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Apple Storage Problems

Keep an eye out for potential disorders and other problems if you have apples in long term storage. It's not a given that there will be problems every year. We are not able to predict when they will occur or be severe.

1. **Chilling injury** in Empire and McIntosh, particularly in apples treated with SmartFresh.

   Symptoms are not noticed until fruit are cut open to expose internal browning. One potential indicator that chilling injury has occurred is a sudden rise in the carbon dioxide concentration in CA storages as a result of greater fruit respiration. The chance for chilling injury increases with longer storage duration and colder temperatures. With the shortage of apple this year, it may never develop.

   There is also a risk with fruit picked at a more advanced stage of ripeness. Many of us delayed harvest this year because of the heat, so please, be careful about how long apples stay in storage. To reduce the risk of fruit loss, keep storage temperature above 34 °F, and carbon dioxide concentration in CA below 2%.

2. **Soft scald**, a chilling disorder in Honeycrisp, has shown up in apples at Highmoor Farm in fruit picked late regardless of storage temperature. Fruit picked earlier is not showing soft scald, but bitter pit in large Honeycrisp apples is evident.

3. **Excessive softening**. If you had to delay harvest to get better color, apples may have been too ripe for long term storage.

Upcoming Events

1) **Maine State Pomological Society meeting**
   **January 12, 2011. 9am - 12pm**
   At the Maine Agricultural Trade Show, Augusta Civic Center, Androscoggin room.
Agenda

9–10am, Business Meeting
Committee reports.
Market Promotion.
Other Business.
NRCS Programs.

10-11am, Henry Jennings, Maine Board of Pesticides Control.
Current and potential legislation that affects apple growers.
Computer tool for locating neighbors within contact zone.
Update on Clean Water Act.

11–11:30am, Renae Moran, UMaine Extension.
Weed management and disease incidence in an organically managed apple orchard, Honeycrisp storage studies, Zinc nutrition in new apple plantings, Plum variety trial.
11:30am–12pm, Glen Koehler, UMaine Extension.
Scab fungicide resistance in Maine orchards, Brown marmorated stinkbug.

Two pesticide applicator recertification credits will be offered for attending the morning program.

The afternoon session of the Maine Vegetable and Small Fruit Growers Association Annual Meeting features talks of interest to apple growers:
1pm, David Handley, UMaine Extension.
Berry update, Variety outlook, Pest management news.
1:30pm, John Young, Apple Marketing Board.
Getting and keeping seasonal workers.
2pm, Eric Gallandt, UMaine Dept. Plant, Soil, & Environmental Sciences.
Weeds! Strategies for preventing outbreaks.
2:30–3:30pm – Protect your land, Protect your options and Survive the taxes.
John Piotti, Maine Farmland Trust; Chris Coffin, American Farmland Trust; and Stephanie Gilbert, Maine Dept. of Agriculture, Food and Rural Services.

Pesticide applicator credit will be offered for attending the afternoon program.

2) Other presentations at the Maine Agricultural Trade Show
For the full Trade Show schedule, see http://www.getrealmaine.com/_ccLib/image/calendarEvents/PDF-37.pdf
For the full list of presentations that provide pesticide applicator recertification credits, see http://www.maine.gov/tools/whatsnew/attach.php?id=64589&an=1

Presentations that may be of particular interest to orchardists:
Tuesday, January 11
* How Current USD-GAP Audits Address Market Requirements for Food Safety and Traceability, Lauchlin Titus, AgMatters, 3:30–4:00.
* New Directions in Biotechnology and Pesticide Research, Leonard Gianessi, Crop Protection Research Institute, 4:00–4:30pm.
* How Do Organic and Modern Farmers Come Together for the Common Good in Maine?, Grower's Panel, 4:30-5:00pm.

**Wednesday, January 12**
* Apple IPM Basics, Glen Koehler, UMaine Extension, 9-10am.
* Worker Protection Standard Pesticide Handler Training, Jim Dill UMaine Extension, and Gary Fish, Board of Pesticides Control (no credits, but required for any employee involved with pesticide application, including cleaning and repairing equipment used to apply pesticide), 9-10:30am.

