



October 2012

News from the UC Davis Postharvest Technology Center

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Director's Update



***Reunite and Rediscover!***  
**UC Davis Reception at PMA's Fresh Summit**

We already have a great roster of guests who have RSVPd for our October 27<sup>th</sup> reception at the PMA Fresh Summit International Convention in Anaheim.

This exciting event will provide a great networking opportunity, as well as a chance to showcase some of the many exciting projects going on at UC Davis! If you've attended UC Davis, partnered with UC Davis, or are simply interested in learning what's new at UC Davis, we warmly welcome you to attend this reception.

We are very grateful to our sponsors who have partnered with us to make this event possible, and we welcome additional sponsors. Please contact me for more information at [ejmitcham@ucdavis.edu](mailto:ejmitcham@ucdavis.edu).

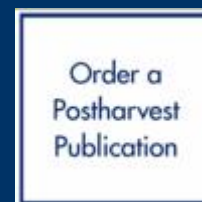
I look forward to seeing many of you in Anaheim, and invite you to complete the online [RSVP form](#).

--[Beth Mitcham](#)

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## Postharvest Workshops at UC Davis

### Registration Countdown: UCGAPs Practical Skill Building for On-Farm Risk Assessments Workshop



On November 5, [Dr. Trevor Suslow](#) will be presenting a one-day workshop that will provide entry-level information for businesses beginning to respond to the need to have a food safety management plan that addresses key risks and controls that prevent contamination. Growers, shippers, brokers, farm supervisors, and packinghouse managers will benefit from the development and improvement of skills in hazard identification and risk-based corrective actions that are essential to designing and implementing an on-farm safety plan.

There will also be a half-day optional “build your own on-farm food safety manual” session on November 6<sup>th</sup>. For more information or to register, visit the workshop’s [web page](#), or contact [Ms. Penny Stockdale](#), Registration Coordinator.

### September 17-19 Fresh-cut Workshop Well-Received

The 17<sup>th</sup> annual Fresh-cut Products: Maintaining Quality & Safety workshop organized by [Dr. Marita Cantwell](#), was very well attended, and there was an exceptional level of interaction between the participants and instructors. More than 20 top government, academia and industry instructors shared their expertise on a wide array of topics.



Participants found the course very beneficial, and responded with positive feedback including comments such as, “This course was worth every penny and minute dedicated to it. Thanks” and “A very good and educating course for people from production to retailers/distributors to packaging and the research department. Love this workshop, though it is pretty intensive. Thank you!”

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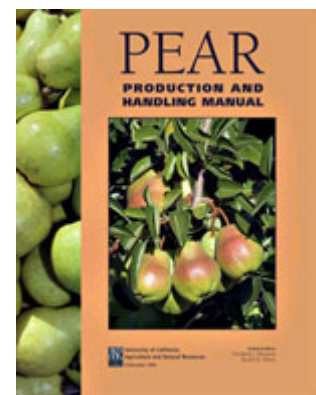
## Featured Postharvest Publication

### 30% Discount Offered on “Pear Production and Handling Manual”

Through the end of October, we are offering a 30% discount on this helpful manual.

Content includes introduction and pear industry overview, pear orchard and tree management, irrigation and fertilization of pears, pest management in pears, postharvest handling of pears, and 15 pages of color plates.

Regularly \$25.00, this publication is now on sale for only \$17.50. United States and Canadian shipping addresses may order using our [online shopping site](#). Other shipping addresses please use our printable [order form](#), and note “30%Pear”.



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## Postharvest Specialists Activities

### Announcing the Launch of the first Horticulture CRSP-Sponsored Postharvest Training and Services Center on the AVRDC Campus

On October 12, 2012, the first Postharvest Training and Services Center (PTSC) will officially open its

doors. Located on the AVRDC-The World Vegetable Center's Regional Center for Africa Campus in Arusha, Tanzania, the Center will serve as a model for postharvest development in Sub-Saharan Africa.

