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## Director's Update



### Kick-off to a New Vision for PTC

Don't know about you ... but my New Year started off with a bang and a flurry of activity right where I left off in 2016. From what I hear, it is pretty much the same for all.

For 2017, we are introducing some new approaches to our core programs and responding to new challenges to fulfill our mission within the shifting land grant institution priorities. I spent a good amount of effort over the past several months listening and talking to diverse clientele about how we can enhance our extension and outreach service and value. Naturally, there are diverse interests, opinions, and specifics on your information and technology-support wish lists. Some but not all have a scale-associated focus. These interactions, especially over the past two months being highly populated with multiple industry meetings and training sessions, support my assessment that our evolving vision must incorporate enhancing our relevance and responsiveness. I appreciate the many positive sources of encouragement to further develop a leadership role within and involving the continuum from fundamental discovery to near-turnkey applied objective third-party assessments and research information. Look for more details of how this will take shape in the coming months within the UC Postharvest Technology Center activities and announcements.

To kick-off some changes, based on your input, I would like to highlight two significant new items for 2017. While both are deeply linked to our foundation and long-standing programs, we are pleased to announce some new features we hope will be of broad interest and value.

Firstly, in substantial carry-over from the leadership of former Director Beth Mitcham, the first of the mobile-friendly Apps has just been released. The process to completion was long and perhaps could have been even more complex to get it right and 'publication-ready' within the UC system, but that is hard to imagine. However, it is now available and Beth and her team worked very hard to ensure its functionality and fidelity to our website. As a global resource, the UC Postharvest Technology Center website is visited over 3 million times a year and contains more than 660 pages and 750 documents with postharvest information and related resources. This first in the line of mobile-friendly versions of our most frequently accessed page, the Postharvest Technology Center Produce Facts Sheets, are widely used by the produce industry, service and affiliated industries, and researchers. The App, **only available for iPhone users at this time**,

can be used to search for information about recommendations for handling after harvest for Fruits, Vegetables, and Ornamentals, with subsections of information for each commodity such as Maturity & Quality, Disorders, and Optimal Temperature / Atmosphere for Storage.

You can access our **free** Produce Facts app here\* (<https://itunes.apple.com/us/app/produce-facts/id1192176504?ls=1&mt=8>) or by searching UC Davis Postharvest Technology in your Apple App Store! Let us know how this works for you.

The second new look comes direct from my interactions with a broad brush-stroke of the industry. To be brief, a major theme of the input reflected the universal limitations of time for attending short courses due to busy schedules and the challenges for many of year-round sourcing with no such thing as a slow time of year. The expressed desire was for more limited duration and topic-focused workshops for postharvest fundamentals, produce safety principles, and new technologies for maintaining quality and safety. In response, our first experimental ventures to accommodate these requests are the newly introduced 2-day option for our annual [Postharvest Technology Short Course](#) and the planned one-day *Bootcamp Series*, currently in development. The 2-Day Short Course option is targeted at those wishing to get a broad introductory or refresher overview of primary postharvest principles and management including postharvest handling specifics for many key commodities. The revised program will include all the fundamentals and a lot of new content to bring our program current with industry practices. So please plan to join us for the first two days of the course (June 19 and 20, 2017) or for the full two weeks.

There are a number of changes planned for 2017, including mechanisms to respond to the requests that come to us for short-term research evaluations. As always, we look for and value your input and feedback as we look to refine and implement a new vision for the UC Postharvest Technology Center.

### Scholarship Available for Postharvest Technology of Horticultural Crops Short Course

Applications are being accepted for the 2017 UC Davis Postharvest Technology of Horticultural Crops Short Course Scholarship. The scholarship provides the opportunity for an individual(s) from a developing country to participate in the annual UC Davis Postharvest Technology of Horticultural Crops Short Course and field tour this year from June 19 – 30, to learn first-hand about postharvest fundamentals, optimal handling and specific practices for key horticultural crops.