**Thursday, January 13**
* Colony Collapse Disorder: An Update, Frank Drummond, UMaine Extension, 10:45-11:45am.

3) *Preseason Apple Grower Meeting, March 16, 2011* at Highmoor Farm, Monmouth, ME, 9am – 3pm.

Featured speaker: Jon Clements, Extension Educator at the UMass Cold Spring Orchard Research & Education Center will give two presentations on high density tree fruit plantings he has visited around the world and the latest techniques for high density plantings. Additional presentations by Renae Moran, Glen Koehler, and the Maine Board of Pesticides Control. This meeting should qualify for two or more pesticide recertification credits.

4) **The Maine Legislature Ag Committee** will meet at the Maine State House (230 State Street, Augusta) sometime this winter (probably February) to review and set new regulations for aerial & airblast pesticide application notification requirements based on experience with the temporary regulations put in place for 2010.

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**Other News**

1) **Congress Passes New Food Safety Bill:**

A new food safety bill brings more FDA focus on prevention of food borne illness, requires safety plans from producers, and calls for more frequent inspections. Producers and processors with less than $500,000 annual sales are exempt from most of the requirements, but would still have to comply with one of the following:

1. Demonstrate that they have identified potential hazards and are implementing preventive controls to address the hazards, or
2. Demonstrate compliance with state or local food safety laws. Any food sold by a facility that opts for this option would have to prominently and conspicuously provide the name and address of the facility that produced it on a food packaging label, or at the point of purchase.

2) **Food processor grants**

Thanks to a June 2010 Bond, the Finance Authority of Maine has a new grant program available for food processors. Eligible projects include the purchase, design, construction, expansion or improvement of food processing and packaging facilities, as well as equipment located in Maine and used in conjunction with food processing. The
deadline is January 7. Maximum award is $300,000. There is approximately $1,000,000 available. For more information, see http://www.famemaine.com/files/Pages/business/businesses/Maine_Food_Processing_Grant.aspx

3) Pesticide residues in perspective

The Environmental Working Group’s (EWG) “Dirty Dozen” is a list of fruits and vegetables with most frequently detected pesticide residue levels recorded in USDA testing of 49 frequently consumed types of produce (http://www.foodnews.org/executive.php). This list has received considerable attention because of its implied warning of health risk from consumption of those commodities that rank higher on the list. Peaches are second highest on the list, apples are the fourth highest.

However, the validity of the methodology and especially the interpretation of the rankings have been questioned. One concern was that by using an overly simplistic presence/absence approach without relation to measurable health effects, and by implying danger from eating fresh produce without scientific justification, the list was actually harming consumers by steering them away from fresh produce that is better for health than processed foods.

The Alliance for Food and Farming (AFF), a non-profit farm industry organization, commissioned a panel of recognized experts in toxicology, pharmacology, risk assessment and nutrition to review these claims. While sponsored by the AFF, the panel worked independently. Among the panel’s conclusions was that:

“...the list is misleading to consumers in that it is based only upon exposure data while remaining silent about available information on the assessment of the toxicity of pesticides presented in the diet, and, as such, does not provide a basis to assess risk.”

The expert panel report is available at http://www.safefruitsandveggies.com/. In addition to the excerpts shown below, it also includes an Appendix (page 17) that provides a concise 4-page summary of the process EPA uses to determine allowable pesticide residues on food. A less comprehensive report that reaches the same conclusion is available at http://www.safefruitsandveggies.com/_pdf/pesticides-in-perspective.pdf

Here are other excerpts from the expert panel review of the “Dirty Dozen” list:

* There are no studies that specifically link pesticide residues in the diet with health effects.

* There is a substantial literature on the health benefits of consuming fruits and vegetables. Numerous published studies show that the consumption of fruit and vegetable-rich diets is associated with a reduced risk for high blood pressure; reduced risk of heart disease, stroke, and probably some cancers; and a lower risk of ocular and digestive problems.

* The development of toxicity reference levels for pesticides representing a “reasonable certainty of no harm” includes the incorporation of uncertainty factors that serve to achieve this regulatory standard. Typically, assessments include at least a 10-fold uncertainty factor for extrapolating from animals to humans, and a 10-fold factor for intraspecies variability (ed., i.e. different susceptibility between individual people), unless empirical data are available to show a different factor better reflects the data at hand. Furthermore, EPA, when establishing tolerances
(the legal limits on foods) must include an additional 10-fold safety factor for infants, children or fetuses unless there is convincing evidence that a different factor is appropriate.