Physical losses of horticulture crops during postharvest range from 30 to 80 percent in Sub-Saharan Africa, and problems with food quality, safety and nutritional value are well documented. Because past projects have identified appropriate postharvest technologies and recommended a variety of training, capacity building and small-scale infrastructure development, but had not integrated these recommendations into local solutions, the Horticulture CRSP awarded a Pilot Project in 2011 to [Diane Barrett](#) of University of California, Davis, Lisa Kitinoja of the World Food Logistics Organization, and Rob Shewfelt of University of Georgia. Drs. Barrett, Kitinoja, Shewfelt and others have been conducting a year-long, online training of 36 agricultural professionals in advanced postharvest technology. From October 8 to 19, these "Master Trainers" will complete their training in-person and officially open the first Postharvest Training and Services Center (PTSC) by participating in a series of training programs for local farmers in Arusha before returning to their own countries with the designs and tools needed to launch new PTSCs and provide similar services and training. This project and the PTSCs will provide access to training programs, adaptive research and demonstrations, and the needed tools and supplies in order to reduce postharvest losses and improve market access and incomes for smallholders and women farmers throughout Africa.

The Horticulture Collaborative Research Support Program (Horticulture CRSP) builds global partnerships for fruit and vegetable research to improve livelihoods in developing countries. The program is managed by UC Davis (directed by one of our own, [Beth Mitcham](#)) and funded by USAID. For more information, visit <http://hortcrsp.ucdavis.edu>.

### **Strawberry Cooling in Field**

Vegetable Growers News' August 15<sup>th</sup> article on [cooling strawberries in the field](#), included comments from emeritus UC Specialist Jim Thompson, who worked with Naturipe in developing an in-field cooling unit.

### **Invited Talk on Calcium Nutrition**

[Beth Mitcham](#) gave a keynote presentation at the International Workshop on Fruit Tree Nutrition and Soil Orchard Management in Yantai, China and a seminar at China Agricultural University in Beijing on September 3 -6, 2012 on her research related to the role of cellular calcium localization on fruit susceptibility to calcium deficiency disorders

### **Mango Import Update**

[Dr. Christine Bruhn](#) passed along the following update:

September 21, 2012: "Irradiation Treatment of Mangoes from India Upon Arrival in the U.S. - The USDA Animal and Plant Health Inspection Service (APHIS) has issued a Technical Amendment for its July 20, 2012 Federal Register Final Rule which `... among other things, allow for irradiation treatment of mangoes from India upon arrival in the mainland United States rather than just at the point of origin. In the final rule, we neglected to amend the inspection requirements to address shipments that are treated upon arrival in the United States and not at the point of origin. This document corrects that error [by allowing inspections to occur separately in India and the United States when appropriate] ..."

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### Postharvest Yellow Pages Listings Continue to Increase

The [Postharvest Yellow Pages](#) now includes more than 325 businesses whose contact information is updated annually. Listings include consultants, business services, and labs; controlled and modified atmosphere supplies; chemicals and quarantine treatment systems; cooling and refrigeration; environmental measurements; ethylene scrubbers and action inhibitors; facilities design and construction; fresh-cut and food service equipment and supplies; gas sampling, mixing and analysis; harvesting fruits and vegetables; packinghouses; produce and seed sources; produce expositions and newsletters; publishers; quality evaluation; ripening facilities and supplies; and transportation.

No endorsements of listed sites, supplies, or products is intended, nor criticism implied of those not mentioned. Recommendations for additions or corrections to listings are always welcomed.

### New Additions to Postharvest Publications Organized by Topic Library

*This library currently contains more than 1,500 postharvest articles and documents, organized by topic. It is searchable by title or author, and is one of the world's premiere sources of postharvest information.*

#### **Cooling**

Cantwell, M.I., A. Thangaiah, [Acceptable cooling delays for selected warm season vegetables and melons](#). Acta Hort 934 (2012) 77-84

N.C. State's Plants for Human Health Institute, [Mobile refrigeration trailer for N.C. farmers](#). (2012) 4 pgs.