The goal of the scholarship opportunity is to further the education of individual(s) pursuing a career in horticultural science who otherwise would not have the opportunity to participate in postharvest horticultural training in a developed country and who will take the knowledge gained back to their home country to benefit others in the region. Depending on the qualifications among the pool of applicants, we will award a full or substantial partial scholarship. At least some level of matching funding is required from the applicants government, institution, or other benefactor is required and should be described in the application.

Interested individuals who meet the criteria described above should apply through the Postharvest Technology Center website at [this link](#) no later than 11:59 p.m. (PST) on January 31, 2017.

The scholarship package (valued at least to a level of \$4,500) includes the following:

- Class registration for the two-week classroom and field-based course
- Course materials
- Hotel accommodations (single lodging)
- Meals
- Ground transportation from the Sacramento International Airport (SMF) or San Francisco International Airport (SFO)

The selected recipient shall be responsible for air travel to SMF or SFO, personal expenses, passport, travel visa, and other related costs not described above.

Applications will be reviewed by a panel of UC Davis Postharvest Specialists. The selected recipient will be notified no later than February 25, 2017.

This scholarship opportunity is available through support from the Leonard and Marsaille Morris Trust and additional donations to the UC Postharvest Technology Center. If you would like to contribute to the matching funding portion of this much needed scholarship program to enable the selection of more recipients, please [click here](#). Many small donations will collectively make a big difference to a worthy and motivated young professional.

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## Please Give to the Postharvest Endowment



**It's never too late to give!** The Center receives minimal institutional support and operates predominantly on extension programming, external funding and private contributions. So a big thanks to all the contributors to our Endowment! To date, we have been able to continue offering and improving the valuable resources found at our website. Our endowment fund was established in 1989 as a main renewable revenue source to support extension and applied research activities related to fresh produce. There are three main funds associated with the endowment:

- **Postharvest Student Support.** Your gift provides access to students who would not otherwise afford to attend UC Davis, and also contribute to their professional development.
- **Postharvest Program Endowment.** These funds are the main support for the maintenance and improvement of the center website that is accessed by almost 30,000 users a month from all reaches of the world.
- **Postharvest Technology Center.** Giving to this fund will strategically support the highest priority activities. Our current priority is to leverage these funds for preliminary research to be used in application to federal and foundation grant programs and to expand our resources for distance-learning and global outreach.

Thank you in advance for your tax-deductible donation! Your support is greatly appreciated and will be used to help us carry on the mission of reducing postharvest losses and improving the quality and safety of produce around the world. You can [donate online here](#) or call the Postharvest Technology Center at 530-752-6941 to talk to us in person.

## Postharvest Education at UC Davis



### Now Open!

#### Fruit Ripening & Ethylene Management Workshop – April 18-19, 2017

We encourage anyone interested to enroll soon for the 23rd annual Fruit Ripening & Retail Handling workshop. The workshop will be held April 18-19, 2017 at the Conference Center on the UC Davis campus. This workshop is intended for shippers, fruit handlers (wholesale and retail), and produce managers who are involved in the handling and ripening of fruits and fruit-vegetables. The workshop is coordinated by Drs. Mary Lu Arpaia and Florence Zakharov, and will focus on managing the effects of ethylene, reducing losses at the receiving end, and delivering ready-to-eat, delicious fruits and fruit-vegetables to the consumer. Registration for this 2-day workshop is priced at \$885 and includes all instruction, instructional materials, morning and afternoon coffee, and two lunches. Space is limited. To register, or for more information, see the [webpage](#) or contact [Ms. Penny Stockdale](#).

