

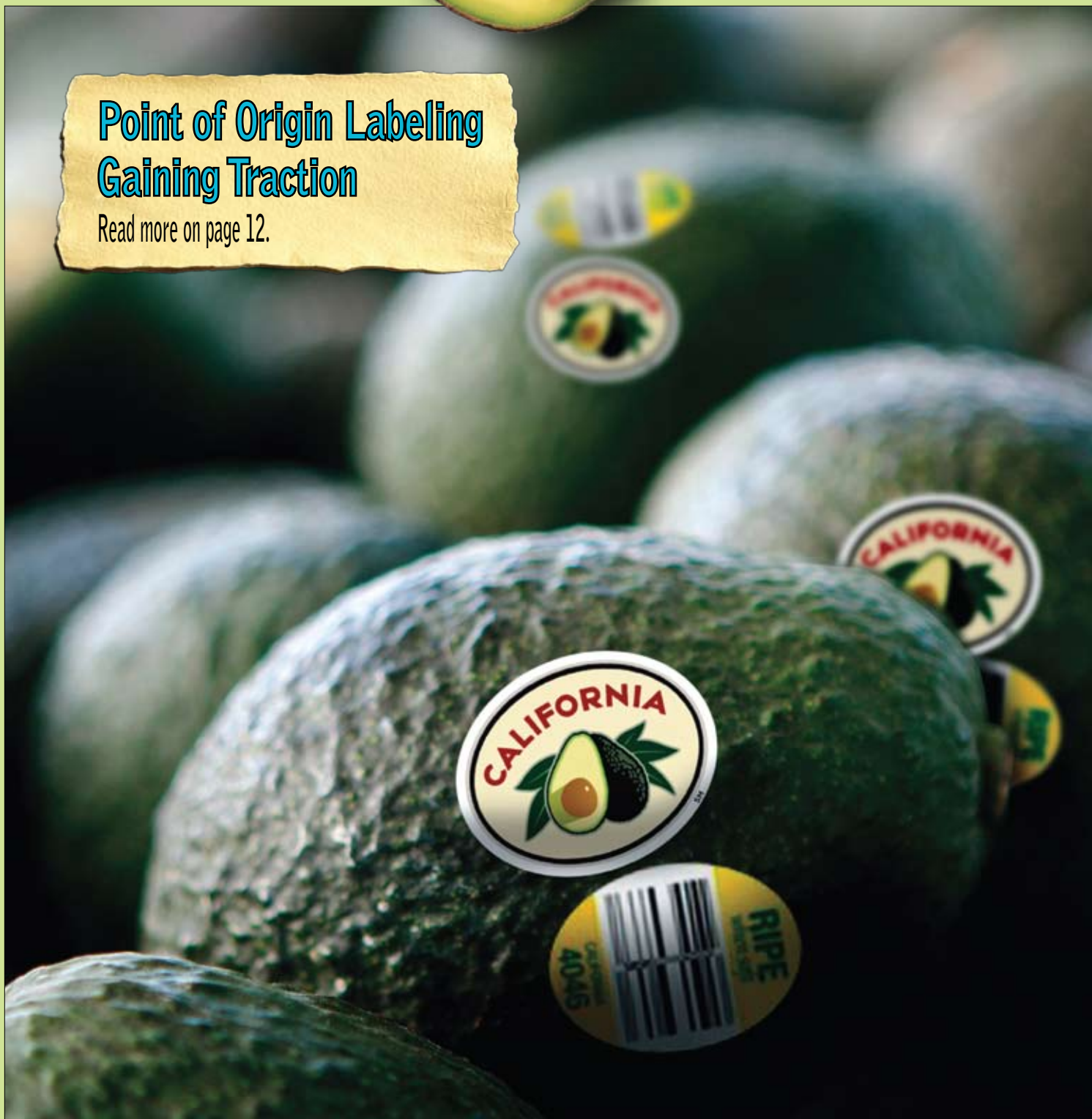
Summer 2014

From the **Grove**

The Latest News from the California Avocado Industry

Point of Origin Labeling Gaining Traction

Read more on page 12.





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Avocado leafroller

Orange tortrix

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Grower Profile

David Ross
Moorpark, CA

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From the Grove

Volume 4
Number 2

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Summer 2014

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Avocado Breeding Program At a Crossroad



Tom Bellamore

The California avocado industry has had a long history of involvement with the University of California aimed at developing rootstocks and cultivars that meet the industry's needs. Plant breeding, by nature, is time consuming and costly. Traditional breeding programs rely on thousands of plantings from which selections are made for specific traits, and screened material must then be evaluated with replicated field trials to determine if a promising scion or rootstock will perform as required.

Given the development time for an avocado tree to progress from seedling to one that bears fruit, the entire process may take years if not decades. Marker-assisted selection — a technique that utilizes molecular markers to identify favorable traits at an early stage of tree development — potentially accelerates the selection process, but trials must still be conducted under field conditions before new plant material is ready for release.

In today's environment, the California Avocado Commission (CAC) is challenged to deliver the most it can for every grower assessment dollar collected. It may seem that a \$16 million operating budget should more than provide for a robust production research effort, sustained advocacy on an endless list of issues, and enough marketing muscle

to keep our product competitively positioned and growers profitable, but it is just not the case. Some would argue that the entire budget, if spent solely on marketing, would still fall short of what is needed to keep our "premium" edge as Mexico's advertising and promotion spend for the United States approaches \$30 million annually. Others would opine that we cannot risk inaction when it comes to the polyphagous shot hole borer, lest we find ourselves with no fruit to market if the pest takes hold in commercial avocado orchards. The middle position (which is often where the CAC Board finds itself) calls for a rational allocation of resources across functions, marketing and non-marketing alike, to protect and advance the industry's interests without burdensome increases in the assessment rate.

