



August-September 2012

News from the UC Davis Postharvest Technology Center

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Director's Update



You're Invited! UC Davis Reception at PMA's Fresh Summit

We're looking forward to our October 27th reception from 5-8pm at the PMA Fresh Summit Convention in Anaheim. This exciting first ever event will provide a great networking opportunity for all our UC Davis alumni and friends.



We will raffle off some great UC Davis gifts so mark your calendar now to attend. We hope many of you will join us in Anaheim, and invite you to complete the online [RSVP form](#).



If your company is interested to join as a sponsor of this event, please contact me at ejmitcham@ucdavis.edu.

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Our Center's team has been working hard on the final details for our [Produce Professional Certificate Program](#), which we will officially introduce at our Anaheim Reception. We are very excited about the many benefits this new certificate program will offer to employers and employees in the produce and supporting industries. This certificate program will recognize individuals who have obtained a critical level of produce knowledge that will be valuable in all aspects of the produce industry, including packaging, storage, transportation, fresh cut and retail.

--[Beth Mitcham](#)

Postharvest Workshops at UC Davis

Fresh-cut Workshop Nearly Sold Out!

Under the leadership of Dr. Marita Cantwell,

the 17th Annual Fresh-cut Products: Maintaining Quality & Safety Workshop will be held September 18-20 at the UC Davis Alumni Center. The workshop is presented by a cadre of 29 instructors, and enrollment is capped at 60 participants to ensure an optimal learning environment in this interactive course.

Fresh-cut Products:
 Maintaining Quality & Safety
 September 18-20, Davis, CA




Register Today!

One participant from last year's workshop enthusiastically reported, "Overall I enjoyed this workshop greatly, I would like to attend again. The course is well put together and all instructors were well prepared."

Registration is \$1,150 and includes three days of instruction, extensive instructional materials, three lunches, morning and afternoon snacks, and a networking reception. For more information or to register please visit the [web page](#), or contact [Ms. Penny Stockdale](#).

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Suslow plans UCGAPs Practical Skill Building for On-Farm Risk Assessments Workshop November 5-6



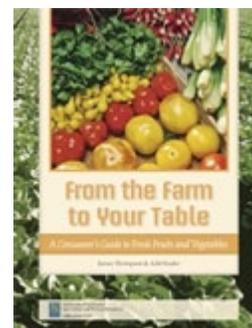
On November 6, Dr. Trevor Suslow will be presenting a one-day workshop that will provide entry-level information for businesses beginning to respond to the need to have a food safety management plan that addresses key risks and controls that prevent contamination. Growers, shippers, brokers, farm supervisors, 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 6th. For more information or to register, visit the workshop’s [web page](#), or contact [Ms. Penny Stockdale](#), Registration Coordinator.

Featured Postharvest Publication

Special 40% Discount Offered on “From the Farm to Your Table”

Through the end of September, we are offering an exceptional 40% discount on this interesting and helpful title. It will help you pick good-quality, healthy fruits and vegetables that are a vital part of our daily diets. Information is included about how growing and harvesting factors can affect quality, and the effects of growing locations, produce handling methods, and the various steps between production and retail markets. Regularly \$7.00, this publication is now on sale for only \$4.20. United States and Canadian shipping addresses may order using our [online shopping site](#). Other shipping addresses please use our printable [order form](#), and note “40%FFYT”.



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Postharvest Specialists Activities



Bruhn Receives IAFF Award

Christine Bruhn was recognized as a Fellow of the International Association for Food Protection at their annual meeting July 22 in Providence, Rhode Island. Christine and retired emeritus Cooperative Extension Specialist John Bruhn are the first husband/wife Fellows of the Association. Christine received the Educator award in 2005; John has received numerous recognitions from IAFF including Lifetime Membership.

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What's New on Our Website

New Addition to [Brief Book Review Datastore](#)

Dr. Adel Kader has reviewed the new book “Tropical and Subtropical Fruits: Postharvest Physiology, Processing and Packaging”, edited by Muhammad Siddiq (editor), and Jasim Ahmed, Maria Gloria Lobo, and Ferhan Ozadali (associate editors). Link [here](#) to read the complete review.

New Additions to Postharvest Publications Organized by Topic Library

This library currently contains more than 1,400 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.

This month we offer special thanks to Dr. Chien Yi Wang and Dr. Shioh Y. Wang, USDA researchers (retired) who have shared 75 articles they authored. A brief selection of these articles are listed below, there are an additional 66 articles that have been uploaded to our website.

