



November 2009 News from UC Davis

POSTHARVEST TECHNOLOGY

Research & Information Center

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News from the Center

UC Davis Hosted Gates Workshop on Postharvest, November 10th – 12th

Specialists in the field of Postharvest Technology gathered from twelve countries to discuss their findings over the past year's study of postharvest losses for horticultural crops. After comparing notes on results to date from the Appropriate Postharvest Technology Planning Project, they broke into four teams focused on developing long-range, high-impact projects. Two teams focused on Sub-Saharan Africa, and two on South Asia.



Drs. Marita Cantwell, Beth Mitcham, Michael Reid, Adel Kader, and Jim Thompson from the Postharvest Technology Center played active roles, in conjunction with the project leader, Dr. Lisa Kitinoja, of the World Food Logistics Organization, and Drs. Paul Marcotte and Mark Bell from the University of California's College of Agriculture and Environmental Sciences' International Programs Office. Attendees included representatives from AVRDC, IITA, Amity University, KIST, Tamale PolyTechnic, ZEGA, DAI, Fintrac and ACDI/VOCA.

2010 Fruit Ripening & Ethylene Management Workshop to be held at the UC Kearney Agricultural Center

Enrollments have been rolling in for our first course of 2010. Under the leadership of Dr. Carlos Crisosto, the 16th Annual Fruit Ripening & Ethylene Management Workshop will be held February 25-26, 2010 at the UC Kearney Agricultural Center located in Parlier, California. The workshop is intended for shippers and destination (wholesale and retail) handlers who are involved in ripening fruits and fruit-vegetables. The workshop focuses on how to increase profits by delivering ready-to-eat, delicious fruits and fruit-vegetables to the consumer. The registration price will be \$700 for this 2-day workshop, please see the event's [web page](#) for complete information.



[Register On-Line](#)

With Appreciation! Year-end Postharvest Endowment Contributions

We offer our warmest thanks to those companies and individuals who have recently contributed to the Postharvest Endowment Fund, and have listed their names below. Unfortunately, we are still significantly short of our 2009 goal of \$550,000. Can you help? Please see our [Endowment web page](#) for additional information, or use our [printable form](#) to mail or fax in your contribution.

Catalytic Generators, LLC | The Ripening Advantage™ | EASIER | SAFER | SMARTER

<http://www.catalyticgenerators.com>

and
Adel & Aileen Kader
George & Claudi Wilson
See the Complete List of our [Endowment Contributors](#)

Central Valley Postharvest News Available

The late-October edition of Dr. Carlos Crisosto's Central Valley Postharvest News is now available:
http://www.uckac.edu/postharv/PDF%20files/CVPN_Oct09.pdf

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What's New on our Website this Month

Indonesian translation of "Small Scale Postharvest Practices" Updated

The table of contents of this translated version was recently updated by Made Utama.

- [Praktik-praktik Penanganan Pascapanen Skala Kecil: Manual untuk Produk Hortikultura](#)

All of the 10 translations of this "Small Scale Postharvest Practices" publication may be downloaded free of charge. A few translations (Spanish, French, Arabic, and English) are still available in printed format and may still be purchased using our [Order Form](#).

New additions to our Postharvest Publications Organized by Topic data store

With over 1,000 documents to choose from, our data store can serve as your personal postharvest library. It is searchable by author, topic, or title. Our new additions this month include:

- [General Interest Paper - History of Consumer Food Safety Education - Focus on Beef: Impact on Risk of Foodborne Illness](#), by Christine M. Bruhn. Food Protection Trends November 2009: 793-799.
- [Textural Changes of Asparagus in Relation to Delays in Cooling and Storage Conditions](#), by Luis Hernández-Rivera, Robert Mullen, and Marita Cantwell. HortTechnology July/Sept 1992: 378-381.
- [Minimizing Postharvest Diseases of Kiwifruit](#), by Noel F. Sommer, Robert J. Fortlage, Donald C. Edwards. California Agriculture January-February 1983: 16-18.

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Postharvest Center's Workshops @ UC Davis

2010 UC Davis Postharvest Opportunities

- **February 25-26: Fruit Ripening & Ethylene Management Workshop** - 16th Annual, scheduled to be held at the University of California's Kearny Agricultural Center in Parlier, California.
[Registration is now open.](#)
- **March 17-18, 2010. Juice Processing Course.** 2nd Annual, scheduled to be held on the UC Davis Campus.
- **May 5-7: Fresh Produce Marketing Strategies Short Course** - 2nd Annual, scheduled to be held in San Francisco. Please note the new date and the new location -- more details will be coming soon!
- **June 14-25: Postharvest Technology Short Course** - 32nd Annual, scheduled to be held on the UC Davis campus.
- **September 14-16: Fresh-cut Products: Maintaining Quality & Safety** - 15th Annual, scheduled to be held on the UC Davis campus

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Featured Postharvest Publication

In Keeping with the Fall Harvest Season...

Grape Publications Featured this Month

This month we are offering a 20% discount for customers who order any of our grape publications:



- [Harvesting and Handling California Table Grapes for Market](#)
- [Sulfur Dioxide Fumigation of Table Grapes](#)
- [Packaging California Table Grapes](#)

To order a copy for your library, please use our [Order Form](#), and be sure to note “November Grape Discount” on the order form.

