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Director's Note

January is upon us and we are all in the midst of new beginnings. We are again offering our core Postharvest Workshops; the spring Fruit Ripening & Ethylene Management Workshop (March 31-April 1; the summer Postharvest Technology of Horticultural Crops Short Course (one- and two-week options, June 15-19 or June 15-26); and our fall Fresh Cut Workshop (September 22-24). We are also planning a new Emerging Technologies Workshop for 2020; more on that in an upcoming issue.

Registrations are now open for the March and June courses. Be sure to take advantage of the Early Bird discounted registrations for the Fruit Ripening and Ethylene Management Workshop until the end of January!

The Postharvest Technology Center is currently recruiting for an Executive Director. We are looking for a creative individual with great project management and communications skills. See details below to apply.



*Interim Director,
Beth Mitcham*

New Postharvest Books Available

Preventing Food Losses and Waste to Achieve Food Security and Sustainability, to be published by Burleigh Dodds Science Publishing in March 2020 <https://shop.bdspublishing.com/store/bds/detail/workgroup/3-190-83433>

Postharvest Physiology and Biochemistry of Fruits and Vegetables, published by Woodhead Publishing in 2019. <https://www.elsevier.com/books/postharvest-physiology-and-biochemistry-of-fruits-and-vegetables/yahia/978-0-12-813278-4>

Postharvest Technology of Perishable Horticultural Commodities, published by Woodhead Publishing in 2019. <https://www.elsevier.com/books/postharvest-technology-of-perishable-horticultural-commodities/yahia/978-0-12-813276-0>

News from the Postharvest Education Foundation

The Postharvest Education Foundation (PEF), recently announced the winner of the [2019 Kader Award in Postharvest Training](#), Wilberforce and Irene Muyomba (Africa Reachout Foundation, Uganda) to honor their wonderful accomplishments in working with local farmers and organizations to design new Postharvest Training and Services Centers, and for training women's groups in food processing and value addition for fruits and vegetables.

The PEF also announced the launch of their book project titled: *100 under \$100: Tools for Reducing Postharvest Losses*, authored by Betsy Teutsch. This book is full of illustrations of improved postharvest practices, tools and technologies, hotlinks to resources and stories of how people including some of the PEF graduates are working in their home countries to reduce food losses. The first

version of the book was disseminated as a free pdf document, and an Amazon.com Kindle ebook and print on demand edition are now available as well.

100 under \$100: Tools for Reducing Postharvest Losses (2019) Author: Betsy Teutsch - Technical Editor: Lisa Kitinoja

Kindle eBook \$3.99 <https://www.amazon.com/dp/B07TP3TWF1>

PEF Book (pdf) Free to download. http://postharvest.org/100_under_100.aspx

To purchase a print copy of the book (\$39.99): <https://www.amazon.com/dp/1089534183>

Postharvest Education at UC Davis

Fruit Ripening & Ethylene Management Workshop March 31-April 1
Early Bird Registration Only Available for One More Week!



Don't miss the opportunity to save on your enrollment by registering before January 31, 2020!

[Enroll Here!](#)

This workshop focuses on how to increase profits by reducing losses at the receiving end, and delivering ready-to-eat, delicious fruits and fruit-vegetables to the consumer. Topics will include ripening facilities and equipment, maturity and quality relationships, biology of ethylene production, sensory quality, temperature management, retail handling, and phythological disorders. Demonstrations of physical and sensory quality and environmental measurements included. Please visit the [website](#) for more information.

Registration is Open for June Postharvest Technology Short Course!

This course is a one or two-week intensive study of the biology and current technologies used for handling fruits, nuts, vegetables and ornamentals in California. It is designed for research and extension workers, quality control personnel in the produce industry, and business, government or academic professionals interested in current advances in the postharvest technology of horticultural crops..Week two is an optional tour of postharvest operations in California. Please visit the [website](#) for more information.

[Enroll Here!](#)

Scholarship Available for Postharvest Technology of Horticultural Crops Short Course

Once again, through support from the Leonard and Marsaille Morris Trust, we are able to offer a full scholarship for the Postharvest Technology of Horticultural Crops Short Course in 2020. The goal of the scholarship is to provide an opportunity for

an individual from a emerging-economy country, pursuing a career in horticultural science who otherwise would not have the opportunity to participate in postharvest training in a developed country and who will take the postharvest biology and technology knowledge gained back to their home country to benefit others in the region.

Interested individuals who meet the criteria described above should apply through [this application](#) no later than 11:59 p.m. (PST) on February 7, 2020.

The selected recipient will only be responsible for air travel to Sacramento or San Francisco, personal expenses, passport, travel visa, and other related costs. Course fees, on-the ground transportation in the U.S., lodging, and a food allowance will be provided as part of the scholarship. Applications will be reviewed by a panel of postharvest specialists. The selected recipient will be notified no later than February 28, 2020; likely before.

On Our Website

Stay up-to-date with the Postharvest Technology Center by joining our [LinkedIn Group](#).



New Publications on our Website

Fangling Jiang, Alfonso Lopez, Shinjae Jeon, Sergio Tonetto de Freitas, Qinghui Yu, Zhen Wu, John M. Labavitch, Shengke Tian, Ann L. T. Powell and Elizabeth Mitcham. [Disassembly of the fruit cell wall by the ripening-associated polygalacturonase and expansin influences tomato cracking](#). Horticulture Research (2019) 6:17. DOI 10.1038/s41438-018-0105-3

Ahmed Rady , Daniel Guyer , William Kirk and Irwin R Donis-González. [Prediction of the leaf primordia of potato tubers using sensor fusion and wavelength selection](#). J. Imaging 2019, 5, 10; doi:10.3390/jimaging5010010

Postharvest Job Opportunities



Executive Director, Postharvest Technology Center

Under direction, serve as Executive Director for the Postharvest Technology Center (PTC). The [Academic Coordinator](#) will provide leadership for researching content for, updating and maintaining the PTC web site, coordinate PTC outreach and extension programs including the Produce Professional Certificate Program, and manage short courses and workshops. Development of additional short courses is expected, as opportunities arise. The Academic Coordinator also oversees financial stewardship and budget forecasting, with assistance from a Department of Plant Sciences Financial Analyst. This person will interact with diverse faculty, staff, farm advisors, and external stakeholders of the PTC to manage and foster relationships, secure grants and coordinate applied research in postharvest physiology and technology.

