



March 2016

Quick Links

- [Director's Update](#)
- [Postharvest Education @ UC Davis](#)
- [Featured Postharvest Bookstore Items](#)
- [Book Review](#)
- [Postharvest Specialists' Updates](#)
- [What's New on Our Website](#)
- [Postharvest Calendar](#)
- [Ask the Produce Docs](#)

Director's Update



And the Postharvest Technology of Horticultural Crops Short Course Scholarship Goes to...

The review panel considered almost 80 applicants for this year's scholarship opportunity. We received applicants from over 35 countries competing for this scholarship. We congratulate Awanthi Mahanama from Sri Lanka who was selected by the review committee. I wish we could award many more scholarships, and hope that the other applicants can find another way to attend. We are excited to offer Awanthi this opportunity and hope that she will use the knowledge gained to improve postharvest practices throughout her country.

Fruit Ripening & Ethylene Management Workshop Wrap-Up

As you receive this March e-newsletter we have just finished a strong showing of attendees at the March 1-2, 2016 Fruit Ripening & Ethylene Management Workshop. Participants heard about topics as varied as ripening facilities and equipment, the biology of ethylene production, temperature management, fresh fruit market trends and new technologies and equipment. As with all our workshops, participants had the opportunity to talk to the instructors to learn in-depth about a topic that holds interest, as well as network with other participants. Thanks, everyone for another successful workshop!

--Beth Mitcham

[\[Back to Top\]](#)

Postharvest Education at UC Davis

June 2016 Postharvest Technology Short Course Starting to Fill

With enrollments heating up, we're starting to get excited about the 38th Annual Postharvest Technology of Horticultural Crops Short Course. The first week of the course will be held June 13-17 at the UC Davis Activities and Recreation Center, with the optional field tour throughout central California occurring June 20-24. The course is an intensive study of the biology and current technologies used for handling fruits, nuts, vegetables and ornamentals in California. It is designed for quality control personnel packers, shippers, transportation companies, service providers, food service, research and extension workers, and other professionals interested in the fundamentals of and current advances in the postharvest technology of horticultural crops.

Course topics will include: maturity indices, measuring quality, preparation for market, packinghouse facilities and equipment, packaging, containers, unitization, cooling, storage, managing ethylene, transport, sanitation and other procedures related to decay and insect control, food safety assurance, standardization and inspection, energy use, marketing, harvesting and postharvest handling systems for various commodity groups, and an overview of



current postharvest research at UC Davis.

For complete information or to register for this world-renown course, please visit the [webpage](#), or contact [Ms. Penny Stockdale](#).

Open for Enrollment: Fresh-cut Products Workshop

We are pleased to announce enrollments are now open for the September 13-15, 2016 [Fresh-cut Products: Maintaining Quality & Safety Workshop](#). Organized by Dr. Marita Cantwell, this 3-day workshop will be held at the Alumni Center on the UC Davis campus, and will provide an overview of many aspects of the production, processing, packaging, distribution and quality assurance of fresh-cut products.

Participants will gain a working knowledge of established and new procedures for the fresh-cut product category through topic-related sessions and demonstrations. The 2016 workshop will include a couple of new instructors on the program and will feature discussions on microbial food safety and the effects of temperature and modified atmospheres, and the sensory quality of fresh-cut fruit and vegetable products. We have held the registration fee at \$1150. Participants may [register on-line](#), or contact Registration Coordinator, [Ms. Penny Stockdale](#), for more information.



[\[Back to Top\]](#)

Featured Postharvest Bookstore Items



Receive 20% off this month's featured publication: *Tecnología Postcosecha de Cultivos Hortofrutícolas*

We are offering a special 20% discount on the Spanish CD version of "Postharvest Technology of Horticultural Crops." This is an invaluable resource for research professionals, quality control personnel, and postharvest biology students – anyone involved in technology for handling and storing fresh fruits, vegetables, and ornamentals; applicable worldwide. Contains 154 color photos, 184 black-and-white photos, and 111 graphs and illustrations. Click [here](#) to find the sale code.

For a complete listing of all our publications see our [bookstore](#).

[\[Back to Top\]](#)

Book Review

Title The Produce Contamination Problem. Causes and Solutions

Editors Karl R. Matthews, Gerald M. Sapers, Charles P. Gerba

Additional Information 2014. ISBN-13: 978-0-12-404611-5, 467pp.