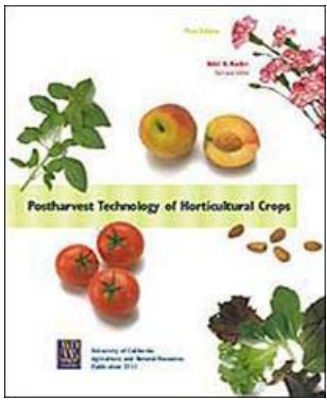
#### Postharvest Technology of Horticultural Crops Short Course June 19-20 (two day) 19-23 (week one) and June 26-30 (optional tour), 2017

New this year! We are offering a limited number of seats in a 2-day Postharvest Fundamentals and Commodity Profiles portion of the short course. This world-renown course is an intensive 2-day or 1 or 2-week study of the biology and current technologies used for handling fruits, nuts, vegetables and



ornamental crops in California. The first week includes the already-mentioned fundamentals and commodity profiles plus lectures and hands-on demonstrations, and the optional 2nd week is a field tour that will visit a broad spectrum of postharvest operations in California's great central valley and coastal regions. For more information or to enroll, visit the [webpage](#), or contact [Ms. Penny Stockdale](#).

## Featured Postharvest Bookstore Item



### Receive 25% off this month's featured publication: Postharvest Technology of Horticultural Crops

Through the end of January, we're offering a 25% discount on [Postharvest Technology of Horticultural Crops](#). Edited by Adel Kader and written by 22 authors, including UC researchers, specialists, and faculty along with leading industry experts. This is an invaluable resource for research professionals, quality control personnel, and postharvest biology students – anyone involved in the technology for handling and storing fresh fruits, vegetables, and ornamentals, applicable worldwide. Contains 535 pages, 154 color photos, 184 black-and-white photos, and 111 graphs and illustrations. Five chapters cover consumer issues in quality and safety, preharvest factors affecting fruit and vegetable quality, waste management and cull utilization, safety factors, and processing methods. An appendix presents a summary of optimal conditions and the potential storage life of 200 fruits and vegetables. To order a copy, please use our [online order form](#) and note "PTHC25" to receive your discount.

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

## Postharvest Specialists' Updates & Other News



### Christine Bruhn Attends Codex Committee on Food Hygiene

Christine Bruhn addressed, "Do Consumers Really Do What They Say They Do" as the featured speaker at Walmart's recent Emerging Issues program. The presentation, given in Bentonville Arkansas was broadcast throughout the Walmart Corporation in the US and in China.



### Trevor Suslow to Share Webinars

Trevor participated in two produce industry activities focused on establishing baseline on-site validation data for recirculated cooling water systems, cleaning and sanitation verification protocols, and piloting new antimicrobials for wash water. All these short-term studies will be shared in webinars during the first half of 2017.



## Resource Spotlight



### Marita Cantwell Sees Acta Horticulturae #1141 Through to Publication

Acta Horticulturae #1141, the proceedings of the III International Fresh-cut Conference held at UC Davis in 2015 has now been published by ISHS. Registered conference attendees will receive the Acta Hort volume by mail; Papers can be accessed online at <http://www.ishs.org/ishs-book/1141>

### Climate friendly farming and postharvest technology

By Heidi Meier\* and Trevor Suslow

For decades, international policy makers, farmers, and research experts have worked collaboratively to update and improve agricultural procedures and policies to reduce greenhouse gas emissions. More recently, the U.S. has begun to devote resources to encourage and support global climate change mitigation efforts.

In 2014, the US Environmental Protection Agency (EPA) cited ag-operations as responsible for 9% of domestic greenhouse gas emissions, encouraging farmers to invest in green technologies that would reduce ag's carbon footprint.

In the Pacific Northwest, the Center for Sustainable Agriculture and Natural Resources launched a Climate Friendly Farming Project (CFF), and a growing number of ag-innovators nationwide have united in the movement. With partnership contribution from the USDA, the CFF aims to understand the relationships between ag-operations, carbon sequestration, and their effect on greenhouse gas emissions with an end goal of improving the resiliency of agriculture to a changing climate.

As an incentive to reduce ag's carbon footprint and improve soil health, the USDA's Natural Resources Conservation Service of California offers financial assistance and easements to progressive and sustainable projects that mutually benefit agriculture and the environment.

To meet these goals, some farmers are experimenting with cover crops that replenish soil with carbon taken from the atmosphere and reduce the need for fossil-fueled farm equipment for tilling in between harvests.