* The Pesticide Data Program (PDP) data indicate that pesticide residues measured on domestic and/or imported commodities rarely exceed EPA tolerances, and, generally, are one or more orders of magnitude below the legal limit. In 2007, residues exceeding the EPA tolerance were detected in only 0.4% of 11,683 samples (USDA, 2008). While it would be desirable to further limit the already small number of samples that have residues exceeding tolerances, it is important to note that the toxicity of a pesticide does not factor into establishing a tolerance, and the tolerance level represents an exposure that is often substantially less than levels shown to cause effects in animal testing.

* EPA has adopted a public health protective approach to ensure “a reasonable certainty of no harm” (the legal standard mandated in FQPA) from consuming pesticide residues on food. It incorporates the most sophisticated, data-rich set of risk assessment methods that EPA conducts. Contrary to OTA’s assertion, the process explicitly considers infants, children and pregnant women and has an added layer of protection for these subpopulations. While there will always be some uncertainty associated with evaluating the possibility of small health risks, the available scientific evidence shows that EPA’s process is appropriately and adequately health-protective.

* EWG states that there is a “growing consensus among scientists” “that small doses of pesticides and other chemicals can cause lasting damage to human health, especially during fetal development and early childhood.” If “small doses” is understood to mean the doses one receives from pesticide residues in food, this statement is not supported by the existing scientific evidence.

4) IPM Review

While the use of pesticide in apple production has not been found to cause any significant dietary risk, it is also true that using the least amount of the lowest toxicity pesticide that successfully achieves pest management objectives is safer for the applicator and the environment, and better for the financial health of the farm.

Winter is the perfect time to review your pest management activities of the previous season to see what worked well and where improvement is needed.

Some things to consider:

a) Did you have the information you needed to make treatment decisions? Did your monitoring give you the information you needed? Is responsibility and process for making pest management decisions well organized? Is communication of decisions clear? Is implementation of decisions efficient and effective? Would more planning reduce stress and ad hoc decision making?

b) Were there any breakdowns in pest suppression or pest management operations? Any unwelcomed surprises? If so, what can you do to prevent a repeat next year?

c) Are your pesticide application records complete? Do you have an accurate inventory of pesticides in storage? Do you have cost data?

d) Are there preventive cultural methods or other steps you can take to reduce pest pressure before and during the coming season (e.g. leaf shredding, urea application to reduced overwintered scab lesions; pruning to remove disease inoculum and open canopies to light and wind; pushing back wooded borders for better air drainage and decreased pest pressure; removal of unsprayed host trees near the orchard.)
e) Are there mechanical improvements possible (e.g. better pump or pressure gauge for sprayer, better calibration, add strainers, upgrade to air induction nozzles, use donut to manage fan air speed, wind vanes to direct spray pattern).

4) What will apple industry look like a decade from now?

5) Update on Honeybee Health
(Summarized from information provided by Tony Jadczak, State of Maine Apiarist and Bee Inspector)

The cause of colony collapse disorder (CCD) affecting honeybees has not been conclusively identified. Research has implicated a combination of parasitic Varroa mites, the viral complex associated with Varroa, Nosema (a microbial disease that affects honeybees), along with possible additional stressors such as weather and forage conditions.

A recently published paper (*Iridovirus and Microsporidian Linked to Honey Bee Colony Decline*) identified an invertebrate iridescent virus (IIV) associated with CCD colonies. Prevalence of IIV was significantly able to identify strong versus failing and collapsed colonies. In addition, bees in failing colonies contained not only IIV, but also Nosema. Co-occurrence of these microbes consistently marked symptoms of CCD. The pathogen pairing was not observed in samples from colonies with no history of CCD.

The article is online at http://www.plosone.org/article/info:doi/10.1371/journal.pone.0013181. Clinical trials of an antiviral inhibitor treatment for honeybee hives have been conducted in FL, PA and CA. More trials will be conducted in 2011.

6) Beekeepers petition government to revoke registration of pesticides containing clothianidin (e.g. Clutch)

**Closing Words**

"Science is not a collection of facts but a way of interrogating the world."
Sharon Begley

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