Academic Press/Elsevier, San Diego CA USA; available in electronic or hard copy versions

Review This 2nd edition is a substantial update and expansion of the 2009 book. It should be of interest to both US and international professionals

interested in fresh produce food safety issues. The book is edited and written by 33 food safety experts. The opening statement by editor Matthews points to the authors' straight forward scientific approach: "The premise of the book is that once human pathogen contamination of fresh produce occurs, it is extremely difficult to reduce pathogen levels sufficiently with currently available technologies based on washing with sanitizing agents to assure microbiological safety". The book is organized into four main sections. The 8 chapters in section one discuss specific sources of contamination (manure, water, air and wildlife), and how the contamination occurs during production and handling of fresh produce. There are 6 chapters in the second section on particular product groups (leafy vegetables, melons, sprouts, tomatoes, tree nuts and berries), the food safety outbreaks associated with them, and the special characteristics of the products and production practices that contributed to the outbreaks. There are 2 chapters in a third section; one discusses produce contamination in Mexico and Central America, and the second presents the regulatory background and issues in Europe. The 3 chapters in the remaining section discuss technologies to reduce contamination of fresh produce. One chapter presents an overview of washing and sanitizing agents including the major currently used sanitizers but also approved alternatives, and washing equipment. One chapter discusses advanced technologies for detection of microorganisms and control technologies including cold plasma irradiation, pulsed light, high pressure processing, sonication and biological controls. A final wrap-up chapter also includes recommendations for further work. This book puts many current food safety issues into context and is a very authoritative, well referenced, well written and timely reference for those involved in food safety research and education.

Date Feb 2016

Short Review By Marita Cantwell

Postharvest Specialists' Updates & Other News



Angelos Deltsidis—Back to Bangladesh

Angelos traveled to Bangladesh between Jan 21st and Feb 11th where he was joined by Beth Mitcham for the first week. First stop was Bangladesh Agricultural University in Mymensingh where they built a chimney dryer with the help of local staff, students and carpenters. Angelos spent time working on an innovative floating garden design that Michael Reid and Rana Islam have developed. He also visited several locations where three low cost technologies--chimney dryer, CoolBot cool rooms and floating gardens-- will be implemented, and met with farmers and evaluated each location for suitability.

Next up, Angelos went to Jessore for 3 days to check on the construction of a CoolBot cool room before finally returning home. He shares this [link](#) for more information about the solar dryer construction.

Beth Mitcham visits Abu Dhabi

Beth Mitcham attended the Global Forum for Innovations in Agriculture on February 16-17 in Abu Dhabi where she presented "Barriers to Efficient Agro-Logistics". While in country she visited a sustainable city in Dubai that was designed in partnership with the University of California, Davis.



[\[Back to Top\]](#)

What's New on Our Website



Featured this Month on the Postharvest Technology Center Website: Most Useful Postharvest Websites

Did you know there is a section on our website with a compilation of the most helpful postharvest websites organized into the following topics?

- Comprehensive Postharvest Handling Resources
- Global Postharvest Handling
- Other University and Commodity Specific Postharvest Handling
- Quality Standards
- Pesticides, Additives, Organics, and Quarantine Requirements
- Nutrition

- Food Safety, Traceability, and Defense

There is!! And you can find it [here!](#)

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

New Publications on our Website

Diehl, D. C., N. L. Sloan, J. K. Brecht, and E.J. Mitcham. 2015. [What factors do retailers value when purchasing fruits? Perceptions of produce industry professionals](#). Journal of Food Distribution Research, 46(3): 81-91.

Nham, N.T., S.T. de Freitas, A.J. Machnish, K.M. Carr, T. Kietikul, A.J. Guilatco, C. Jiang, F. Zakharov, and E.J. Mitcham. 2015. [A Transcriptome Approach towards Understanding the Development of Ripening Capacity in 'Bartlett' Pears \(*Pyrus communis* L.\)](#). BMC Genomics, 16:762.

Ummarat, N., Arpaia, M.L., and Obenland, D. 2015. [Physiological, biochemical and sensory characterization of the response to waxing and storage of two mandarin varieties differing in postharvest ethanol accumulation](#) Postharvest Biology and Technology, 109 82-96.

Obenland, D, Cantwell, M., Lobo, R., Collin, S., Sievert, J., Arpaia, M.L. 2016. [Impact of storage conditions and variety on quality attributes and aroma volatiles of pitahaya \(*Hylocereus* spp.\)](#) Scientia Horticulturae 199 15–22.

