



NEWS AND INFORMATION

November 2016

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Director's Update



Produce Safety Alliance Trainings Launched

We are a little late in rolling out this edition of our Postharvest Technology Center's E-newsletter and, naturally, I carry a significant portion of the shared minor delay. The rigors of the final push lead up and the actual Workshop event, held Nov 1-3, caused us to back-burner the finishing touches on the newsletter. The PTC staff, Penny Stockdale, Pamela Devine, Jenn Still, also supported by undergraduate PTC associate Stephanie Tomuta, did an outstanding job of coordination and organization in partnership with Donna Pahl and Betsy Bihn of the Produce Safety Alliance (PSA) <http://producesafetyalliance.cornell.edu/>. From all personal comments, participants were very positive about their experience with this integrated, expanded and more interactive version of the FDA-recognized Produce Safety Alliance Grower Training and our Advanced Good Agricultural Practices sessions, the Produce Safety: A Science-based Framework Workshop. Joining me from UCD as instructors were Linda Harris, Michele Jay-Russell, and Erin DiCaprio. Jim Gorny (PMA), Jennifer McEntire (United Fresh), Michelle Danyluk (U of FLA), and Justin Kerr (Factor IV Solutions) each gave highly informative and insightful presentations. Dave Murray of Andrew & Williamson gave a "boots-on-the ground" overview of response, recovery, and roadmap to continuing improvements following his direct experience with an outbreak and recall of cucumbers.

The Postharvest Technology Center was pleased to offer three registration fee scholarships to the California Alliance with Family Farmers (CAFF; <http://www.caff.org/>) to attend this special PSA-centered training. One was extended to Kali Feiereisel, MPH- CAFF Food Safety Specialist and two were provided to small farm owners nominated by CAFF for this certification course. Their participation and perspectives were a great addition to the Q&A and Breakout Session exercises.





Looking forward, I will be participating as a 'trainer of trainers' with Betsy Bihn and PSA regional staff members on a number of related programs. Two upcoming Train-the-Trainer events are hosted by Western Growers Association and Hartnell College. The need for PSA trainers is acute and these and other programs in the region are being planned as well as the standard 1-day PSA Grower Trainings. The PTC will continue to participate and coordinate with these and other FSMA Alliance groups in 2017.

Continuing to Celebrate the 50 Year Anniversary of the Mann Lab



Top-icing Sweet Corn

I recently had a request for information on cooling of sweet corn in relation to a "top n' tail" value-added operation venture on a small farm. For a fun look at the past, the 1971 article from UC Davis Vegetable Crops Specialists and Mann Lab faculty on Quality Sweet Corn Production is [attached here](#). Authors Bill Sims, Oscar Lorenz, and the predecessor of my Extension position, Bob Kasmire, were very productive in getting practical crop production and postharvest Best Practices out in hardcopy circulars. There are images in this Circular 557 which don't look that radically different from current sweet corn handling today. Wire-bound wood shipping crates aren't still used for sweet corn, except in some special markets, and the estimated cost of production was \$2.40 per crate (estimates today are closer to \$10-12). Sugar-enhanced and Supersweet varieties have dramatically improved sweetness retention since then and ice-injection has replaced top-icing trucks but the fundamental postharvest principles all still apply.

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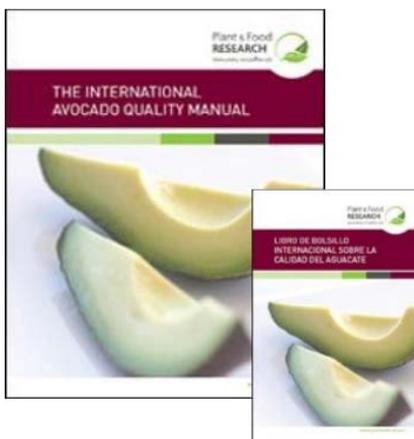
Registration Now Open!