What this demands of the industry's plant breeding program, then, is simple: focused research and — where possible — shortened time horizons. Water availability and water quality count among the largest threats to California avocado growers and the problem is no longer limited by geography. Southern groves, fed with imported water from the salinity-laden Colorado River have long been under siege. Now, their ranks are joined by northern growers who face water supply challenges because

of the protracted drought and those whose wells are producing ever-increasing loads of total dissolved solids. What both groups of growers need is a rootstock that is drought and salinity tolerant, to help trees adapt to environmental stresses that are becoming more commonplace across the growing region each year. And they cannot wait long, if at all.

The current scrutiny that is being placed on the industry's plant breeding program by the Commission board of directors and its production research committee is, in my view, warranted. It is born of need and urgency rather than criticism of efforts past. The industry is fortunate to have some of the foremost avocado researchers in the world at the University of California, Riverside (UCR) working on its most difficult challenges. We need these individuals and we need some fresh thinking about how to fast-track our program while squeezing the most efficiency out of finite resources and constrained budgets.

All options should be on the table, from the conventional to the unthinkable. Some of these options, which could be as dramatic as privatization of all or a portion of the plant breeding program, may require shifting risk to the growers in order to shorten delivery times for new, and less-than-fully-tested material.



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Alternate/Jerome Stehly

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Alternate/Kellen Newhouse

Member/Ohannes Karaoghlanian
Alternate/Thomas Caudill

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Alternate/Vacant Seat

Member/Gene Carbone
Alternate/Ron Araiza

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Andria Pontello

To contact a CAC representative, please visit:
CaliforniaAvocadoGrowers.com/Commission/your-representatives

Others — such as identifying every potential rootstock regardless of who owns it and where it is located — may require significant outreach and networking, collection of performance data and, ultimately, international licensing agreements and the movement of plant material through quarantine to California. Why not start with a comprehensive review of data available on existing rootstocks already in the ground at university facilities, which have already been screened for root rot tolerance?

In the end, the best way forward may prove to be a combination approach that utilizes laboratory testing, genomics, and semi-commercial field trials to increase the likelihood of success and get rootstocks into the hands of growers as quickly as possible.

UCR is presently conducting a

faculty search for an assistant professor in the Department of Plant Pathology and Microbiology. The focus of the position is resistance to biotic stress in subtropical crops. There is no question that additional talent at the university would be welcome by the California avocado industry. The Commission, too, will be bringing new scientific expertise aboard, as our current Research Project Manager Dr. Tim Spann is moving to California State University-Fresno in late July. These changes should be viewed as opportunities.

As we stand at the crossroad and consider the future of the avocado breeding program, the industry should embrace all comers, harnessing their newfound enthusiasm for avocados. The diversity of ideas that is likely to emerge may be just what the doctor ordered. 🥑

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Ed McFadden

Thoughts from the Chairman's Grove - Communication/Cooperation

Somehow the California Avocado Commission's (CAC) *From the Grove* magazine seems like an appropriate place for this Chairman's column. I manage an avocado grove and my wife and I live in our own grove where we raised our now-grown children. I was raised in a farm house in a grove my mother and father helped my grandparents develop. I am like many of the readers of CAC's seasonal magazine — literally "from the grove".

The global avocado grove is both shrinking and expanding. Shrinking in terms of our avocado world becoming smaller through improved communication and cooperation between the avocado growing regions around the world. Expanding in the sense that more of our favorite California Native — the Hass avocado — is being grown worldwide and more people are beginning to understand the unique health and eating qualities of avocados that we, who are "from the grove," have understood for generations.

World-wide cooperation among growers and marketers of our Hass



avocados has come a long way in recent years. Hass Avocado Board (HAB) meetings were once fairly intense. Now, while there is still spirited debate, I feel more of a spirit of cooperative competition when I attend meetings as the CAC ex-officio member.

As a former basketball player, I am reminded of the rivalry between Erwin "Magic" Johnson and Larry Bird. Unfortunately using those two basketball greats as examples here

also dates me. Both were skilled and highly competitive players who came to respect each other, even as they did everything they could to win games for their team. The respect and competition made the sport of basketball better, more popular and expanded the love of the game in the United States and worldwide.

I look at the U.S. avocado market in much the same way. Of course we Californians are proud of our premium product. Our competitors feel the same way. Of course we also have an advantage that no one else can claim: our groves sit right here in the middle of the market of choice for the world's best avocado producers. The important point is that even though we are competitors, we are also working together to build the U.S. market, something that will certainly benefit all California growers.

I have felt more of the same spirit at our own California Avocado Commission Board and annual meetings. Of course we are all individual growers working to improve our own bottom line. I do think that now more of us understand that we can

help ourselves by working together to improve and strengthen our California industry and brand while at the same time working with our competition around the world to grow and improve the U.S. and other markets.

Back to examples of cooperation in a shrinking world. For the past several years HAB Chair Jamie Johnson has hosted a dinner the night prior to the HAB meetings where Board members and staff gather to share a meal in a social setting. I can't tell you how valuable it is to share a drink, a meal and tall tales with the other "teams". Recently, the Mexican Department of Agriculture urged its U.S. counterpart to immediately expand the avocado export program, allowing fruit from any region in Mexico to enter the market. CAC President Tom Bellamore worked behind the scenes, teaming up with the Mexican growers' association APEAM to ensure that compliance with the necessary phytosanitary requirements occurs in a staged and orderly manner. Neither California nor its Mexican counterparts want the introduction of an insect pest that would lead to market instability. Meanwhile, we both need to spend time and money to increase U.S. consumption as volume gradually increases in order to preserve market value.

