



## NEWS AND INFORMATION

**September 2016**

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### Director's Update



Change is good and generally refreshing and energizing. *Change for the sake of Change must be discouraged and rooted out...* I think I remember that from Harry Potter. The Postharvest Technology Center at Davis has a rich and impressive legacy and Beth Mitcham deserves high praise for both preserving the standards of excellence and expanding and guiding the Center into new ventures in outreach, education, and communication. The updated and improved website and recently launched Mobile-Ready accessibility announced last month are just a few of these positive changes.

As I step into some very large shoes, I will keep and plan to accelerate the pace of positive change and how we interact with our base and emerging clientele. One of my goals is to broaden the level of involvement among our basic and our applied and extension faculty and use the PTC platform to distill, translate, and disseminate emerging technology advancements to a broader industry audience. Carrying on from what Beth has started, our capacity to extend knowledge and our ability to be both innovative and responsive to internal and external stakeholders will require a greater level of change in how we function. With the shifting priorities of postharvest management in both a local and global economy, we need to drive internal change to keep pace.

While preserving the current organization and goals of the Postharvest Technology Center, my strategy moving forward will be to broaden our function as a hub for postharvest quality and produce safety expertise, applied technology systems, and instructional extension excellence across institutions, disciplines, and go further to bring diverse industry expertise into guiding our path forward. I especially look forward to the collective support of colleagues across the UC and CA State University system, serving and interacting with the postharvest community in the future.

#### **Kentaro Inoue**

It is with great sadness that we notify our Postharvest Community of the accidental death of Professor Kentaro Inoue, a member of the UCD Postharvest Biology Group and highly regarded instructor in the annual Postharvest Technology of Horticultural Crops Short Course. In course evaluations over the past several years, the numerous participants of the Short Course always commented on Kentaro as an engaging and enthusiastic instructor with a charming and humorous talent for drawing students into challenging topics in advanced technologies for fruit ripening biology research. He will be fondly remembered by colleagues, students, and Short Course graduates around the world. See [here](#) for a tribute and to leave a comment about Kentaro.

#### **Appropriate Month to Take the Lead**



As a produce safety specialist, I am pleased to begin leading the Postharvest Technology Center in September as it is the official National Food Safety Month. Granted, embracing the concept of building a Food Safety Culture across the supply and marketing chain makes food safety awareness and preparedness an everyday behavior and mindset. According to NFSM website, their goal is to heighten the awareness of food safety education for the restaurant and foodservice industry - that part of the chain closest to the end consumer. Created in 1994, they identify new themes annually and offer free training activities and posters on their website [foodsafetymonth.com](http://foodsafetymonth.com). Thanks to Christine Bruhn, Postharvest CE Emeritus, for bringing this to our attention.

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## Postharvest Education at UC Davis



### Full Class for Fresh-cut

September 13-15, 2016, UC Davis Campus. The class is on a waitlist status, but the enrolled participant status can change so notification of an open registration will be sent to waitlisted individuals in the order they were received. If you wish to check pending and current availability please contact our Registration Coordinator, [Ms. Penny Stockdale](#), at 530-752-7672 for more information.

The fresh-cut industry and this workshop have changed considerably over the past 20 years. The workshop is relevant to all levels of fresh-cut produce industry professionals—from small, local and regional produce processors to large businesses with nationwide distribution. Food scientists, food engineers, quality assurance personnel and new product development staff as well as representatives from research institutions, the restaurant and institutional food industries, and equipment, packaging and ingredient suppliers will all benefit from attending.

If you are unable to attend, you can purchase this annual workshop's instructional materials [here](#). The publication includes a binder, containing lecture notes, demonstration handouts and the first page of each referenced publication included on a separate flash drive; Fresh-cut Buyers Guide; Commercial Cooling of Fruits, Vegetables and Flowers; Refrigerated Trailer Transport of Perishable Products; and Air Transport of Perishable Products.

### Produce Safety Workshop Open for Registration

November 1-3, 2016. UC Davis Campus. Produce safety expert Trevor Suslow developed this interactive two-and-a-half-day workshop to provide an expanded version of the FDA-recognized Produce Safety Alliance curriculum for grower certification with training sessions built from a science-based framework to create Microbial Produce Safety Systems from Preharvest to Postharvest.