Sprout Safety Alliance Sprout-Grower and Industry Training and Certification

Nov 29-Dec 1, 2016 Davis, CA. The Postharvest Technology Center (PTC) and Lead Instructor, Trevor Suslow, are offering the Sprout Safety Alliance Sprout-Grower and Industry Training and Certification course. This course will satisfy the FSMA requirement that at least one responsible individual for each operation (employee or consultant) receiving training within a recognized curriculum, and also enhance the sprout industry's understanding and implementation of best practices for improving sprout safety and understanding the specific requirements outlined in the FDA Standards for the growing, harvesting, packing, and holding of produce for human consumption specifically applicable to sprout operations.

To learn more about the course, including topics and modules, or to register, please see the [website](#). If you have questions about registration, contact our registration coordinator, Penny Stockdale at pastockdale@ucdavis.edu or 530-752-7672.

Featured Postharvest Bookstore Item



Sale! Receive 20% off Avocado Manual and Pocketbook in English and Spanish

Manual: This comprehensive avocado quality resource is printed on heavyweight gloss paper and comprises 70 pages (8.5" x 11") of information, including 85 photographs, with sections on assess quality, ripening, external quality, internal quality, cultivars, and damage scenarios.

Pocketbook: This handy pocketbook is intended to serve as a field companion to The International Avocado Quality Manual. The fully laminated booklet comprises 70 pages (3.6" x 6") of information, including 49 photographs, with sections on assessment of quality, ripening, external quality, internal quality, and damage scenarios.

Click [here](#) to go to the avocado page in our bookstore. Use sale code AVO20 to apply your discount. For a complete listing of all our publications see our [bookstore](#).

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Postharvest Specialists' Updates & Other News



Trevor Suslow Busy with FSMA Events

This was the month for more FSMA related activities including a week-long trip to FDA CFSAN in College Park, MD for a planning panel associated with the National Coordination Center. Trevor represented the Western Regional Training Center led by Oregon State University and our own Linda Harris as section-coordinator for our region. Facilitated by the International Food Protection Training Institute, the purpose of the panel was to begin to define a national core competency curriculum framework for expanded produce safety compliance and performance training targeting, primarily, small-medium scale growers.

Trevor served as Lead Instructor for a three-day Preventive Controls Qualified Individual certification training in Salinas, CA hosted and coordinated by Sonia Salas of Western Growers Association and Jim Gorny of PMA. Both served as co-instructors. Additional trainings will be held in Yuma, Arizona on January 4 - 6, 2017 and Brighton, Colorado on February 1 - 3, 2017.

Carlos Crisosto October Activities

Carlos spent a little time in Europe last month. He was an invited keynote speaker at the VI International Symposium on Persimmon (ISHS) in Valencia Spain. He presented The successful use of postharvest technology on reducing fruit losses and increasing fruit consumption.

Carlos went from Spain to the III Symposium on Horticulture in Europe (SHE 2016) in Chania Greece, where he presented Searching for a sulfur dioxide replacement for table grapes.



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Resource Spotlight



Rain Comes Back to California

The past two months has seen the usual extended periods of cool evening condensation but also some decent rainfall in many parts of California. Between the two, a spike in calls regarding postharvest decay of bell pepper and fresh market tomato has followed. This used to be a common, almost traditional, Fall season event with late crops but with many years of drought it hasn't come up as often. Much of the potential for control revolves around postharvest dump and flume management to minimize cross-contamination but more often infection is field and harvest initiated and even the best antimicrobial water treatments cannot prevent decay in transit.

Packing wet bell peppers is not advisable but is especially risky with these rainy conditions.

One option taken by shippers has always been a switch from 'wet-dump' to 'dry-dump' to avoid cross-contamination and internalization into the cap or stem-end under the calyx, often partially lifted from the fruit wall during harvest. This can reduce decay but, in these days of greater attention to food safety, it is important to pay attention to *Listeria* management when a packing line is modified or McGyvered (our new favorite description from a popular television show). A case example from the past is included on page 35 of the United Fresh Produce Association *Guidance on Environmental Monitoring and Control of Listeria for the Fresh Produce Industry* available on our website [here](#).

