



March 2014

News from the UC Davis Postharvest Technology Center

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Director's Update

Scholarship Recipient Selected

With sincere thanks to the team of UC Cooperative Extension Specialists who carefully read and ranked all 140 applications for the 2014 Postharvest Technology of Horticultural Crops Short Course scholarship, we extend our [congratulations to Chiamaka Nwammadu](#). Chiamaka is currently a M.Sc. student in postharvest horticulture at the Federal University of Technology at Owerri, in Nigeria. We look forward to meeting Chiamaka in June!



Fruit Ripening & Retail Handling Workshop a Success

With nearly 50 participants representing a broad cross-section of the produce industry, and 13 instructors from both academia and industry, the March 25-26 Fruit Ripening & Retail Handling Workshop offered many opportunities for dynamic and interactive educational learning. Ripening of featured produce items included the "Art of Ripening Bananas", avocados, stone fruit, kiwifruit, mangoes and papayas, tomatoes, melons, and degreening of citrus. Overarching topics such as ethylene management, temperature management, ripening facilities, cold storage damage, flavor and aroma, and emerging ripening technologies were also discussed.

Thanks again to our Gold Sponsor, QA Supplies and Catalytic Generators, and our Bronze Sponsor, CID Bio-Sciences.

The 2015 workshop will held on March 24-25, and we hope you'll plan to join us!

--Beth Mitcham



Postharvest Education at UC Davis



36th Annual Postharvest Technology of Horticultural Crops Short Course

Enrollments are coming in quickly for the June 16-27, 2014 Postharvest Technology of Horticultural Crops Short Course. The course provides a one or two-week intensive study of the biology and current technologies used for handling fruits, vegetables and ornamentals in California. The first week will be held at the UC Davis Conference Center, and will include lectures and demonstrations on a broad spectrum of postharvest topics. The second (optional) week is a field tour visiting a variety of postharvest operations throughout California. The enrollment fee for the 1-week session is \$1975 and the enrollment fee for the 2-week session is \$2995 (plus additional required lodging fees). Attendance at the 1st week is a prerequisite to participating in the 2nd week field tour. To learn more, we invite you

to visit the [web page](#) or contact our Enrollment Coordinator, [Ms. Penny Stockdale](#).

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Featured Postharvest Bookstore Item

25% Discount on Produce Quality Rating Scales and Color Charts

Through the end of April we are offering a 25% discount on our useful publication "[Produce Quality Rating Scales and Color Charts](#)." The objective of this publication is to compile the rating scales (scoring systems) and color charts for maturity, ripeness, and quality of fruits, nuts, and vegetables for the benefit of those interested in produce quality evaluation. Available in printed format, or as a CD.

The regular price for the printed format is \$75/copy, now on sale for \$56.25. The regular price for the CD is \$50/copy, now on sale for \$37.50. The regular price when both items are ordered together is \$100, now on sale for \$80!

We invite you to order a copy for your library today. U.S. addresses only, please use our [online store](#). International addresses, please use our printed [order form](#). Please use the code "PQRS25%" to receive the discount.



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Postharvest Positions

Postharvest Technology Center Program Analyst

The UC Davis Postharvest Technology Center has an opening for a program analyst III who would be responsible for a broad range of policy level administrative support, programmatic activities and financial leadership for the Center. Expertise with graphic design, communications and outreach strategy, experience with web-based designs and tools, and budgetary oversight and strategic planning are required. An advanced degree in agriculture or related field is preferred, with a broad understanding of postharvest research. [Link here](#) for more information or to apply. Final filing date is April 4, 2014.

Postharvest Sales Representative Opportunity

AgriFind Executive Search is seeking a well-experienced sales representative for their client's fruit and vegetable produce packaging operations in Northern and Central Mexico. This position can be based in the US, preferably in southern Arizona (Phoenix, Tucson or Nogales). Candidates must have current or recent experience in postharvest packaging and possess the level of experience to conduct an audit assessment of a modern pack house operation. For a more detailed position description, please contact Xochilt Acosta at: xacosta@qualifindgroup.com Please put "*Postharvest Sales Role in Confidence*" in the subject line of your e-mail.

Postharvest Physiologist Position at UC Davis (repeat announcement)

UC Davis is recruiting a new Postharvest Physiologist at the Assistant to Associate level. We are especially looking for candidates who have experience with modern biology tools but also a strong foundation in postharvest biology and interest to research topics relevant to postharvest handling of horticultural crops. The successful candidate will establish a vigorous and dynamic research program as well as an innovative teaching program at both the undergraduate and graduate levels. The research will focus on postharvest biology of horticultural crops. It is expected that the research program will draw upon practical knowledge of postharvest processes and technology as well as upon related disciplines in genomics, plant pathogen interactions, biochemistry or plant developmental biology especially in areas such as senescence or fruit ripening. An intended outcome of these discoveries will be identification of processes or traits that can be manipulated to improve postharvest handling strategies and ultimately postharvest quality of fruits, vegetables or ornamentals. The position is a 9-month tenure track appointment. This position will include an appointment in the Agricultural Experiment Station, which includes the responsibility to conduct research and outreach relevant to the mission of the California Agricultural Experiment Station.