In addition to the required components, leading academic and industry instructors will provide an expanded and interactive approach to building an improved understanding of the current scientific basis for produce microbial safety systems and introduction to preventive controls, validation, verification and



environmental monitoring. Register [here](#), or visit the [website](#) for more information. If you need assistance, contact our Registration Coordinator, [Ms. Penny Stockdale](#), at 530-752-7672 for more information.

## Featured Postharvest Bookstore Item



### Sale! Receive 20% off our Fruit Ripening & Ethylene Management Publication

This [publication](#) is the course material, developed and updated for the Fruit Ripening & Ethylene Management Workshop which was held March 17-18, 2015. It includes optimum procedures for ripening a variety of produce, and provides 7 color ripeness charts and numerous color tables and photographs, as well as introducing the new color Produce Facts for 19 important commodities. The publication provides detailed instructions for measuring soluble solids in melons and other fruits, and a helpful resources directory.

Use sale code [FREM20](#) to apply your discount. For a complete listing of all our publications see our [bookstore](#).

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## Postharvest Specialists' Updates & Other News



### A busy Month for Trevor Suslow and Colleagues

Trevor was lead organizer, convener, and speaker at the International Association for Food Protection (IAFP) Symposium entitled *FSMA Preventive Controls for Produce Packing and Cooling Operations: A Reality Check and Near-term Aspirational Compliance Roadmap*. Trevor was joined by invited moderator and speakers from FDA, Michelle Danyluk (U of FLA), and Joe Stout (Commercial Food Sanitation.com). The goal was to inform those with limited experience but high expectations for **packing and cooling** facility design and operation in relation to the FSMA Preventive Controls Rule or industry-imposed interpretation of the PC rule compliance components on this sector as equivalent to **processing and manufacturing**.

Collectively we are working with diverse stakeholders to bring more packers/handlers of raw commodities into the modern concepts and practices as food handlers, but the economic resources and available equipment and facilities with proper Sanitary Design are slow to be adopted or even available. The economic barriers to FSMA PC compliance (if covered) or Secondary Activities Farm industry-enforced degrees-of-equivalency to PC among mid-size packers were identified and prioritization of incremental change needs support from on-site research and pilot system studies.

In addition, Trevor was an IAFP Round Table Panelist in the session convened by Sid Thakur and Eduardo Gutierrez of NC State University entitled *Real World Conversation On Food Safety And Microbial Quality On Sustainable Diversified Farming System*. The focus for the diverse group, including Jim Gorny (PMA), was to discuss and interactively engage the audience in the challenges/opportunities related to the agricultural practices within sustainable, organic, biodynamic and diversified farming systems in relation to FSMA, food safety and public health.

At this IAFP meeting a poster describing a collaborative project was presented by L. Walter entitled **Assessment of *Listeria* Risk and Sanitation Methods of Apple Packing Facilities**. Authors were L. Walter<sup>1</sup>, I. Hanrahan<sup>2</sup>, Y. Liao<sup>1</sup>, T. Suslow<sup>3</sup>, J. Pinzon<sup>3</sup>, and K. Killinger<sup>1</sup>

<sup>1</sup>Washington State University/University of Idaho School of Food Science; <sup>2</sup>Washington Tree Fruit Research Commission, Yakima, WA, <sup>3</sup>University of California Davis

Capping off August, Trevor served as the convener and lead instructor for another Commodity Specific Training for the CA Department of Public Health Food and Drug Branch and California Food Emergency Response Team (CalFERT) in a 2-day session on **Soil Systems and Management with Soil Amendments of Biological Origin**, focusing on the science foundation for risk assessment and current challenges in data gaps related to the FSMA Produce Rule. Among those joining Trevor as instructors and speakers were Michele Jay-Russell (Western Center for Food Safety), Irwin Ronaldo Donis-Gonzalez (UCD Department of Biological and Agricultural), and Bonnie Fernandez-Fenaroli (Executive Director; Center for Produce Safety). The sessions were also broadcast to several Rapid Response Teams in other states.

### **Linda Harris Assumes Presidency of the International Association for Food Protection**

The International Association for Food Protection (IAFP) includes educators, government officials, microbiologists, food industry executives and quality control professionals who are involved in all aspects of growing, storing, transporting, processing and preparing all types of foods. More than 4,000 food safety professionals, representing more than 70 countries, are involved in all aspects of growing, storing, transporting processing and preparing all types of food.