Hazel Technologies

The [Agricultural Tech EU Sales Representative](#) position at Hazel Technologies' London office will be responsible for customer relationship management and business development for our growing customer base in either the Southern Europe or Northern Europe and South African territories. We are seeking dynamic, multilingual candidates with several years of experience in B2B agricultural or agrichemical sales.



Research Highlights

Petrasch, S., Knapp, S. J., Van Kan, J. A., and Blanco-Ulate, B. (2019). [Grey mould of strawberry, a devastating disease caused by the ubiquitous necrotrophic fungal pathogen Botrytis cinerea](#). Molecular Plant Pathology 20:877-892.

In this comprehensive review, the authors examine available research on horticultural management, chemical and biological control of the Botrytis pathogen in the field and postharvest storage, and discuss their relevance for integrative disease management. They also identify and propose approaches for increasing resistance to Botrytis in strawberry by tapping into natural genetic variation and manipulating host factors via genetic engineering and genome editing.

Shen, X., Sheng, L., Gao, Sh., Hanrahan, I., Suslow, T. V., & Zhu, M. J. (2019). [Enhanced efficacy of peroxyacetic acid against Listeria monocytogenes on fresh apples at elevated temperature](#). Frontiers in Microbiology 10 1-9.

Peroxyacetic acid (PAA) is the most commonly used antimicrobial in spray bar antimicrobial treatment during fresh apple packing and processing. This study evaluated the antimicrobial activity of PAA against *L. monocytogenes* on fresh apples and further examined practical parameters impacting its efficacy. An 80 ppm PAA treatment, at 30-s or 2-min exposure, reduced *L. monocytogenes* on fresh apples by ~1.3 or 1.7 Log₁₀ CFU/apple, respectively. The anti-*Listeria* efficacy of PAA was not affected by the water hardness and pH of PAA solution, while it improved dramatically (2.2–2.4 Log₁₀ CFU/apple) when applied at elevated temperature (43–46°C). The authors conclude that PAA treatment at 43–46°C can provide a vital method to improve antimicrobial efficacy against both *L. monocytogenes* and indigenous microbiota on fresh apples.

Ortiz, C. M., Vicente, A. R., Fields, R. P., Grillo, F., Labavitch, J. M., Donis-Gonzalez, I., & Crisosto, C. H. (2019). Walnut (*Juglans regia* L.) kernel postharvest deterioration as affected by pellicle integrity, cultivar and oxygen concentration. *Postharvest Biology and Technology* 156.

The role of pellicle and low-oxygen storage on kernel consumer quality was studied. Shelling caused pellicle disruption, loss of phenolic antioxidants, and accelerated kernel browning. Walnut oil degradation was also favored by pellicle damage occurring during shelling. Low oxygen tests showed that ‘Howard’ and ‘Chandler’ kernels will benefit from retail packaging with oxygen concentrations equal to or lower than 3% during warm retail display.

Spang, E. S., Moreno, L. C., Pace, S. A., Achmon, Y., Donis-Gonzalez, I., Gosliner, W. A., ... & Tomich, T. P. (2019). Food Loss and Waste: Measurement, Drivers, and Solutions. *Annual Review of Environment and Resources* 44:117-156.

The scale and impact of food loss and waste (FLW) has attracted significant interest across sectors, leading to a relatively recent proliferation of publications. This article synthesizes existing knowledge in from the literature with a focus on FLW measurement, drivers, and solutions. Key takeaways include 1) Existing definitions of FLW are inconsistent and incomplete, 2) significant data gaps remain (by food type, stage of supply chain, and region, especially for developing countries), 3) FLW solutions focus more on proximate causes rather than larger systemic drivers, and 4) effective responses to FLW will require complementary approaches and robust evaluation.

Postharvest Calendar

- March 9-10, 2020. Global Forum for Innovations in Agriculture Abu Dhabi 2020, Abu Dhabi, UAE
- March 31-April 1, 2020. Fruit Ripening & Ethylene Management Workshop. Davis, CA
- June 15-26, 2020. Postharvest Technology of Horticultural Crops Short Course. Davis, CA
- September 22-24, 2020. Fresh-cut Products: Maintaining Safety and Quality Workshop. Davis, CA
- November 9-13, 2020. 9th ISHS International Postharvest Symposium. Rotorua, New Zealand

Ask the Produce Docs



Q. Does climacteric produce stop ripening after it is cut? One of our suppliers sends us under ripe cut fruit sometimes. (B.S.)

A. Since cut fruit are held at low temperatures, further ripening is retarded. However, there may be some softening and other changes but these will simply occur more slowly than they would during the ripening process at warmer temperatures.

Generally we consider that fruit have to be “near eating ripe” when cut and that there are few changes afterwards in the fresh-cut product. Therefore you should have some specifications regarding the stage of ripeness you want from your supplier. Usually this is based on a firmness measurement.

Please note that there can be some variation on the specific requirements depending upon the particular product.

Marita Cantwell

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.

Frequency of Distribution. This publication is produced regularly, or as special issues by the UC Postharvest Technology Center.

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