A Ph.D. in plant biology, horticulture, biochemistry, genetics or related discipline is required, with experience and documented interest in postharvest plant biology. International experience is desirable. Candidates should begin the application process by registering online at <http://recruitments.plantsciences.ucdavis.edu> Please include statements

of research goals for this position and teaching philosophy, *curriculum vitae*, publication list, copies of 3 of your most important research publications, copies of undergraduate and graduate transcripts (if within 5 years of either degree), and the names, e-mail addresses, and telephone numbers of at least five professional references. For technical or administrative questions regarding the application process please email kgeer@ucdavis.edu. Review of the applications will begin April 1, 2014. The position will remain open until filled.

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Postharvest Giving



Thanks to Our Contributors!

We extend our grateful thanks to the following individuals and companies who have recently contributed to the Postharvest Technology Center:

Companies

- [TRJ Refrigeration](#)
- [Red Rooster Co.](#)

Individuals

- Keri Morrelli
- Mauricio G. Rodriguez

See a complete listing of our [contributors](#), or make an [online gift](#) to the Postharvest Technology Center as an individual or on behalf of your company. All contributions are tax deductible within the U.S.

Postharvest Specialists' Updates & Other News

Barrett to hold Juice Processing Workshop May 5-6

Dr. Diane Barrett will be holding a Juice Processing Workshop May 5-6, 2014 at the UC Davis Conference Center. The course is designed for those industry and government professionals working in the area of juice analysis, quality, research standards and regulations. A background in chemistry, food science & technology, or food physics/food engineering is useful. For more information about the workshop see the [web page](#).

Better Process Control School a Success

There were almost 50 attendees at the annual in-person offering of Better Process Control School, organized by Dr. Diane Barrett. Held February 11-14 on the UC Davis campus, all participants passed their examinations, and will be given Certificates for this low acid/acidified food course.

Tomato Processing School

The Tomato Processing School was held in Sacramento on February 18, in collaboration with the annual Showcase of the California League of Food Processors (February 19-20). There were approximately 100 attendees.

Dept. of Food Science, Cornell University, Geneva and Ithaca campuses

Dr. Diane Barrett was invited to give the March 9-12 weekly seminar in the Department of Food Science at Cornell University, her alma mater. She spoke about "Research and Extension Challenges in the Land of Fruits, Vegetables and Nuts".

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What's New on Our Website

New this month in the "Postharvest Publications Organized by Topic" Library

This extensive [free postharvest resource library](#) currently offers more than 1,900 articles on a wide variety of topics.

Consumer Issues

Delgado, C., G.M. Crisosto, H. Heymann, C.H. Crisosto, [Determining the primary drivers of liking to predict consumers' acceptance of fresh nectarines and peaches](#). *Journal of Food Science* 78 (2013) 605-614.

Food Safety

Lopez-Velasco, G., A. Tomas-Callejas, D. Diribsa, P. Wei, T.V. Suslow, Growth of *Salmonella enterica* in pesticide solutions and its survival during field production and postharvest handling of fresh market tomato. Journal of Applied Microbiology 114 (2013) 1547-1558.

Marketing

Calvin, L., R. Cook, Commodity Spotlight: Exporters Target U.S. Asparagus Market, USDA Agricultural Outlook, April 1997, pgs. 20-23.

Wilson, P.N., G.D. Thompson, R.L. Cook, Mother Nature, Business Strategy, and Fresh Produce, Choices First Quarter 1997, pgs. 18-23.

Cook, R.L., C.F. Nuckton, W.E. Johnston, California Vegetable Crops: Production and Markets. Giannini Foundation Information Series No. 94-3, April 1994, 50 pgs.

Processed Fruits and Vegetables

Zhang, L., M.A. Schultz, R. Cash, D.M. Barrett, M.J. McCarthy, Determination of quality parameters of tomato paste using guided microwave spectroscopy. Food Control 40 (2014) 214-223.