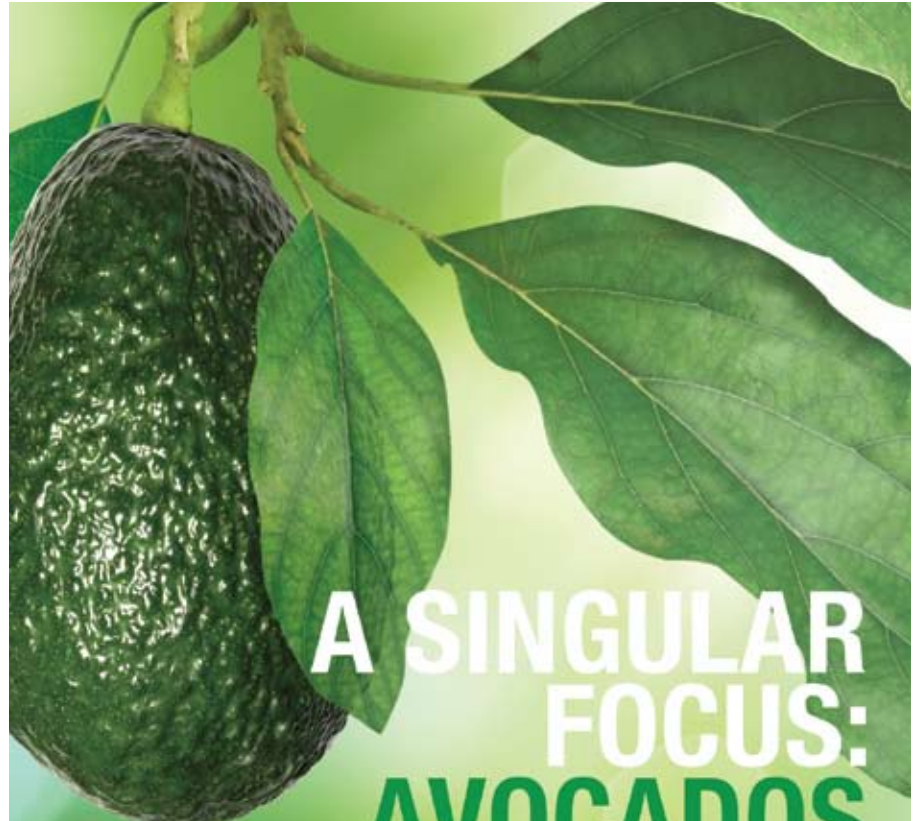
I still worry about importing pests and diseases into our groves. We must hold our government responsible for keeping these threats out of our state and country.

At the same time we California growers must recognize that having a year-round supply of high quality fruit available in the U.S. market has greatly improved the market for all of us. Does everyone still remember 1993? A 600 million pound California crop saturated the market and brought us average returns of 17 cents per pound. Nearly three times that volume will be consumed in the United States this season with much,

much better results.

It is time for me to stop writing and get back to my grove. We are still reeling from the dual triple digit May heat waves and winds but I'm seeing more late set sticking to the trees in blocks where I had expected to find everything on the ground. El

Niño is starting to look a little more solid for next winter — do we have some real rain on tap for next winter? Let's work together to make this "off" season work and get our trees ready for what is hopefully an "on" season on the way. 🥑



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By April Aymami
Industry Affairs Manager

2014 CAC General Election

In October 2014, the California Avocado Commission (CAC) will conduct its regularly scheduled annual election to fill available seats on the Commission's Board of Directors.

The CAC Board is comprised of 29 individuals serving as producers, handlers and public members. The state's avocado growing region is broken down into five districts, with two producer members and two alternate producer members elected to serve each district for a total of 10 growers on the Board. In addition, there are four handler members, four alternate handler members, along with one public member. Each seat on the Board serves a two-year term, unless the seat is affected by redistricting, with expiring terms alternating so that there is continuity from one Board to the next. This year the Commission will have one member and one alternate seat in each of the

five districts available. In addition, two handler member and two alternate handler positions are available.

Included is a summary of the seats that will be filled in the coming 2014 election, along with the names of incumbent Board members who presently hold those seats. Also in-

cluded is the 2014 Election Schedule indicating dates of importance for those interested in serving on the CAC Board. Should you have any questions regarding the election process, or serving as a commissioner, please contact April Aymami at (949) 341-1955 or aaymami@avocado.org.

SUMMARY OF OPEN SEATS*

District	Member	Alternate
1	Shane Tucker	Jerome Stehly
2	Ohannes Karaoghlanian	Thomas Caudill
3	Doug O'Hara	Michael Lanni
4	Art Bliss	Larry Rose
5	Bradley Miles	Jim Swoboda
Handler	Egidio "Gene" Carbone	Ron Araiza
Handler	Gary Caloroso	Vacant Seat

* Names shown are incumbents presently holding producer/handler seats

2014 ELECTION SCHEDULE

July 14	Election announcement / self-nomination notice sent to all producers and handlers
August 25	Deadline for receipt of signed nomination petitions, candidate disclosure statements and affidavits, and requests for voter access mailings at CAC
September 2	Deadline for CAC receipt of voter access mailings
September 22	CAC mails ballots to producers and handlers
October 20	Deadline for receipt of ballots by CDFA
November 7	CDFA advises CAC staff of election results
November 13	CDFA announces election results to CAC Board and seats new Board members and alternates



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Matt Hand, SoCal Entomology & Grower

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Ralph Foster, 2013 Winter From the Grove: Grower Profile

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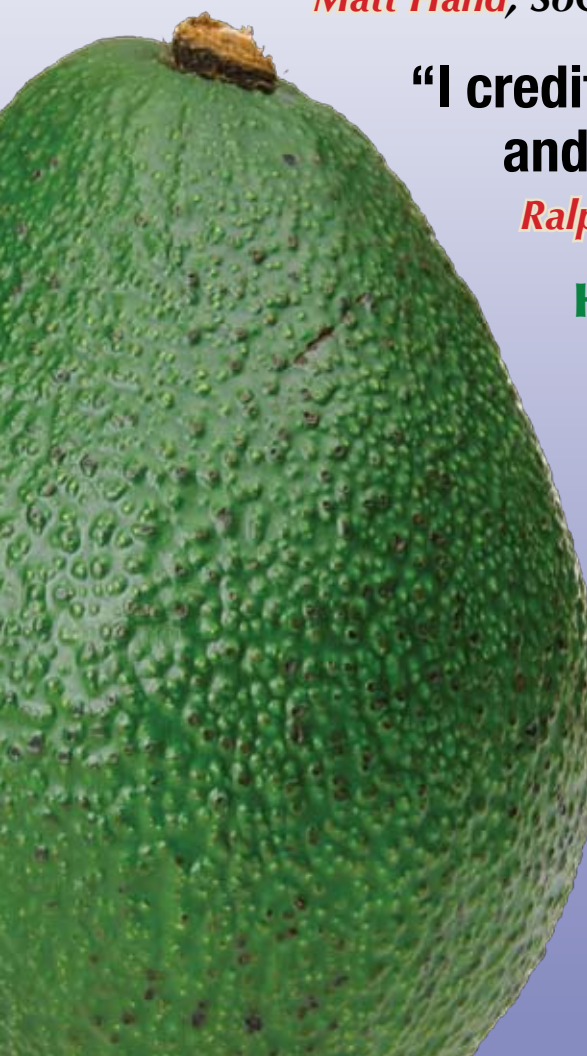
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2014 Mid-Season Crop Update