During the meeting Linda presented two poster presentations on pistachios:

Casulli, K., F. Garces, K. Dolan, L. J. Harris, and B. Marks. 2016. Modeling the effect of product temperature, moisture, and process humidity on thermal inactivation of *Salmonella* in pistachios, (Abstract P2-XX), Annual IAFP Meeting 2016, St. Louis, MO, July 31- August 3.

Moussavi, M., V. Lieberman, C. Theofel, and L.J. Harris. 2016. Growth of foodborne pathogens on inoculated pistachios during postharvest handling, (Abstract P2-XX), Annual IAFP Meeting 2016, St. Louis, MO, July 31- August 3.

At the conclusion of the IAFP 2016 in St. Louis Missouri, Linda, who has been a member since 1987, accepted her new position.

Linda also authored the following article:

Harris, L. J., V. Lieberman, R. P. Mashiana, E. Atwill, M. Yang, J. C. Chandler, B. Bisha, and T. Jones. 2016. Prevalence and amounts of *Salmonella* found on raw California inshell pistachios. *J. Food Prot.* 79(8): 1304-1315.

Please link to the abstract [here](#).

### **Beth Mitcham Elected Vice President of the American Society for Horticultural Sciences**

After giving two presentations, “International opportunities for research, education and extension in horticulture” and “Gaining international presence for promotion and tenure” at the American Society for Horticultural Sciences meetings in Atlanta, GA August 8-11, Beth Mitcham started her term as ASHS International Division Vice President at the close of the Annual Business Meeting, and will hold the position for 2 years.

Beth traveled to British Columbia, Canada August 15 – 18 to attend a memorial service for Norman Looney, past two-term President of the International Society for Horticultural Sciences, member of the International Advisory Board of the Horticulture Innovation Lab and a proponent of horticulture around the world. While in British Columbia, I also visited the Science and Technology Branch of Agriculture and Agri-Food Canada in Summerland.

### **Postharvest Technology Center Participating in Farm Tank Tour**

The 1<sup>st</sup> annual Farm Tank Summit will start in Sacramento on September 22, 2016 at the Hyatt Regency with interactive panels including researchers, farmers, chefs, policy makers, government officials and students. The second day will have participants traveling to sites around the area for custom-designed tracks that vary from farming operations to tech solutions. On that Friday, Trevor Suslow and Marita Cantwell will be available to interact with participants and answer technical or programmatic questions. The Postharvest Technology Center staff, Linda Harris, Specialist in Food Safety, and new UCD



Community Food Safety Specialist Erin Leigh Dicaprio will participate in the Hubs and Innovation Track Tour. For more information, click [here](#).



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## Grant Opportunities

### Dried Apricots Handling, Marketing

Sept. 12 is the deadline to apply for a \$300,000 grant from the Horticulture Innovation Lab focused on the needs of growers in Burkina Faso: <http://bit.ly/2b1dFVc>

### Tomato Postharvest Research

Sept. 12 is also the deadline for proposals from U.S. researchers focused on the needs of growers in Burkina Faso, for up to \$300,000 from the Horticulture Innovation Lab: <http://bit.ly/2aGF2lh>

## Resource Spotlight

### Adding Portable Pre-cooling to your Quality Management Programs

I. Ronaldo Donis-Gonzalez and T. Suslow

Grower/Shippers of multiple production scales are increasingly looking to improve the quality and 'marketing reach' of their perishable products to more distant destinations. Good temperature management is the most important factor in maximizing the postharvest life and quality of the majority of fresh and processed produce. Achieving optimal short-term storage and pre-shipping temperature in the shortest time possible will significantly increase the percentage of marketable produce. Forced-air pre-cooling (pressure cooling) is often the method of choice and has been accessible to large and small handlers for a long time. Generally speaking, commodities are cooled using forced-air by pulling air from a refrigerated room, through the vents into the produce containers. The air rapidly removes heat from the produce, as it is pulled through the vents and cools the commodities. However, due to factors including a limited seasonal production, packing operations located in a secondary facility, or insufficient capital resources to construct a permanent facility more affordable and scale-appropriate portable units are desired.

Several years ago, Kitinoja and Thompson (2010) provided a detailed overview of various pre-cooling systems for small-scale producers. Additional design information for inexpensive and portable systems have been published in extension bulletins, such as Portable Forced-Air Cooling Capacity (NCSU AG-414).