But legislators and climate change experts spotlight a need for systemic change in the ag- industry to adapt to the quickly changing climate and have pressed government agencies for tighter legislation surrounding carbon emissions from ag-operations.

Some of the aforementioned methods of initiating climate friendly farming practices, like cover crop experimentation, pose auxiliary problems, like an increased risk or changing profile of plant and human pathogen prevalence and persistence. From a food safety perspective, this may result in an elevated frequency of food-borne pathogen detection. A recent study published in Applied and Environmental Sciences (Reed-Jones et.al. Appl. Environ. Microbial. March 2016 vol. 82 no. 6 1767-1777) highlights some of these concerns. Our own studies conducted at UC Davis and in parallel by collaborators at the University of Sydney over two years (summary report currently available at the [Center for Produce Safety](#)) evaluate cover crops and solarization for remediation of Salmonella contaminated field soils and identify some opportunities, but also the need for assessments under a broader range of conditions.



*Baby spinach was replanted into field soil heavily contaminated with an avirulent Salmonella Typhimurium after incorporating green cover crop residues. No detectable recovery of the marked isolate was detected at harvest maturity although low levels of Salmonella could be recovered on some of the replicated plots. In our studies, Buckwheat (*Fagopyrum esculentum*) provided the most rapid decline in inoculated challenge studies.*

In keeping with the goals of Climate Friendly Farming, postharvest researchers are challenged with developing new, more environmentally friendly technologies while maintaining current food quality and sanitation specifications.

One of the most obvious shifts toward sustainable future in agriculture is using alternative and renewable energy in place of fossil-fuels. But the shift has been widely debated because of its high start-up costs and the uncertainty of its efficiency, longevity, and reliability.

The transition to renewable technology in postharvest operations poses a potential risk to food safety and could increase postharvest losses, but long-term benefits include lower operating costs and a reduced carbon footprint. As ag-innovation subsidies become available, researchers can continue to evolve climate friendly farming technology.

For more information, visit...

<http://csanr.wsu.edu/program-areas/climate-friendly-farming/>

<https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions>

<http://kvpr.org/post/california-farmers-say-healthier-soil-could-improve-air-quality-grow-tastier-produce>

<http://ucce.ucdavis.edu/files/datastore/234-1386.pdf>

<https://www.nrcs.usda.gov/wps/portal/nrcs/site/national/home/>

[https://www.nrcs.usda.gov/Internet/FSE\\_DOCUMENTS/nrcs141p2\\_002437.pdf](https://www.nrcs.usda.gov/Internet/FSE_DOCUMENTS/nrcs141p2_002437.pdf)

\* Heidi Meier is a new PTC Program Support Associate with responsibilities including communications and web-social media content development and tracking.

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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 from the International Conference on Fresh-cut Produce Held Fall 2015 on the UC Davis Campus

L. Mastrandrea, M.L. Amodio, and M.I. Cantwell (2016). [Modeling ammonia accumulation and color changes of arugula \(\*Diplotaxis tenuifolia\*\) leaves in relation to temperature, storage time and cultivar](#). Acta Hort. 1141. ISHS 2016. DOI 10.17660/ActaHortic.2016.1141.34 Proc. III Int. Conf. on Fresh-cut Produce: Maintaining Quality and Safety, Ed.: M.I. Cantwell

G. Hong, C. Crisosto and M.I. Cantwell (2016). [Quality and physiology of two cultivars of fresh-cut figs in relation to ripeness, storage temperature and controlled atmosphere](#). Acta Hort. 1141. ISHS 2016. DOI 10.17660/ActaHortic.2016.1141.25, Proc. III Int. Conf. on Fresh-cut Produce: Maintaining Quality and Safety, Ed.: M.I. Cantwell