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Postharvest Calendar

- April 26-30, 2014. Global Cold Chain Alliance Convention & Expo. San Diego, CA
- May 5-6, 2014. Juice Processing Course. UC Davis Campus
- May 26-29, 2014. The International Food Congress: Novel Approaches in Food Industry. Kusadasi, Turkey
- June 10-13, 2014. V International Conference Postharvest Unlimited. Lemesos, Cyprus
- June 16-27, 2014. 36th Postharvest Technology Short Course. UC Davis
- August 17-22, 2014. XXIX International Horticultural Congress. Brisbane, Australia
- August 25-29, 2014. Small-Scale Postharvest Horticultural Technologies Short Course & Study Tour. Bali, Indonesia
- September 16-18, 2014. 19th Fresh-cut Products: Maintaining Quality & Safety. UC Davis campus
- October 14-17, 2014. Postharvest Technology Course. Wageningen, The Netherlands
- November 4-6, 2014. 2nd Annual Produce Safety Workshop. UC Davis campus
- November 12-14, 2014. VII Congreso Iberoamericano de Tecnología Postcosecha y Agroexportaciones. Quito, Ecuador.
- March 24-25, 2015. 21st Fruit Ripening & Retail Handling Workshop. UC Davis campus.

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Ask the Produce Docs

Q. I would really like to understand how to calculate the percentage of dry matter in the avocado. I know that the avocado is weighed after it gets microwaved on medium power for 6 minutes. Any help you can give me about the specifics of this process would be appreciated. (C.G.)



A. I believe that you are interested in understanding how to measure dry matter in avocado using the microwave technique. Here is a [link to an article](#) which summarizes information regarding the current method used in California for dry matter determination. We did a lot of work in California to ascertain that a core sample taken at the equator of the fruit (widest point for Hass) gives a very good approximation of the entire dry matter of the fruit.

In terms of the actual protocol, the exact times for drying the samples and the power setting are dependent on the microwave you are using. If you plan to do many samples you should use a commercial grade microwave, not an inexpensive one designed for home use. You should make sure that you have one that has a rotating tray so that you get more uniform drying of the samples.

In short, the protocol is the following:

- 1) Select your fruit sample. If you are doing multiple fruit from a grower lot, try to group the fruit by size. We normally record the entire fruit weight for reference purposes and also peel color.
- 2) You will need a scale that measures to at least 0.01, 0.001 is even better.
- 3) Take your sample. We prefer the coring method for easy sampling and less knife work. Remove the peel and any seed material including the seed coat.
- 4) Weigh your sample. This should be done promptly since the sample will immediately start losing weight. We try to have at least a 3 to 5 gram sample from the fruit.
- 5) We use watch-glasses to hold the sample. Small glass petri dishes also work. Plastic petri dishes oftentimes become warped during microwaving.
- 6) Place the sample in the microwave. We use 30% power for the microwave we have, the idea is not to burn the samples since this will give you erroneous readings.
- 7) We have found that it takes about 30 to 40 minutes at 30% power. We remove the sample and weigh after about 30 minutes. The sample is then again placed in the microwave for an additional 5 minutes. The sample is weighed again and if the weight has not changed, it is finished. If the weight has changed, then place back in the microwave for an additional 5 minutes. Continue this process until you reach constant weight. An alternative is to use a fruit dehydrator. The samples will not burn using a dehydrator but it will take 3 to 4 days for the samples to dry to constant weight. As with the microwave you will need to take the samples out after 3 days, weigh them, and place them back in the dehydrator for 24 hours before reweighing.
- 8) Try NOT to burn the sample, this is where the power setting becomes important.
- 9) Some hints:
 - a. Low maturity fruit tend to burn more easily than samples from more mature fruit.
 - b. Very low dry matter fruit (<20%) can even ignite in the microwave. Why this is, I don't know, but if they do, you have to start over with that particular sample.
 - c. If you use the coring method you will have 2 plugs from the machine from opposite sides of the fruit (preferred). Try not to have the samples touch each other since this reduces the problem of ignition in the microwave. Again, why... I don't know.
 - d. We have found that taking opposite cores from the widest point of the Hass fruit that is approximately 220 grams will give you about a 3 to 5 gram sample, depending on the size of the seed.
 - e. Try not to touch the samples themselves when putting in and taking out of the microwave. The oil from your hands can change the weights.
 - f. You can put multiple samples (petri dishes) in the microwave at once. Obviously then you must be able to track each petri dish. We have found that nail polish is a good way to label the petri dishes. It will sustain washing of the petri dish so that each time you do measurements, you don't have to re-label the petri dishes.
 - g. Make yourself an excel spreadsheet to do the calculations automatically for you. This is what we do.

The calculation for dry matter determination is as follows.

You need the following pieces of information:

Petri dish weight

Initial sample weight + petri dish

Final weight of sample + petri dish

The calculation is:

Final weight/initial weight * 100 = Dry Matter %

For example:

Petri dish weight = 20 g

Petri dish weight + initial sample = 25 g

Initial weight = 25 - 20 = 5 g

Petri dish weight + final sample weight = 21 g

Final weight = 21 – 20 = 1 g
Dry matter = 1/5 * 100 = 20%

I hope this is helpful to you. Since you are in Mexico, I would also check with APEAM which is the avocado growers' association. They should have some set protocols for you to follow as well for dry matter determination.

--[Mary Lu Arpaia](#)

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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, 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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