Commercial systems for rapidly deployable pre-cooling capacity are available including those available from Global Cooling Inc. and TRJ Refrigeration, Inc. For these commercial capacity systems, cold room capacity is still a requirement but forced-air cooling is definitely an important incremental improvement over simple room-cooling for reducing produce weight loss (revenue), and extending visual as well as sensory quality. Always be aware of the compatibility of any cooling method with individual product traits and tolerances. For example, during forced-air cooling, some products like broccoli might be highly susceptible to moisture loss and shriveling. This would result in significant weight loss and unacceptable product quality. For more information on cooling methods and their application to diverse horticultural commodities see [Commercial Cooling of Fruits, Vegetables, and Flowers](#) publication available for sale from the Postharvest bookstore.

Pre-cooling systems for small-scale producers Lisa Kitinoja and James F Thompson

Stewart Postharvest Review 2010, <http://ucce.ucdavis.edu/files/datastore/234-1594.pdf>

NCSU AG-414 Portable Forced-Air Cooling Capacity

<http://www.bae.ncsu.edu/programs/extension/publicat/postharv/ag-414-7/>

Global Cooling Inc. <http://www.pre-coolers.net/>

## On Our Website

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



### New Publications on our Website

Vazquez-Gutierrez, J. L., Quiles, A., Vonasek, E., Jernstedt, J. A., Hernando, I., Nitin, N., & Barrett, D. M. (2016). [High hydrostatic pressure as a method to preserve fresh-cut Hachiya persimmons: A structural approach](#). *Food Science and Technology International*.

doi:10.1177/1082013216642049

Fresnedo-Ramírez, J., Frett, T. J., Sandefur, P. J., Salgado-Rojas, A., Clark, J. R., Gasic, K., Gradziel, T. M. (2016). [QTL mapping and breeding value estimation through pedigree-based analysis of fruit size and weight in four diverse peach breeding programs](#). *Tree Genetics & Genomes*, 12(2).

doi:10.1007/s11295-016-0985-z

Donis-González, I. R., Guyer, D. E., & Fulbright, D. W. (2016). [Quantification and identification of microorganism found on shell and kernel of fresh edible chestnuts in Michigan](#). *Journal of the Science of Food and Agriculture J. Sci. Food Agric.* doi:10.1002/jsfa.7667

Burch, A., Do, P., Sbodio, A., Suslow, T. and Steven Lindow. 2016. [High culturability of epiphytic bacteria and frequency of biosurfactant producers on leaves](#). **Accepted manuscript posted online 29 July 2016, doi:10.1128/AEM.01751-16**AEM.01751-16

## Postharvest Positions

### Lecturer/Senior Lecturer - Agriculture

With over 35,000 students across 24 learning centres, CQUniversity Australia is one of the leading providers of Distance Education in Australia. Within the School of Medical and Applied Sciences, you will have the opportunity to join a growing agriculture teaching and research program in a major agricultural production region. You will join a team delivering a unique Agriculture degree program featuring substantial industry engagement. You will also be part of a research team in Bundaberg that, in partnership with the Queensland Government Department of Agriculture and Fisheries, provides research support to one of Australia's largest horticultural production regions.

As an Academic, you will make significant contributions to the teaching efforts of the School, in order to help your industry grow.

- You will be expected to play an integral role in scholarship and research activities.
- As a member of the program academic team, you will lead and participate in the delivery of foundation and professional-focused units across multiple campuses.

See the [full announcement here](#).

## Postharvest Calendar

- 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
- November 1-3, 2016. [Produce Safety Workshop](#). UC Davis campus
- October 11-14, 2016. [Postharvest Technology Course](#). Wageningen Campus, The Netherlands
- February 7, 2017. [FRUTIC Symposium](#). Berlin Germany
- February 8-10, 2017. [Fruit Logistica](#). Berlin, Germany
- July 18-20, 2017. [IX Congreso Iberoamericano de Tecnología Postcosecha y Agroexportaciones](#). UC Davis campus

## Ask the Produce Docs

**Q.** I have some questions concerning bitter pit in apple:



1. May late harvest increase the post-harvest incidence of bitter pit in apple?
2. Aside from the harvest time, may ethylene exposure during cold storage enhance bitter pit?
3. May we expect higher ethylene production by apples affected by bitter pit? (M.S.)

**A.** I can help with your questions.

1. Usually if there is a pattern with harvest, it is earlier harvested fruit that are more susceptible.
2. No ethylene will not enhance bitter pit.
3. Yes, when fruit are affected by a disorder like bitter pit, they will generally have a higher ethylene production.

--Beth Mitcham

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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](mailto: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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