[\[Back to Top\]](#)

Postharvest Calendar

- March 23-24, 2016. [Sixth Annual Chapman Phytosanitary Irradiation Forum](#), Chapman University, Orange, CA
- April 12-13, 2016. [37th Annual Citrus Postharvest Pest Control Meeting](#). Oxnard, CA
- June 13-24, 2016. [38th Postharvest Technology of Horticultural Crops Short Course](#). UC Davis campus
- July 18-20, 2016. IX Congreso Iberoamericano de Tecnología Postcosecha y Agroexportaciones. UC Davis campus
- September 13-15, 2016. [Fresh-cut Products: Maintaining Quality & Safety Workshop](#). UC Davis campus
- October 17-21, 2016. [III Symposium on Horticulture in Europe \(SHE 2016\)](#). Chania Greece

[\[Back to Top\]](#)

Job Openings

Washington State University – Food Safety Specialist with the rank of Assistant or Associate Professor. The School of Food Science (SFS), a joint program between Washington State University and the University of Idaho, is looking for a dynamic, motivated, highly skilled and experienced problem solving leader who addresses the needs of industry, stakeholders, and communities across the state and nationally, providing solutions through relevant and engaging research and outreach programs. This 12-month, full-time, tenure-track, Assistant/Associate Professor position will join our research and extension team and enhance the SFS's position in food safety with an emphasis on raw agricultural products and minimally processed foods produced in the Pacific Northwest. The position location is negotiable between Pullman, Wenatchee, and Prosser Washington.

Screening will begin on April 1, 2016, and will continue until position is filled. To apply: Application materials must include: detailed letter of application addressing all qualifications, a current curriculum vita, copies of transcripts, and the names and contact information for three professional references along with the application. Reference letters will be requested from the finalists. Visit www.wsujobs.com (Search #122570). For additional information on Washington State University, CAHNRS or SFS, visit <http://cahnrs.wsu.edu/> and <http://sfs.wsu.edu>. Please contact Dr. Carolyn Ross, Search Committee Chair, at cfross@wsu.edu, 509-335-2438 for questions about this position. EEO/AA/ADA.

Ask the Produce Docs

Q. An importer of vegetables recently asked what was causing a decay problem. A severe example is illustrated on the pepper stem shown in the photo. Other photos showed decay on the fruit surface and a blackish decay on some stem ends. This issue required expensive repacking of the peppers and considerable losses. How to minimize this problem?



A. At first glance this appears to be bacterial decay. Bacterial decay due to poor sanitation has been a common postharvest issue with peppers. However it is impossible to definitely diagnose this decay issue without culturing and identifying the organism. Indeed, from the images provided, there appears to be more than one disorder involved. There are fungal species as well as bacterial species that could result in this sloughing of the stem and slimy decay, but without extensive blackening. After several back and forth emails with the importer, the following was reported:

- The harvest clippers were cleaned frequently and workers sanitized their hands frequently; (however many of the peppers were not cleanly trimmed and had ragged and crushed ends that would be much more susceptible to decay than a clean cut).
- The spray wash water had 150 ppm chlorine (a high concentration) and peppers are forced air dried after washing; both pH (6.5-7.0) and chlorine concentration were frequently monitored.
- The peppers were handled at 45-50F and the photo above was taken after 13 days.

This all seemed a reasonable postharvest handling regime, but had anything changed in the operation? An important change this season was reuse of the chlorinated water, with two changes daily. In the past, only single use spray water was used. The importer insisted that the water quality was checked and could not be contributing to the decay issue. Since we have limited information on process controls and other water quality parameters and chlorine monitoring was periodic rather than continuous, it does open the possibility that sanitation of the reused water could be the source of the problem.

However, an internal and latent (dormant) fungal infection in combination with harvest damage, water uptake during washing (especially likely at ragged stem cuts), and time at the intermediate storage temperatures, could also result in this type of decay. Bacterial decay on peppers shows slimy but also darkened stems in the timeframe presented, which was not seen in this case. Therefore without culturing and identifying the decay-causing organism, the answer to this problem is not obvious.

See two previous related Q&A regarding decay on peppers [here](#).

--Marita Cantwell and Trevor Suslow

[\[Back to Top\]](#)

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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Editorial Review. Beth Mitcham



Writing. Pam Devine, Beth Mitcham, Marita Cantwell, Trevor Suslow



Layout & Design. Pam Devine



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