The California Avocado Commission (CAC) would like to thank all of the growers who participated in the recently concluded Crop Estimate Survey. Survey forms were mailed out in mid-April with a return date of May 7, 2014. This year's response represented 49 percent of the bearing California avocado acreage, and is on par with

the Crop Estimating Team's preferred response rate. Using various statistical analyses to evaluate information gathered through the crop survey, satellite imagery and acreage inventory results, the Crop Estimating Team has estimated the 2013-14 California avocado crop to be coming in at 315.7 million pounds, about 10 million pounds less than the initial

pre-season estimate of 325 million pounds. Despite the expected crop shortfall, market performance to date indicates that CAC should still meet, if not exceed, revenue projections for the 2013-14 fiscal year. Below, are details of the mid-season crop estimate results including variety breakdowns and production by county. 🥑



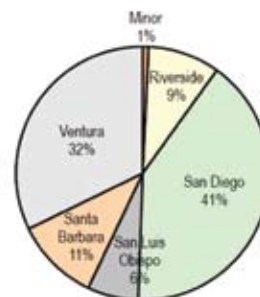
California Avocado 2013/14 Mid-Season Crop Estimate Update

Variety	Bearing Acres	Estimated Yield		Response %
		Lbs/Acre	Lbs (MM)	
Hass	54,429	5,555	302.4	49%
Lamb-Hass	1,801	4,732	8.5	40%
Other	989	4,799	4.8	41%
Total	57,219	5,516	315.7	49%

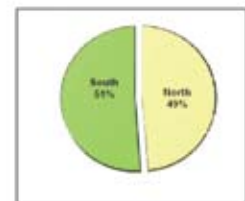
County	Hass Only			All Varieties		
	Bearing Acres	Estimated Yield		Bearing Acres	Estimated Yield	
		Lbs Per Acre	Lbs (MM)		Lbs Per Acre	Lbs (MM)
San Diego	19,784	6,018	119.0	21,082	5,956	125.6
Riverside	6,169	4,553	28.1	6,264	4,537	28.4
Orange	1,198	5,660	6.8	1,250	5,435	6.8
Ventura	16,621	5,647	93.9	17,692	5,623	99.5
Santa Barbara	5,778	5,690	32.9	5,893	5,623	33.1
San Luis Obispo	4,268	4,621	19.7	4,330	4,611	20.0
San Joaquin	143	1,607	0.2	191	1,203	0.2
Other	468	3,773	1.8	517	3,983	2.1

Estimated yields are on tree forecasts and do not attempt to adjust for weather factors or project carry-out. Bearing acres include producing and topped/stumped trees four years or older. ACE Statistics: 05/13/14

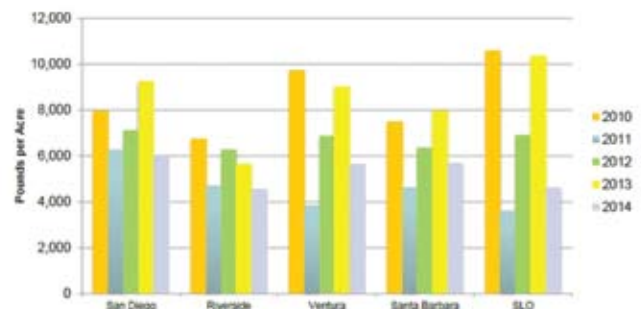
Crop Distribution by County



2013-2014 Crop



Last Five Years Estimated Hass Yield By County

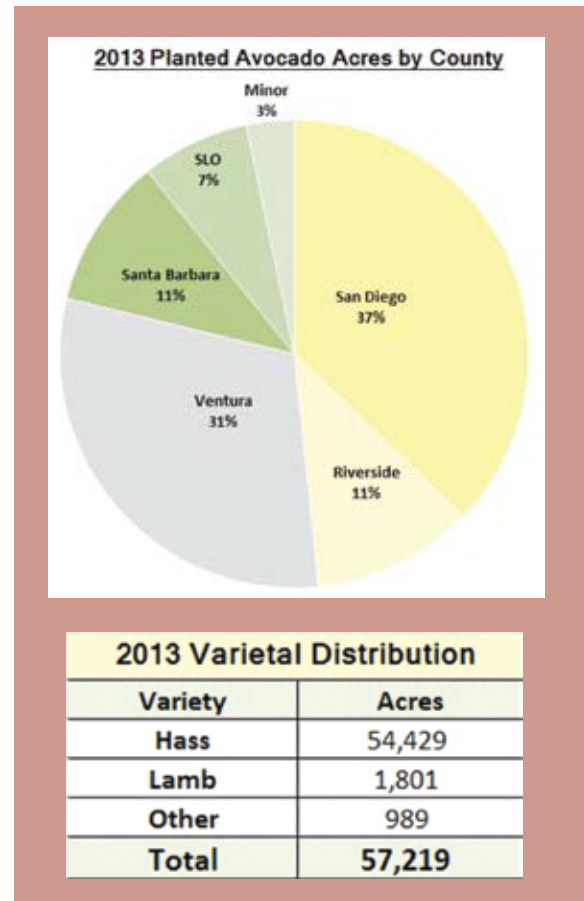


2013 California Avocado Acreage Inventory Update

The California Avocado Commission's (CAC) crop estimating team, in conjunction with GeoSpatial Partners, LLC, uses the latest in remote sensing techniques to assess avocado acreage in production. As technology continues to advance, refinements in our third generation of remote sensing techniques were applied to satellite imagery collected in April and May 2013. The imagery processing techniques include:

- Segmentation into homogenous polygons
- Retention of tree crop polygons
- Calculation of average crop canopy moisture and vegetation indices
- Analysis of change maps from previous inventories
- Classification of avocado groves into categories including producing, topped/stumped, and new/young

Aerial imagery (for a real-world view) and satellite imagery (for spectral and temporal data) are integrated into previously classified avocado acreage and analyzed for current condition for five primary avocado growing counties: San Diego, Riverside, Ventura, Santa Barbara, and San Luis Obispo. Other minor counties' acreage is estimated based on ancillary data from county agricultural commissioners and our grower community. The results of the avocado acreage inventory, including the CAC crop team application of varietal break down, are below. 🥑



2013 California Avocado Acreage Inventory Summary by County

County	Producing Acres	Topped/Stumped Acres	New/Young Acres	Total Planted Acres	CAC Bearing Acres (Pro+Top)
San Diego	20,643	439	985	22,067	21,082
Riverside	6,127	137	374	6,638	6,264
Ventura	17,089	603	378	18,070	17,692
Santa Barbara	5,707	186	307	6,200	5,893
San Luis Obispo	4,214	116	89	4,419	4,330
Total 5 Counties	53,780	1,481	2,133	57,394	55,261
Total Minor Counties*				1,958	1,958
Grand Total				59,352	57,219

* Orange, Los Angeles, San Bernardino, San Joaquin Valley, Monterey

Point of Origin Labeling Gaining Traction

California Designation Getting Sticker Treatment

By Tim Linden

Going back 20 years, the idea of developing a strong connection between domestic avocados and their California point of origin has been a concept the California Avocado Commission (CAC) has embraced.

"In the 1990s when the idea of stickering fruit with PLU numbers was in the forefront, we talked about it," said Tom Bellamore, president of CAC. "And then we did so again when the U.S. Department of Agriculture began regulating country of origin labeling. When we launched the 'Hand Grown in California' campaign in 2008 it seemed only logical to try and create a visual connection between our promotional material and what the consumer would find on avocados in the display bin at retail."

But the momentum for actually labeling the fruit with a prominent "California" label failed to reach the tipping point then. The idea is no longer just idle chatter. Consumer research shows that the end users have a strong preference for California-grown fruit and it makes perfect sense to give the consumer what he or she says they are looking for. "Don't get me wrong. Some packers have been designating California on their stickers or their labels for years, but it hasn't always been done in a prominent way or in a manner that complements our messaging," Bellamore said.

This year, on the other hand, several packers have already embraced the idea and are labeling fruit with the "California" name and artwork provided by CAC that is graphically similar to CAC's recognized Hand Grown in California logo. And almost every packer is at least exploring the concept. At the time of this writing there is fruit in the marketplace with the California name prominently displayed on it.

The genesis of the tipping point, according to the CAC president, was the articulation of Vision 2025 a couple of years ago, which was the shared effort of CAC's board and management to anticipate the future challenges facing the California avocado industry and devise a path for continued profitability. Since California first started touting its point of origin, the landscape has dramatically changed. Back then it was a way to tell consumers where the avocados they were buying were coming from. Today, California makes up 20-30 percent of the volume sold in the United States, and the point of origin designation label is designed to highlight a point of differentiation.

Bellamore said the Vision 2025 plan staked out a goal of creating a "premium position" for California avocados. The product is grown much closer to the marketplace and can be in the consumer's hand at the peak of its freshness. California growers have a superior piece of fruit during their growing season and they know it costs more to produce.

"Premium positioning is essential for the long term," said Bellamore.

And most importantly, research shows the consumer agrees. In its ongoing tracking study, CAC has been asking consumers for a decade about the importance of country of origin in avocados and how they check for country of origin. The research shows that the locally grown movement has moved the needle substantially. By a factor of as much as 10 to 1, consumers, who have a preference, prefer to buy California avocados. But unfortunately, they can't always tell the origin of the avocados they buy. Though the California origination is often somewhere on a label or a package, it isn't typically prominent and consumers typically do not spend much time seeking it out when making a purchase.

Bellamore said for a variety of legitimate business reasons, packers have not made that a priority. In the first place, most packers source from many different points of origin and creating a seamless supply of avocados for their trade customers is important to them. There are also logistical and cost issues involved in adding a sticker to the fruit in the packing line or redesigning a label.

For these reasons, Bellamore said CAC has approached its label initiative from a consumer and retailer perspective. Before asking packers to make the switch, the Commission wanted to survey consumers as to their preference and conduct in-store testing to gauge its effectiveness. He said those tests proved that the idea was worthwhile and effective but he points to grower buy-in as quite possibly the key to influencing packer acceptance.

"The consumers want it, their customers want it, but may be most importantly, growers want it," Bellamore said.

It is no secret that packers compete in the marketplace for market share, but they also compete in the groves for growers' fruit. It is a highly competitive environment.

For the 2014 season, CAC was hoping to convince a



packer or two to take a small step and launch a pilot program. “We thought once that happened, the packers would be rewarded by the grower community and that is exactly what has happened. Once a couple of packers said they were willing to try, others came aboard.”

Bellamore is still characterizing this year’s effort as a pilot program because many packers are still weighing their options. There is a two label option that involves adding a prominent “California” label with CAC-similar artwork to the fruit along with the PLU barcode. Other packers are designing new barcode labels incorporating the California logo. To CAC, there is no right or wrong way. The goal is to have the California fruit with a prominent label designating that point of origin in an artful way that mirrors the messaging CAC presents to consumers and retailers in its other promotional materials.