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Postharvest Calendar: Upcoming Conferences, Courses and Workshops

- January 13, 2010. [Tomato Research Day](#). UC Davis Campus.
- February 1, 2010. [Tomato Processing School](#). Sacramento Convention Center
- February 3-5, 2010. [Fruit Logistica](#). Berlin, Germany.
- February 9-12, 2010. [Better Process Control School](#). UC Davis Campus
- February 25-26, 2010. [Fruit Ripening & Ethylene Management Workshop](#). 16th Annual. UC Kearney Agricultural Center.
- March 17-18, 2010. [Juice Processing Course](#). UC Davis Campus.
- May 5-7, 2010. [Fresh Produce Marketing Strategies Short Course](#). San Francisco, California.
- June 14-25, 2010. [Postharvest Technology Short Course](#). 32nd Annual. UC Davis campus.
- June 27 to July 2, 2010. [Gordon Research Conference on Postharvest Physiology](#). Tilton, New Hampshire, USA
- August 22-27, 2010. [28th International Horticultural Congress](#). Lisbon, Portugal.
- September 14-16, 2010. [Fresh-cut Products: Maintaining Quality and Safety Workshop](#). 15th Annual. UC Davis campus.

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Ask the Produce Docs

Q. We measured **residual SO₂ in table grapes** using Ripper method. We determined total, free and bound SO₂ in ppm by this method. Which parameter (total, free or bound SO₂) gives residual SO₂? As you know the maximum tolerance limit is 10 ppm for table grapes. Is it total, free or bound SO₂? (E.E.C.)

A. The Ripper method is an iodimetric reaction (oxidation/reduction) generally associated with free sulfites. The problem is that this method does not measure the presence of bound sulfites (usually addition compounds to carbonyl groups forming hydroxysulfonates) as bound sulfites are considerably more stable than free sulfites (sum of sulfites and bisulfites).

The official method for sulfite determinations is the Monier-Williams method (acid distillation) which is not fully ideal, but it is one officially on use. They are certified laboratories where samples can be sent for analysis.

My last reference on this is in 1978 (work done at Davis) “SO₂ Determination by Aeration-Oxidation: A Comparison with Ripper”, Buechsenstein and Ough, *Am. J. Enol. Vitic.*,1978; 29: 161-164 –[Carlos Crisosto](#)

Q. Dear Dr. Mitcham, My name is Tristan L. and I am in the 7th grade and am doing my science fair project on **storage methods for strawberries**. I have read a couple of your articles about strawberry post harvest technology and was wondering if you could clear up a few questions for me?

I stored 4 containers (holding 5 strawberries in each) in the fridge and examined them every day for 10 days and recorded how they decayed. I found that the strawberries stored in the clamshell containers (that they were bought in) went bad the fastest. My other methods of storage were Debbie Meyer Green bag (designed to absorb ethylene gas), Ziploc Fresh Produce bags (designed with Moisture Vents) and a plate covered in saran wrap.

All the containers formed mold on day 10 (except the clamshell). The clamshell containers were not edible on day 6 – but did not have mold, they shriveled and were very mushy. Is this because they were exposed to more carbon dioxide than the others? How does carbon dioxide affect strawberries in the refrigerator? What other factors could have made the clamshell containers become non-edible the fastest?

I am concluding that the Debbie Meyer bags worked the best because they absorbed the ethylene. Would you agree that this is reasonable? (T.L.)

A. Thanks for sharing the results of your science fair project with me. One of the things your experiment showed is that in addition to decay, water loss which leads to shrivel and loss of firmness is an important factor in the deterioration of strawberry fruit after harvest. In a future experiment, you could record details of shrivel and firmness of the berries as another parameter of product deterioration.

All of your berries were at the same temperature if they were in the same compartment of the refrigerator, but the relative humidity surrounding the fruit were changed by the storage conditions. The relative humidity around the fruit will be kept high when the fruit are in a plastic bag or covered with Saran wrap, while in the clamshell the relative humidity will be lower. The clamshell does not result in a high CO₂ atmosphere around the fruit because there is free air exchange through the large vents. In the Debbie Myer bags, and the Saran wrap covered tray, CO₂ would tend to accumulate within the bag. I am not familiar with the Ziplock Produce Bags, but I imagine they may allow some CO₂ to accumulate as well – your results would confirm this. Because CO₂ is a large molecule, it can be retained more easily than water vapor and this is why it accumulates while moisture is retained. The berries produce CO₂ and give up water vapor naturally and this is the source of these compounds within the package.

My experience with the Debbie Myer bags is that they do not work much better than a plain plastic bag. They do not seem to absorb much ethylene, and ethylene gas only has a minor effect on the decay of strawberries. The presence of CO₂ would be a much stronger effect. Your data seems to support that as well.

The most important factors for maintaining the quality of strawberry fruit after harvest are temperature (as close to 32 as possible), high relative humidity to reduce water loss (90 to 95% is best – 100% humidity can lead to water droplets that promote decay), and then elevated CO₂ concentrations (10 to 15% is best). Good luck on your project. –[Beth Mitcham](#)

Follow-up Note from Tristan L.: I received your e-mail and all of your information was greatly appreciated. I probably never would have been able to find anything as informative that I could comprehend. I sincerely appreciate your willingness to answer my questions.

I took the information that you sent to me and incorporated it into my project. The science fair judging was a few weeks ago and I wanted to let you know that I won first place in the 7th Grade category! I never could have won without your help. (T.L.)

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This publication is produced monthly by the UC Davis Postharvest Technology Research & Information Center. For more information visit our [website](#) or [e-mail](#) us. If you, or a colleague, wish to receive this free monthly E-Newsletter, click [here](#) to subscribe. If you do not wish to receive this publication, please click on “reply” to this e-mail and type “unsubscribe” in the subject line.

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