harvest time and storage requirements depending on cultivar and location. For example, Jack-o-lantern harvest in Illinois usually starts in mid September to October, while cantaloupe harvest starts as early as mid July and continues as late as the end of September. Cucurbit crops also vary in their storage requirements. Some, such as summer squash and zucchini, are extremely sensitive to low temperature storage, while others, such as pickling cucumber, are more forgiving. Here are some of the important practices that you can follow to keep pumpkins and other cucurbit crops from being damaged postharvest. Some still apply as the 2009 season comes to a close; others serve as reminders for 2010.
**When to harvest.** Fruits harvested at the correct stage of maturity will keep longer in storage and have better quality. Harvest pumpkins when they reach maturity or full color. For those that have pick-your-own operations, cut the vine off of mature fruits to cure fruit, stiffen the handle, reduce disease infection, and slow down shrinkage. Pumpkins will continue to develop color after harvest, but pay attention to maturity. Fully green fruits will develop some color but those fruits will not store as well as fruits that are harvested mature. Cucumbers are harvested immature in order to keep that crisp and juicy texture and to keep the seed coat from hardening. Squash and summer squash grow very quickly and those fruits will not store as well as fruits that are harvested mature. Cucumbers are harvested immature in order to keep that crisp and juicy texture and to keep the seed coat from hardening. 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**Storage.** Selecting the appropriate storage temperature not only maintains quality but also keeps the fruit in good shape for the longest time possible. Most cucurbit crops can be stored together under similar conditions although a more refined storage temperature and humidity will lengthen the storage period. Also, the shelf-life of different cucurbits will vary depending on the cultivars. The following table lists ideal temperatures for storing different cucurbits.

Ideal storage temperatures and percent humidity for several cucurbit species.

<table>
<thead>
<tr>
<th>Cucurbit Species</th>
<th>Ideal Storage Conditions</th>
<th>Approximate Shelf-Life</th>
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</thead>
<tbody>
<tr>
<td>Cucumber pickling</td>
<td>Temperature (F)</td>
<td>Relative Humidity</td>
</tr>
<tr>
<td>Slicing cucumber</td>
<td>50 - 55</td>
<td>85 - 90</td>
</tr>
<tr>
<td>Summer squash</td>
<td>50 - 55</td>
<td>95+</td>
</tr>
<tr>
<td>Winter Squash</td>
<td>45 - 50</td>
<td>50 - 70</td>
</tr>
<tr>
<td>Pumpkin</td>
<td>55 – 60</td>
<td>50 - 70</td>
</tr>
<tr>
<td>Watermelon</td>
<td>50 - 60</td>
<td>90 - 95</td>
</tr>
<tr>
<td>Netted muskmelon*</td>
<td>40 – 45</td>
<td>95+</td>
</tr>
<tr>
<td>cantaloupe</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non netted melons- Casaba, Crenshaw, honeydew, etc.,</td>
<td>45 – 50</td>
<td>85 - 90</td>
</tr>
</tbody>
</table>

Adopted from Kader, 2002, with modification. *Storage of netted muskmelons in the commercial trade ranges from 37 to 41°F, however, chilling injury is a serious problem when the fruits are kept at these temperatures for more than a few days. Casaba keeps longer at 50 °F.

The above storage temperatures are ideal and so any changes from the above temperatures will reduce the shelf-life as well as the quality of the fruit due to either chilling injury or rapid softening.

**Chilling injury.** Chilling injury is an injury to the skin and outer flesh of mostly fruits of tropical origin when they are exposed to sub-optimal temperatures. Chilling injury can also occur in subtropical and temperate fruits such as apples and pears. Injury is characterized by indentations or pitting on the skin of the fruit. In severe cases the fruit surface will turn brown or soggy. Chilling injury is irreversible but it can be reduced or prevented by storing the fruit at optimal temperatures and in some cases conditioning the fruits at 70 °F for a few hours before they are placed in storage can reduce the symptoms. Chilling injury is different from freezing injury, although the symptoms are somewhat similar. Storing fruits under the optimal temperatures listed Table 1 does not cause chilling injury.

**Tips for storing pumpkins.**

- Harvest fruits at optimum maturity using either date from transplanting or when the rind color reaches full orange color but the color is dull.
- Avoid bruising fruits when picked. Train pickers to treat pumpkins as living tissue, which they are, not dead material.
- Harvest during the coolest time of day and avoid harvesting immediately after a rain storm.
- Harvest fruit with firm handles. Fruits without handles do not store as well.
- Move fruits out of the sun or cover them with cloth but not with plastic.
- Use the right size bins. Too many fruits on top of each other will cause bruising, which can damage the fruit a few days after harvest.
- Cure pumpkins and several other types of squashes before storage, but do not cure acorn squash.
- Store fruits in the coolest place possible if you do not have a refrigerator. If you have a refrigerator then store at the correct temperature.
- Avoid storing pumpkins with crops that require lower temperature storage such as apples, carrots, and pickling cucumber.
- Do not place hot fruits from the field on concrete surfaces so they do not sweat and do not store wet fruits on concrete.
- Wash fruits before storage and preferably add about 100 ppm chlorine to the wash water.
- Inspect fruits regularly and remove rotted ones.
• Do not harvest diseased fruits or damaged fruits.
• If fruits are harvested green then they should be stored at 60° F and not at 50 °F. Low temperature will cause some chilling injury and reduce color development. Green fruits can be turned into orange color by spraying them with a 200 ppm ethrel or ethephon. However, ethrel sprayed fruits do not store very well.

Mosbah M. Kushad and A. Elgargoti (217-244-5691; kushad@illinois.edu)

Less seriously …

A leading international agency surveyed several nations about key issues in hunger, food supplies, and food security. The final question was …

"Would you please give your honest opinion about solutions to the food shortage in the rest of the world?"

This question failed miserably to elicit useful responses because:

In Eastern Europe they didn't know what "honest" meant.
In Western Europe they didn't know what "shortage" meant.
In Africa they didn't know what "food" meant.
In China they didn't know what "opinion" meant.
In the Middle East they didn't know what "solution" meant.
In South America they didn't know what "please" meant.
In the US they didn't know what "the rest of the world" meant.
In Australia they hung up because they couldn't understand an Indian accent.
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<tr>
<th>University of Illinois Extension Specialists in Fruit Production and Pest Management</th>
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