“We know packers are going to be using up old labels so not every piece of fruit will be labeled,” Bellamore said of this season.

But acceptance has been widespread and this program is clearly moving down the path at a much faster clip than anticipated even a couple of months ago.

The CAC merchandising staff has also found wide retailer acceptance. Chris Vasconcellos, senior director of customer solutions for Lucky Stores, a division of Save Mart in Northern California, said the chain has gotten “good positive responses from our shoppers” to the avocado label. “Our customers are very loyal to California and love to see that label.”

He said that loyalty to the state, as well as embracing the

locally-grown concept, is especially noticeable in the Bay Area. “They know that it means it’s fresh and they feel safer buying it.”

Vasconcellos said the chain is currently redefining what “local” means but in general, “we like to look at fruits and vegetables that can get to our stores within 24 hours. Any product from California fits the description.”

He said Lucky will often advertise the point of origin if that point of origin is meaningful. “Right now I am working on an ad for Brentwood corn (grown in Northern California).”

He added that California avocados are definitely a distinction that means something to his customers.

Bellamore said over time CAC will try to quantify the effectiveness of the “California” label, measuring the ring at retail as well as the velocity of movement. He said it gives CAC and the California industry the opportunity to strive for premium positioning in its promotions, while allowing consumers to act upon their preferences. At the end of the day, the CAC president admits that measuring results of such a program are difficult as every year is different and many other factors influence price and movement on a daily basis.

But Bellamore sees it as a no-lose proposition. He doesn’t discount the cost of initiating the program but in the long term, he said if the label can be added without a substantial incremental cost increase, there is no downside. “Consumers want it. Retailers want it. Growers want it. It is the right thing to do for the industry’s future.” 🥑



Tour attendees assembled after a lunch showcasing California avocados in a variety of uses.

CAC Season Opener Activities

To celebrate and spread awareness about the start of this year's California avocado season, the California Avocado Commission (CAC) implemented several successful programs in April and May.

As a way to launch the season to media and consumers, CAC worked with registered dietitian (RD) partner Katie Ferraro to have her create four new, exclusive California avocado snack recipes that were all less than 100 calories per serving. These recipes showed how versatile avocados are and highlighted how they can serve as a key ingredient in snacks. The recipes were featured in a press release that was distributed nationally.

Additionally, CAC provided key influential bloggers with a delicious avocado-grove-luncheon of dishes made with fresh California avocados to inspire them to create new recipes and blog posts about the start of the season. The 15 bloggers and media received avocado shipments, which resulted in more than 50 blog and social media posts, and 500,000 impressions so far.

To further engage consumers on social media, CAC hosted three Facebook chats to help kick off the season. The CAC-hosted chats provided consumers the opportunity to interact with various California avocado key influencers including California avocado grower Doug O'Hara, RD Emily

Schiller and artisan chef partner Ivy Stark. These sessions encouraged fans to engage with each guest and ask questions about how California avocados are grown, the nutrition and health benefits and ways to incorporate California avocados into recipes at home.

Participants had the opportunity to win prizes including fresh California avocados and Chef Ivy Stark's new cookbook. This year there was a 34 percent increase in RSVPs over last year. The program led more than 2,000 people to CAC's *The Scoop* blog and had a reach of 15,260.

CAC also hosted an exclusive tour that provided a broad cross section of communicators with a more in-depth view of California avocado production from nursery through packing house. The tour was topped off with a delicious lunch of dishes featuring California avocados in a grove. Ferraro was on hand to give a live demonstration of one of her recipes and to highlight the nutritional benefits of the fruit. The attendees included consumer and trade media, foodservice operators and supermarket registered dietitians (SRDs).

Additionally, a trade press release was distributed to trade media in late April summarizing CAC's season opener activities and partnership with Katie Ferraro. The release had excellent pick up, resulting in articles in *The Packer*, *The*

Produce News, AndNowUKnow and The Shelby Report.

CAC's season opener activities have set the tone for 2014, creating momentum for the rest of the season. The activities serve to create excitement and anticipation for California avocados, and also serve to inspire consumers and media to think of California avocados as a premium product, perfect for summertime meals. 🥑



Katherine Anne Good of the popular blog "Bombay Blonde" got a kick out of picking a California avocado in the grove.



RD Katie Ferraro demonstrated how to prepare a 100-calorie snack with California avocados.



Clement Saseun, Director of Quality for DineEquity (IHOP/Applebee's), Inc. (right) learned how to pick avocados from Hayden McIntyre, son of avocado grower Scott McIntyre.



Alex Gonzalez led the group of communicators on a tour of Persea Nursery.

Commission Questions FDA's Avocado Sampling Assignment



By Ken Melban
Director, Issues Management

Trevor Newhouse, West Pak, discusses food safety practices.

Last December, the California Avocado Commission (CAC) learned “off the record” that the Food and Drug Administration (FDA) intended to conduct a Sampling Assignment Pilot Program for the following products: sprouts; domestically produced raw milk aged cheeses; and, domestic and imported whole, fresh avocados.

To put it mildly, we were stunned!

Why would FDA include fresh avocados, an inarguably low-risk product with a stellar record on food safety, with commodities that historically pose much greater risk? FDA stated the goal of the SAPP is to “fill in knowledge gaps regarding the prevalence of bacterial pathogens in specific food products and identify likely routes of contamination.”

Commission President Tom Bellamore immediately initiated high-level contact with FDA directly and through our Washington, D.C., counsel, advising the agency that CAC represents more than 95 percent of the domestic avocado industry and noting we should have been contacted by the FDA as the SAPP was being considered and developed. Bellamore also communicated concerns about the genesis of the SAPP, how it might be conducted and how results may be disclosed.

Again, without any previously reported food safety in-

cidents involving fresh whole avocado, we have been included in this SAPP. The mere knowledge that avocados are being examined by the FDA may raise possible concerns from both retailers and consumers, regardless of how unfounded. The Commission has invested millions of grower dollars to develop our highly respected and valued Hand Grown in California brand, and any unmerited fears of fresh avocado safety would likely cause disruption to the domestic avocado market resulting in potential serious financial loss.