Chilling Injury

Wang, C.Y. [Alleviation of chilling injury in tropical and subtropical fruits](#). Acta Hort 864 (2010) 267-273

Modified Atmospheres

Zheng, Y., C.Y. Yang, S.Y. Wang, W. Zheng. [Effect of superatmospheric oxygen on anthocyanins, phenolics and antioxidant activity of blueberries and strawberries](#). Acta Hort. 857 (2010) 475-482

Ayala-Zavala, J. Fernando, Shioh Y. Wang, Chien Y. Wang, and Gustavo A. González-Aguilar. [High oxygen treatment increases antioxidant capacity and postharvest life of strawberry fruit](#). Food Technology 45 (2007) 166-173

Phytonutrients

Jin, Peng, Shioh Y. Wang, Haiyan Gao, Hangjun Chen, Yonghua Zheng, Chien Y. Wang. [Effect of cultural system and essential oil treatment on antioxidant capacity in raspberries](#). Food Chemistry 132 (2012) 299-405

Jin, Peng, Shioh Y. Wang, Chien Y. Wang, Yonghua Zheng. [Effect of cultural system and storage temperature on antioxidant capacity and phenolic compounds in strawberries](#). Food Chemistry 124 (2011) 262-270

Wang, Chien Y., Chi-Tsun Chen, Shioh Y. Wang. [Changes of flavonoid content and antioxidant capacity in blueberries after illumination with UV-C](#). Food Chemistry 117 (2009) 426-431

Erkan, Mustafa, Shioh Y. Wang, Chien Y. Wang. [Effect of UV treatment on antioxidant capacity, antioxidant enzyme activity and decay in strawberry fruit](#). Postharvest Biology and Technology 48 (2008) 163-171

Wang, Chien Y., Shioh Y. Wang, and Chitsun Chen. [Increasing antioxidant activity and reducing decay of blueberries by essential oils](#). J. Agric. Food Chem. 56 (2008) 3587-3592

Squash

Zheng, Yonghua, Raymond W.M. Fung, Shioh Y. Wang, Chien Y. Wang. [Transcript levels of antioxidative genes and oxygen radical scavenging enzyme activities in chilled zucchini squash in response to superatmospheric oxygen](#). Postharvest Biology and Technology 47 (2008) 151-158.

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Postharvest Calendar

- September 18-20, 2012. [17th Annual Fresh-cut Products: Maintaining Quality & Safety Workshop](#). UC Davis campus.
- September 18-20, 2012. [II Asia Pacific Symposium on Postharvest Research Education and Extension: APS2012](#). Bogor, Indonesia
- 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.
- 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. 5-8 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 7th Technical Symposium of CIGR Section VI and 2nd International Conference on Postharvest Technology & Innovation. Stellenbosch, South Africa.
- March 18-20, 2013. [19th Annual Fruit Ripening & Retail Management Workshop](#). UC Davis campus.
- April 23-24, 2013. [35th Annual Citrus Postharvest Pest Control meeting](#). Santa Barbara, California
- 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 MQUIC 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. [Fresh-cut Products: Maintaining Quality & Safety](#). UC Davis

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Ask the Produce Docs

Q. I am a QA inspector at a distribution center for a large grocery chain. I was wondering what the difference is between a Clementine and a Mandarin or if there even is a difference. We received Mandarins in today instead of Clementines and I just was wondering if they are technically the same thing just different names? Thanks for your help. (J.H.)



A. My name is Tracy Kahn, and Dr. Mary Lu Arpaia asked me to provide you with some information about this topic. I am the curator of one of the most diverse collections of Citrus and Citrus relatives here at the University of California – Riverside. I also conduct research on new cultivars of citrus that are imported into California and the US. In addition the Citrus Variety Collection has a website (<http://www.citrusvariety.ucr.edu>) that I thought you might like to know about since you are asking questions about Clementines and Mandarins.

