



# NOVEMBER 2022

## NEWSLETTER



*Postharvest news you can always use.*

### DIRECTOR'S NOTE

After attending the California Agricultural Robotics and Technology Forum ([FIRA 2022](#)) in Fresno, Calif., aka the Raisin Capital of the World, I'm eager to share what I've learned.

This info-packed forum was co-organized by the University of California Agriculture and Natural Resources ([UC ANR](#)), the Global Organization for Agricultural Robotics ([GOFAR](#)), [Western Growers](#), [Fresno-Merced Future of Food Innovation](#), [Fresno State](#) and [UC Merced](#).

There was no shortage of discussion on the pressing issues of food production, labor availability, autonomous farming and agricultural robotics, and the economics of scale. It was great to network among and be surrounded by 1,200-plus attendees, including farmers, technology manufacturers, extensionists, students, and scientists. We were treated to engaging research presentations, roundtable discussions, and, most notably, an entire day of demonstrations in the field! I confess, I had fun!

At times, some of the proposed solutions seemed completely fictional. But then again, our imagined future has always been a fountain of creative possibilities, often portrayed and visualized in fictional terms.



Beth Mitcham  
Director



Irwin R Donis-González  
Associate Director

Some of the technological innovations on display had recently been explored and presented in-depth at the UC Postharvest Technology Center's [Emerging Technologies: Addressing Grand Challenges in the Produce Industry](#) workshop held at UC Davis just six months ago. I was excited to see in-action the autonomous weeder developed by [FarmWise](#), a presenter at our workshop. The autonomous weeder uses state-of-the-art technology to perform weeding in leafy-green vegetables and other crops. As we learned during our own workshop, autonomous weeders can help increase food production efficiency and augment human safety and ergonomics during food production. I think it goes without saying that robotics and automation present an attractive opportunity to those who have been hesitant to get involved in agriculture. These emerging technologies just might be the key to ushering in a new generation of farmers and technology developers.

Although the forum mostly focused on preharvest technological applications, I'm hopeful that in the future it will broaden its scope to include postharvest technological solutions, such as genetic improvements, ripening management, automation in processing and storage facilities, and monitoring of in-transit conditions affecting the quality and safety of fresh fruits and vegetables.

Keep your eyes open as we will be leading efforts in continuing to develop technologies applicable in postharvest, and I'm optimistic that all of you will be part of this journey.

Irwin

*P.S. Please take a moment to complete our survey below on how we can improve our educational offerings. We'd love to hear from you!*



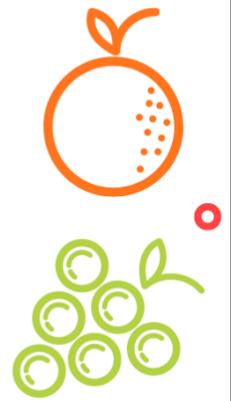
FarmWise's  
autonomous weeder

Irwin at the FIRA 2022  
field demonstration.



# POSTHARVEST EDUCATION

AT UC DAVIS & BEYOND



## PRODUCE HANDLING EDUCATION SURVEY

PLEASE TAKE OUR  
7-QUESTION SURVEY



WE WANT  
YOUR FEEDBACK

The UC Postharvest Technology Center would like your feedback on how we can improve our yearly educational offerings, including our Postharvest Technology of Horticultural Crops Short Course, Fresh-cut Products: Maintaining Quality & Safety Workshop, and Fruit Ripening & Ethylene Management Workshop. Please take a moment to complete our brief survey today. Thank you!

**March 7-8, 2023**

**FRUIT RIPENING &  
ETHYLENE MANAGEMENT**

*Hybrid Workshop*

Registrations  
opening in early  
December!



# POSTHARVEST TECHNOLOGY OF HORTICULTURAL CROPS

*Short Course*

Registrations  
opening in  
early 2023!

CLASSROOM LEARNING

**June 19-23**

FACILITY TOURS

**June 26-30**



## RESEARCH CORNER



### Storage Temperature, Relative Humidity, and Time Effects on the Organoleptic Profile of Walnut Kernels

*Authors: Elizabeth Mitcham, Claire Adkison, Nico Lingga & Veronique Bikoba*

*Published in [Journal of the American Society for Horticultural Science](#)*

Four cultivars of English walnut were evaluated by a trained taste panel after 6 and 12 months of storage at 41, 59 or 75°F, (5, 15 or 25°C) and at 40%, 60% or 80% relative humidity within each temperature. Temperature was found to significantly impact walnut oil oxidation and perceived nut rancidity, whereas storage at high relative humidity affected walnut texture and accelerated quality loss. The effect of relative humidity was more pronounced at lower temperatures, leading to increased hydrolytic rancidity. Free fatty acids were not correlated to the rancid sensory attribute but were significantly correlated to the bitter attribute. Walnuts stored at 41°F with 40% or 60% relative humidity were associated with the sweet sensory attribute and light color. Kernel darkening was associated with bitter and rancid sensory attributes, but a causal relationship is unknown. Sensory quality of walnuts is complex and requires further study to establish thresholds for chemical indices of walnut quality loss based on organoleptic perception, but it is clear that storage temperature has a strong influence on post-storage quality, followed by relative humidity.