The Commission’s frustrations were shared by APEAM, the Mexico avocado growers association, and a concerted plan was put in place to invite FDA officials to tour each respective country’s operations and learn first-hand about fresh avocado production and packing. In April, the Commission hosted 11 FDA officials for two days of grove and packing facilities tours, which followed similar tours held in

Mexico in late March.

The California tour represented a broad, cross-sample of FDA officials involved in the SAPP, including senior officials from Washington, D.C., regional supervisors and area inspectors. At the beginning of the tour, as Bellamore and I were becoming familiar with the FDA participants, we kept it very non-confrontational. But as the end of the first day drew near, the atmosphere would best be described as one in which the “gloves came off!”

We directly questioned them on issues ranging from how FDA established their commodity rankings for the assignment and their rationale of including avocados, to their sampling protocols and how they could ensure the integrity of the samples taken at retail. While they didn't provide us



FDA representatives tour an avocado grove.



Dana Thomas, Index Fresh, answers questions from participants.

with satisfactory answers in all areas, there were some positives, an example of which occurred just as we boarded the bus for the second day of the tour when they informed us that retail samples would be taken from the back of the store before the avocados had come in contact with consumers.

Ultimately, our goal was to get FDA to eliminate the avocado SAPP entirely, which had been scheduled to start this past January. While we were successful in getting it delayed, unfortunately the avocado SAPP did commence in mid-May. The SAPP calls for the collection of 1600 samples — 70 percent imported (1,120) and 30 percent domestic (480) — collected at ports of entry, distribution centers and warehouses, packinghouses, and retail and foodservice. Sample sizes (20 pieces of whole fruit) are to be tested for *Listeria monocytogenes* and *Salmonella*. We know, as a result of the

Commission's involvement, FDA is better informed on California avocado production and potential negative market implications and we expect application of their new-found knowledge. In addition, we believe FDA has an improved understanding of California avocado production which should assist them in their decision-making on the Food Safety Modernization Act.

But, as experience has taught us when dealing with governmental bureaucracies, one can only hope logic and common-sense will prevail. We will have to see how the SAPP unfolds, so for now, I leave you with the following quote from Mark Twain, “I am quite sure now that often, very often, in matters concerning religion and politics a man's reasoning powers are not above the monkeys.” My apologies to any monkeys I may have offended. 🥑



Tom Bellamore and Jerome Stehly discuss California avocado production.

California Avocado Commission Promotes Avocados for Summer Snacking

The California Avocado Commission (CAC) has launched a new snacking campaign designed to bolster avocado usage. The campaign features dozens of avocado snack ideas developed by CAC, registered dietitians (RDs) and blogger partners. Program components include retail snacking brochures, co-marketing, trade and consumer public relations, online and social media, as well as showcasing California avocado snacks at industry events.

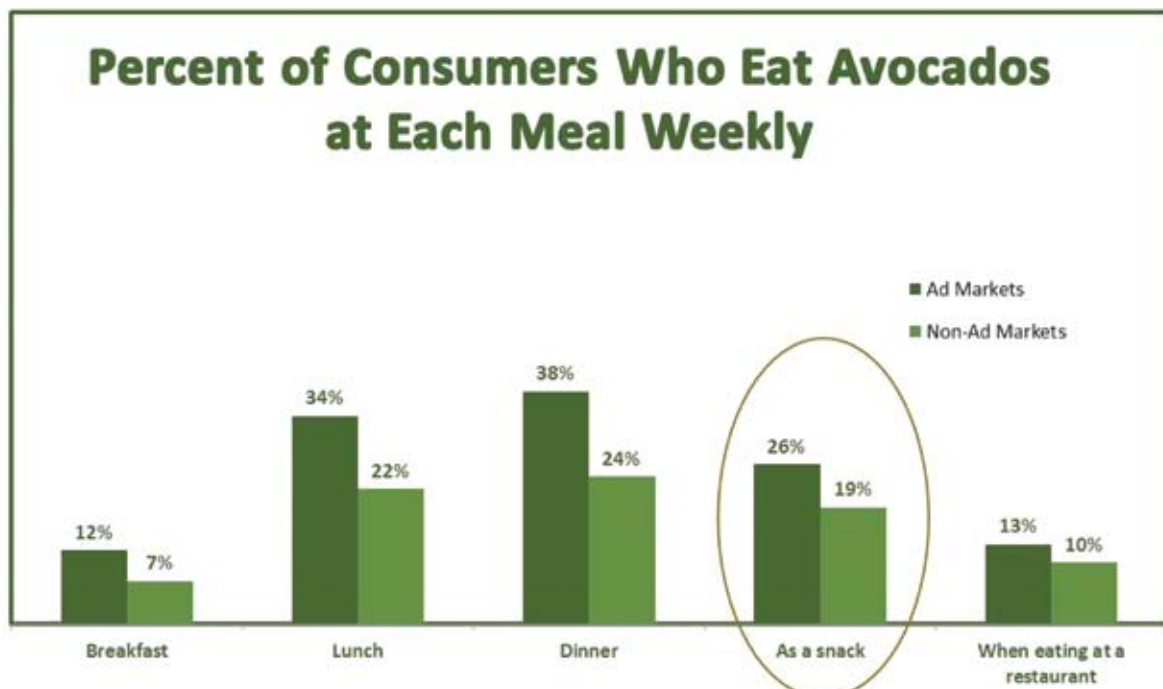
The 2013 Avocado Consumer Tracking Study on avocado usage conducted by Bovitz Research showed that 49 percent of avocado consumers purchase them for snacking, compared to 55 and 66 percent respectively for lunch and dinner usage. Additionally, snacking behaviors are on the rise and now represent about 50 percent of all eating occasions, according to a recent report from the Hartman Group. These studies demonstrate an opportunity to increase Cali-

fornia avocado use for snacking occasions.