Mandarins refer to a group of cultivars and includes Clementine and Satsuma and many other mandarins. There are actually many selections of Clementine mandarins and some are more commercial than others with Clemenules Clementine being the most commercially grown of the Clementine mandarins. If you have heard of “Cuties” they are a marketing name used to pack Clementine mandarins before Christmas generally and W. Murcotts and Tango mandarins after the holidays. The word tangerine is often used interchangeably with the word mandarin but actually the term tangerine was coined for brightly colored sweet mandarins that were originally shipped out of the port of Tangiers Morocco to Florida in the late 1800s and the term stuck. Below this email note is the link and a section from the Citrus Industry Volume I Chapter 4 about mandarins. Another

interesting thing about mandarins is that we now know that there were three basic citrus types (mandarin, citron and pummelo) and that others that we think of as basic types or species (sweet oranges, sour oranges, grapefruits) are actually ancient hybrids or backcrosses of these. Also, many of the cultivars that we think of as mandarins or tangerines may in fact not be true mandarins, but actually mandarin hybrids.

–Tracy L. Kahn, Ph.D.

<http://websites.lib.ucr.edu/agnic/webber/Vol1/Chapter4.html> Citrus Industry Volume I Chapter 4

THE MANDARINS

Principal in importance in the Orient are the mandarins, a large, distinctive, and highly varied group that includes some of the finest and most highly reputed citrus fruits. Closer in resemblance to the oranges than to any of the other groups, these fruits are commonly referred to as mandarin or loose-skin *oranges*—a usage which is both unfortunate and confusing in view of the numerous, highly distinctive differences between the two groups. In the United States, where the name *tangerine* first came into common usage, mandarin and tangerine are used more or less interchangeably to designate the whole group. Since mandarin is the older and much more widely employed name, its use is clearly preferable. Presumably because of the orange-red color of the *Dancy* variety, which originated in Florida and was introduced in the markets as the *Dancy tangerine*, horticulturists have tended to restrict the use of the term tangerine to the mandarins of similar deep color. However, this is a usage of convenience only and the tangerines do not comprise a group of natural significance. The mandarin is the *mikan* of Japan, the *suntara* or *sangtra* (numerous modifications) of India, the *mandarino* of Italy and Spain, and the *mandarine* of French-speaking countries.

While the range of variation in characters exhibited by the mandarin group is much greater than in the oranges or pummelos and grapefruits and the existence of a number of species is indicated, the distinctive features of the group as a whole are as follows:

Fruit very small to medium (prevaillingly smaller than the oranges), oblate to highly compressed form; rind and fruit sections loosely adherent (more so than any of the oranges); open core (much more so than any of the oranges); flavor and aroma commonly distinctive; seeds with greenish cotyledons (minor exceptions).

Tree very cold-resistant (more so than any of the oranges) but fruit not; distinctive leaf petioles (wings line-margined with few exceptions); blade notch-pointed and with main vein prominent above as well as below; spines small and few or lacking; flowers single or in unbranched inflorescences and prevaillingly small (minor exceptions).

That the mandarin probably originated in northeastern India is strongly suggested by the existence in the forests of Assam of a primitive form, *Citrus indica* Tan., the so-called Indian wild mandarin, together with numerous mandarin hybrids and other and more highly developed forms not found elsewhere. It seems clear, however, that the King and *Kunenbo* mandarins must have originated in Indo-China and it is virtually certain that the satsuma mandarin had its origin in Japan. South China must also be the region of origin of some of the numerous mandarins. Finally, there is considerable reason for concluding that the Mediterranean mandarin, as the name indicates, originated under cultivation in Europe, presumably in Italy.

According to Webber (1943), the first mention of the mandarin in Europe relates to the introduction into England by Sir Abraham Hume in 1805 of two mandarins from Canton, China, one of which was described and illustrated in 1817 in the *Botanical Register* and the other in 1824 in *Andrews Botanical Repository*. Ziegler and Wolfe (1961) have concluded that one of these introductions was the highly reputed *ponkan*. That the mandarin had reached the Mediterranean basin somewhat earlier seems likely, however, for Risso and Poiteau (1818-22) mention a "mandarin orange" which had been known there "for some years" and Chapot (1962c) assigns the date of origin of the Mediterranean mandarin as between 1810 and 1815. From the fact that in 1830 the village of Monroe on the St. Johns River in Florida changed its name to Mandarin, Ziegler and Wolfe (1961) concluded that this fruit must have been introduced into the United States about 1825. The fates of that introduction and of another known to have been made in 1838 are obscure. The first known successful introduction is said to have been made by the Italian consul at New Orleans between 1840 and 1850 and consisted of the Mediterranean mandarin, which came to be known as Willowleaf in this country (sometimes erroneously called China).

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- If you have a perplexing postharvest question that you'd like answered, please send it to 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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