Read the  
full paper





# SOCIAL MEDIA UPDATES



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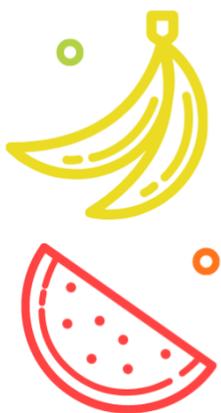
Kitchn, a food news website, recently turned to Drs. Beth Mitcham and Irwin R. Donis-Gonzalez for tips on how to choose, wash and store grapes for maximum freshness and shelf-life. Find our post related to this article on our social media pages, linked above, or [read the full article](#).

*Here's an excerpt from the article "How to Properly Store Grapes So They Last" by Sarah Beling, which appeared in Kitchn on October 6, 2022.*

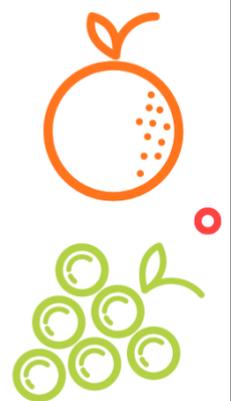
"While experts advise us to purchase and store grapes that are still on the vine, if you do purchase loose berries in convenience clamshell packaging, make sure to get them into the refrigerator quickly and plan on eating them sooner, says Dr. Elizabeth Mitcham, director at the UC Davis Postharvest Technology Center. 'The grapes off the vine will have a shorter shelf life due to the small injuries from removing the stems,' she says."



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# ASK THE PRODUCE DOCS



## QUESTION

My company is dedicated to tomato production and wants to acquire equipment that can measure the firmness of the tomato. Currently, we use a manual texturometer, but we're interested in equipment that doesn't require human intervention. Can you share information and cost of using durometers to measure tomato firmness?

## ANSWER

Tomato firmness is challenging to measure because of the internal structure of the fruit. You can get different values when you press on the surface if you are over a locule opening or over the locule wall. In a whole fruit, you cannot know where you are measuring. For this reason, two approaches have been taken depending on your objectives in measuring firmness:

1. You can use a flat plate to compress the entire tomato fruit a few millimeters and measure the resistance to compression. The plate should be bigger than the diameter of the fruit.
2. If you are more interested in the changes in firmness of the tomato pericarp (the outer part of the fruit), you can remove a piece of pericarp tissue (a cork borer works well for this) and then use a rounded probe ~2/3 the diameter of the pericarp disc to compress the inner side of the pericarp 1-2 mm. Again, you will measure the resistance to compression.

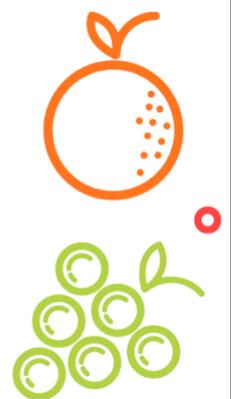
Both measurements can be done with a Texture Analyzer, although this is an expensive piece of equipment. While I have not tried it, I think you may be able to use the durometer to measure the inside of the pericarp disc in #2 above, and this should provide a reasonably accurate measurement. Make sure your disc is at least 1/3 bigger than the durometer probe. You will likely need to create your own scale for firm to soft. The durometer readings can be influenced by the user and some training is required to “calibrate” how the probe is pressed onto the flesh.



Visit our [Produce Fact Sheets](#) for more information about handling a range of produce types!



# ADDITIONAL INFORMATION



**Information.** For more information, please [visit our website](#) or [email us](#).

**Postharvest Questions.** Please send your postharvest questions to [postharvest@ucdavis.edu](mailto:postharvest@ucdavis.edu), and we'll see if one of our specialists can help! (Our answers to "Ask the Produce Docs" questions represent the best understanding of the current state of knowledge at the time of the latest update and does not represent an exhaustive review of all research results. Answers are for guidance only. Recommendations may vary from those listed because of, but not limited to, geographical differences, cultivar differences, maturity at harvest or ripeness, growing conditions, grade and quality at harvest, temperature management practices after harvest, and use of special treatments. The UC Postharvest Technology Center and individuals answering the questions are not responsible for any losses, injury to you, any other person, or any property. Further, users agree to release the UC Postharvest Technology Center and individuals answering the questions from all claims and liability related to use of any content.)

**Archived Items.** Please visit our datastore of all previous "[Ask the Produce Docs](#)" questions and answers, and peruse [archived copies](#) of our PDF e-newsletters.

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**Editorial Review.** Beth Mitcham

**Writing & Coordinating Publishers.** Beth Mitcham, Angela J. Bass, Irwin R. Donis-Gonzalez, Pam Devine

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