#### **Marketing**

Klonsky, Karen, [Special Report: Marketing issues and opportunities in organic agriculture](#). UC Agricultural and Resource Economics Update. V. 15, no. 6, July/Aug. 2012, 16 pgs.

#### **Postharvest Losses**

Buzby, Jean D., Jeffrey Hyman, [Total and per capita value of food loss in the United States](#). Food Policy 37 (2012) 561-570

Kitinoja, L., H.Y. AlHassan, [Identification of appropriate postharvest technologies for small scale horticultural farmers and marketers in Sub-Saharan Africa and South Asia – Part 1. Postharvest losses and quality assessments](#). Acta Hort 934 (2012) 31-40

Saran, S., S.K. Roy, L. Kitinoja, [Appropriate postharvest technologies for small scale horticultural farmers and marketers in Sub-Saharan Africa and South Asia – Part 2. Field trial results and identification of research needs for selected crops](#). Acta Hort 934 (2012) 41-52

#### **Strawberry**

Macnish, Andrew J., Malkeet S. Padda, Francine Pupin, Pavlos I. Tsouvaltzis, Angelos I. Deltsidis, Charles A. Sims, Jeffrey K. Brecht, and Elizabeth J. Mitcham, [Comparison of pallet cover systems to maintain strawberry fruit quality during transport](#). HortTechnology 22 (2012) 493-493-501

## Postharvest Calendar

- October 15-19, 2012. [9th International Conference on Controlled Atmosphere and Fumigation in Stored Products](#). (CAF 2012). Antalya, Turkey.
- October 16-19, 2012. [X International Symposium on Postharvest Quality of Ornamental Plants](#). Porto de Galinhas, Pernambuco, Brazil. Contact Prof. Fernando Luiz Finger (55) 3138991128 or [ffinger@ufv.br](mailto:ffinger@ufv.br).
- October 26-29, 2012. [PMA Fresh Summit International Conference and Exposition](#). Anaheim, California.
- October 27, 2012. [UC Davis Reception at the Anaheim Marriott](#), PMA Fresh Summit International Conference and Exposition. 5-7 p.m. Anaheim Marriott Platinum 8 Room.
- November 5-6, 2012. [UC GAPs Practical Skill-Building for On-Farm Risk Assessments](#). UC Davis campus.
- November 18-23, 2012. [2012 International Citrus Congress](#). Valencia, Spain.
- November 25-28, 2012. [Postharvest Africa 2012](#): The 7<sup>th</sup> Technical Symposium of CIGR Section VI and 2nd International Conference on Postharvest Technology & Innovation. Stellenbosch, South Africa.
- February 6-8, 2013. [Fruit Logistica](#). Berlin, Germany
- March 18-19, 2013. [19th Annual Fruit Ripening & Retail Handling Workshop](#). UC Davis campus.
- April 23-24, 2013. [35th Annual Citrus Postharvest Pest Control meeting](#). Santa Barbara, California.
- April 28-May 2, 2013. [II International Symposium on Discovery and Development of Innovative Strategies for Postharvest Disease Management](#). Kusadasi, Turkey
- May 4, 2013. [IARW-WFLO Annual Convention and Expo](#). Hollywood, Florida
- June 3-7, 2013. [XI International Controlled and Modified Atmosphere Research Conference](#). Bari, Italy
- June 17-28, 2013. [35th Annual Postharvest Technology Short Course](#). UC Davis
- June 23-27, 2013. [VII International Cherry Symposium](#). Plasencia, Spain
- August 5-8, 2013. [International Symposium on Quality Management of Fruit and Vegetables for Human Health](#). Pattaya, Thailand
- August 19-21, 2013. [I International Symposium on Marketing and Consumer Research in Horticulture](#). Portland, Oregon
- September 2-5, 2013. [VI International Conference on Managing Quality in Chains MQIC 2013](#). Cranfield, United Kingdom
- September 17-19, 2013. [18th Annual Fresh-cut Products: Maintaining Quality & Safety Workshop](#). UC Davis campus
- June 10-13, 2014. [V International Conference Postharvest Unlimited](#). Lemesos, Cyprus
- June 16-27, 2014. [36th Postharvest Technology Short Course](#). UC Davis
- August 27-22, 2014. [XXIX International Horticultural Congress](#). Brisbane, Australia
- September 16-18, 2014. [19th Fresh-cut Products: Maintaining Quality & Safety](#). UC Davis

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## Ask the Produce Docs

**Q.** I would like to know about the acceptability of ethephon for banana ripening. Is it commercially acceptable to use it for banana ripening and if so, are there any specifications for its use? (M.A.)