F. Tanamati, G. Hong and M.I. Cantwell (2016). [Impact of storage temperatures and modified atmospheres on quality of fresh-peeled garlic cloves](#). Acta Hort. 1141. ISHS 2016. DOI 10.17660/ActaHortic.2016.1141.26, Proc. III Int. Conf. on Fresh-cut Produce: Maintaining Quality and Safety, Ed.: M.I. Cantwell

T. Wang, Q. Wang, F. Pupin and M.I. Cantwell (2016). [Control of red discoloration of fresh-cut sunchoke Tubers](#). Acta Hort. 1141. ISHS 2016. DOI 10.17660/ActaHortic.2016.1141.44, Proc. III Int. Conf. on Fresh-cut Produce: Maintaining Quality and Safety, Ed.: M.I. Cantwell

M.I. Cantwell, A.A.M. Melo, G. Hong and S. Klose (2016). [Quality of waterjet- and blade-cut romaine salad](#). Acta Hort. 1141. ISHS 2016. DOI 10.17660/ActaHortic.2016.1141.17, Proc. III Int. Conf. on Fresh-cut Produce: Maintaining Quality and Safety, Ed.: M.I. Cantwell

M.I. Cantwell, G. Hong, L. Schmidt and H. Ermen (2016). [Impact of modified atmospheres on the vitamin C content of salad-cut romaine and other lettuces](#). Acta Hortic. 1141. ISHS 2016. DOI 10.17660/ActaHortic.2016.1141.19, Proc. III Int. Conf. on Fresh-cut Produce: Maintaining Quality and Safety, Ed.: M.I. Cantwell

M. Buccheri and M.I. Cantwell (2016). [Fruit ripening conditions affect the quality of sliced red tomatoes](#). Acta Hortic. 1141. ISHS 2016. DOI 10.17660/ActaHortic.2016.1141.18, Proc. III Int. Conf. on Fresh-cut Produce: Maintaining Quality and Safety, Ed.: M.I. Cantwell

K. Alborno and M.I. Cantwell (2016). [Fresh-cut kale quality and shelf-life in relation to leaf maturity and storage temperature](#). Acta Hortic. 1141. ISHS 2016. DOI 10.17660/ActaHortic.2016.1141.11, Proc. III Int. Conf. on Fresh-cut Produce: Maintaining Quality and Safety, Ed.: M.I. Cantwell

M.E. Saltveit (2016). [The three responses of plant tissue to wounding](#). Acta Hortic. 1141. ISHS 2016. DOI 10.17660/ActaHortic.2016.1141.2, Proc. III Int. Conf. on Fresh-cut Produce: Maintaining Quality and Safety, Ed.: M.I. Cantwell

## Postharvest Positions



### Postharvest Researcher - Rijk Zwaan, Fijnaart, Netherlands

Rijk Zwaan is an international family company with a people-oriented culture. Rijk Zwaan is right at the start of the food chain. We develop vegetable varieties and sell the seeds produced from them globally.

The job of Researcher is an extension within this department, specifically aimed at post harvest issues. Within this role the candidate is responsible for planning postharvest projects with various (project) teams and departments. The candidate will bring knowledge about setting up a proper statistical test arrangements and organize their implementation.

Please find the full job description and contact information [here](#).

## Postharvest Calendar

- 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
- June 19-30, 2017. [Postharvest Technology of Horticultural Crops Short Course](#). UC Davis Campus and Central CA
- 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
- September 26-28, 2017. [Fresh-cut Products: Maintaining Quality & Safety Workshop](#). UC Davis Campus
- October 17-20, 2017. [International Postharvest Unlimited Conference \(ISHS\)](#). Madrid, Spain

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## Ask the Produce Docs

**Q.** Can someone please advise if iceberg lettuce with the russet spotting is harmful to ingest? (L.K.)



**A.** Russet spotting is strictly a visual defect. It is due to formation of colored compounds from simple phenolics and is generally induced by ethylene exposure in the postharvest environment. It is in no way harmful to eat lettuce that has those discolored spots. That being said, you want to clearly identify it as russet spotting and not some other problem (like bacterial).

Marita Cantwell

## 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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