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On Our Website

Stay up-to-date with the Postharvest Technology Center by joining our [LinkedIn Group](#)



New Publications on our Website

Chukwan Techakanon, Thomas M. Gradziel, and Diane M. Barrett (2016). [Effects of Peach Cultivar on Enzymatic Browning Following Cell Damage from High-Pressure Processing](#). *J. Agric. Food Chem.* 2016, 64, 7606–7614.

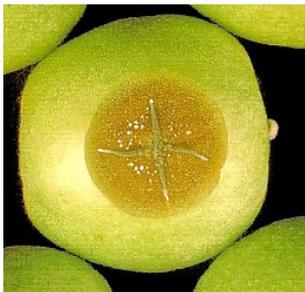
Haihem Bessi, Cyrine Ferchichi, Sondes Yousfi, Flamini Guido, Manel Issaoui, Veronique Bikoba, Elizabeth J. Mitcham, Kaouthar Grissa, and Sihem Bellagha, (2016). [Determining Effect of Ethyl Formate and Vapormate® on Disinfestation Efficiency and Organoleptic Quality of Date Fruits](#). *Tunisian Journal of Plant Protection Vol. 11, No. 1, 2016*

Postharvest Calendar

- November 29-December 1, 2016. Sprout Safety Alliance Sprout Grower Training Course. UC Davis Campus
- February 7, 2017. FRUTIC Symposium. Berlin Germany
- February 8-10, 2017. Fruit Logistica. Berlin, Germany
- April 18-19, 2017. Fruit Ripening & Ethylene Management. UC Davis Campus
- July 2-6, 2017. IX International Peach Symposium. București, Romania.
- July 18-20, 2017. IX Congreso Iberoamericano de Tecnología Postcosecha y Agroexportaciones. UC Davis campus

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Ask the Produce Docs



Q. Do you think ORP can be a useful tool for water disinfection monitoring in dump tanks and flotation tanks of apples and pears, where more than 100 ppm of available chlorine is used? The reason I'm asking you this is because, as you certainly know, an ORP curve is saturated and will reach a plateau at very low chlorine concentrations, and these low concentrations aren't enough to control *Penicillium* and other fruit pathogens.

A. Naturally you are correct in that one cannot be assured of meeting a specific ppm dose requirement when using oxidation-reduction potential (ORP) sensors. Another method of measurement, including dilution and titration or a high range chlorine-specific sensor in a flow cell would be a preferred choice. The measurement of ORP is nonspecific and reflects the combined effect of all dissolved redox active species in water. Typically, ORP readings plateau at 900 to 950 mV, when free available chlorine (FAC) concentration exceeds 20-25 ppm at pH of 7.0 or less. At high FAC levels the inline ORP sensor can become saturated and read a high millivolt (mV) value for a longer period of time than the ppm in solution are being maintained. The risk, of course, is running for extended periods with inadequate chlorination. ORP offset voltage readings obtained while measuring high concentrations of free available chlorine are not accurate readings. However, by maintaining desirable FAC concentrations (100 ppm) and low pH, this will provide enough evidence that the water is highly oxidative, even if the ORP readings do not change in response. Therefore, testing with a handheld ORP sensor that hasn't touched chlorinated water previously or after rinsing with distilled water is a best practice to cross check.

In regard to control of *Penicillium*, peer-reviewed journal papers point to the established evidence that lethality to conidia (spores) in water is optimized at lower hypochlorite (HOCl) ppm than often recommend in guidance, with appropriate pH management. A short list of useful papers is available [here](#). In particular, Salomă et al. (2008) provide good evidence that 50 ppm at pH 6.5 provides better lethality to *Penicillium expansum* than 100 or 200 ppm, used with less stringent pH management, and within a practical ORP sensor control for automated injection. Parameters for dump and flume management from these studies on postharvest decay of apples should allow you to make some informed choices which can be verified in your specific operation with simple tests that many microbiology labs could perform.

--Adrian Sbodio and Trevor Suslow

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End Notes and Disclaimers

Postharvest Questions. If you have a perplexing postharvest question you'd like answered, please send it to postharvest@ucdavis.edu, and we'll see if one of our specialists can help.

Archived Items. Link to a data store of all our previous "Ask the Produce Docs" questions, or link to [archived copies](#) of our monthly e-newsletter as PDF documents.

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