**A.** Although ethephon is approved for preharvest application on processing tomatoes and table grapes with a maximum residue limit of 2 ppm, **it is not approved for postharvest application (direct spray or dipping) on bananas and other fruits to enhance their ripening.** However, it is possible to use ethylene gas liberated from ethephon to ripen fruits including bananas on a small scale if such a procedure is more economical than using ethylene gas from ethylene generators or gas cylinders with flow controls. In all cases, 100 ppm ethylene is the recommended concentration for stimulating faster and more uniform ripening of mature-green bananas. Also, optimal temperature (15-20 C) and relative humidity (90-95%) ranges must be provided regardless of the ethylene addition method. To release ethylene from ethephon, calculate the quantity needed based on the fact that 200 ml of ethephon (active Ingredient) will release 27 liters of ethylene gas when 85 g of caustic soda (NaOH) pellets are added to neutralize the ethephon. CAUTION! CAUSTIC SODA AND ETHEPHON ARE CORROSIVE. WEAR SAFETY GLASSES AND RUBBER GLOVES.

--[Adel Kader](#)

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**Q.** What are the differences between freezing injury and chilling injury?

**A.** Both are low temperature injuries, but for freeze damage to occur, the product must be below its freezing point. All products contain some sugar which means that the freezing point is always lower than that of water (32°F; 0°C). The exact temperature below 32°F at which the product will freeze will depend on the amount of sugar or soluble carbohydrate. For example, lettuce with a low sugar content may freeze at 31.7°F (-0.2°C) while plums with a very high sugar content may freeze at 29°F (-1.7°C) or lower. Much of the damage due to freezing results from the formation of ice crystals and the destruction of cell integrity once the product thaws, leading to the frequent symptoms of water soaked appearance, mushy texture, and complete collapse and breakdown of the damaged areas.

Chilling injury occurs at a range of temperatures that are low but nonfreezing for that product. The development of chilling injury depends on the specific temperature and time of exposure (see basil in the Herbs Produce facts at <http://postharvest.ucdavis.edu/pfvegetable/Herbs/> for a good example). Products differ in their susceptibility to chilling injury (see differences among eggplant types at <http://postharvest.ucdavis.edu/pfvegetable/Eggplant/>). Bananas are extremely chilling sensitive if stored below 55°F (12.5°C) for a few days while honeydew melons require weeks to show chilling symptoms at 41°F (5°C). Chilling injury symptoms vary depending on the commodity but often include surface discoloration, surface pitting, water soaked areas, lack of ability to ripen in fruits, and increased decay, among others. Another consideration for chilling injury is that sometimes the symptoms do not appear or are not as severe until the product has been removed from the low temperature storage and warmed (as can occur during marketing).

For further information on chilling and freezing injury see the summary written in the USDA Agricultural Handbook 66 (The Commercial Storage of Fruits, Vegetables, and Florist and Nursery Stocks) available at <http://www.ba.ars.usda.gov/hb66/contents.html>. Also check the storage summary for a wide range of products on our website at <http://postharvest.ucdavis.edu/files/109107.pdf>.

--[Marita Cantwell](#)

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- If you have a perplexing postharvest question that you'd like answered, please send it to [postharvest@ucdavis.edu](mailto:postharvest@ucdavis.edu)
  - Link to a data store of all our previous "[Ask the Produce Docs](#)" questions and answers, or link to archived copies of our [monthly E-Newsletters](#) as PDF documents.

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