“Nearly half of avocado consumers accept avocados for snacking, and snacking is on the rise among American consumers,” said Jan DeLyser, CAC vice president of marketing. “CAC is encouraging California avocado demand by providing creative avocado snacking ideas among the half of avocado users who don’t use them for snacking now, and more usage by those who already do.”

Recipe development to support the snacking campaign involved activity by RDs, recipe developers, bloggers, contest winners, photographers and CAC staff. The recipes include easy snacks with 100 calories or fewer per serving, guacamole and salsas, quick bites such as cracker spreads, tapas, smoothies and make-ahead snack cake. For example, a recipe for Summer Stuffed Avocados encourages consumers to use a small half avocado for snacking.

The Commission front-loaded the California avocado



Source: Bovitz Research, 2013. Q18. How frequently do you eat avocados at each of the following meals...? Please select one response for each item. Base: Ad Markets (n=746), Non-Ad Markets (n=754). B = statistically significant at 95% confidence level.

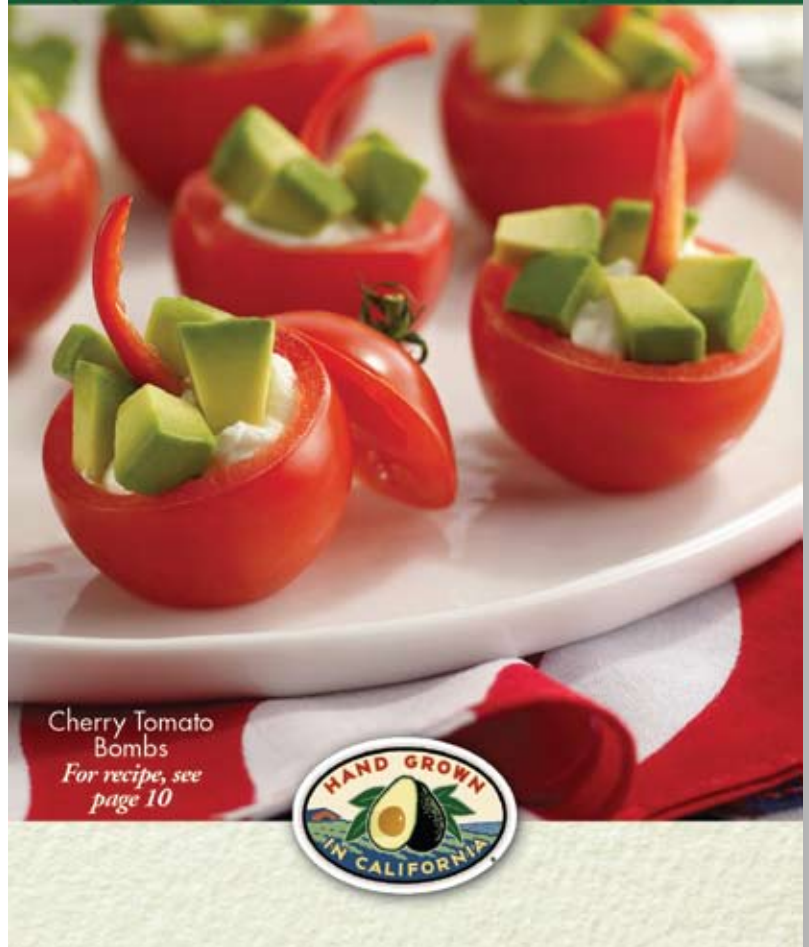
snacking campaign in March by providing supermarket RDs with a tool kit that included nutrition information, data on snacking and recipes that they could use in California avocado marketing programs.

To reach retailers and other decision makers in the industry, CAC issued a trade press release that drew attention to the California avocado snacking campaign. The release was distributed to print and online media in the produce and supermarket industries. There was excellent pick up of the snacking story, including articles in *The Packer*, *The Produce News* and *Perishable News*.

In April, CAC's snacking campaign kicked into gear with a press release and mat release distributed to consumer media that featured four easy and delicious "100-calorie snack" recipes created by RD Katie Ferraro, including California Avocado Cucumber Cups and Power Hour Pick-Me-Up Smoothies.

Retail support included 150,000 recipe brochures titled "California Fresh Snacking with California Avocados". The brochures feature 12 easy, produce-rich California avocado snacking recipes. In addition to recipes, the brochures provide California avocado preparation and handling tips, nutrition information and messaging to encourage consumers to choose California avocados as a healthy meal and snack option throughout the day. The brochures will be available on California avocado in-store displays and will be used by supermarket RDs for in-store avocado-centric activities and events.

Co-marketing partners will help extend the reach of California avocado snacking ideas. One of the recipes in the California Fresh Snacking brochure, California Avocado Cracker Snacks, will be promoted by co-marketing partner Gourmet Garden™ Herbs and Spices. Another recipe, California Avocado Red,



White and Blueberry Salsa is being featured on 200,000 packages of California-sourced Naturipe® blueberries.

The Commission is promoting the snacking initiative through its website, CaliforniaAvocado.com, *The Scoop* blog and in a targeted email to about 165,000 fans. Posts of California avocado snacking images on popular social media sites and a snacking-themed contest will encourage sharing of California avocado snack ideas. 🥑

Grower Profile



David Ross:

Walking in His Grandfather's Shoes

By Tim Linden

Moorpark avocado grower David Ross credits his grandfather often when discussing his entry into the avocado business and the knowledge he has acquired about growing the crop.

And for good reason.

As a kid growing up in Thousand Oaks, Ross spent countless hours swimming in the pool on his grandfather's ranch and running through the groves. After he graduated from college several years ago, Ross called it a "dream come true" when his grandfather Gene Mabry asked him to come help him out on Mabry Ranch, which includes 25 acres of avocados, 25 acres of lemons and the aforementioned ranch house with pool.

Ross had just graduated from Azusa Pacific College in Southern California with a degree in business administration. His grandfather was approaching 80 years of age and needed help. That was in May of 2011. "He brought me along slowly, first teaching me the basics and then we moved into some of the administrative tasks."

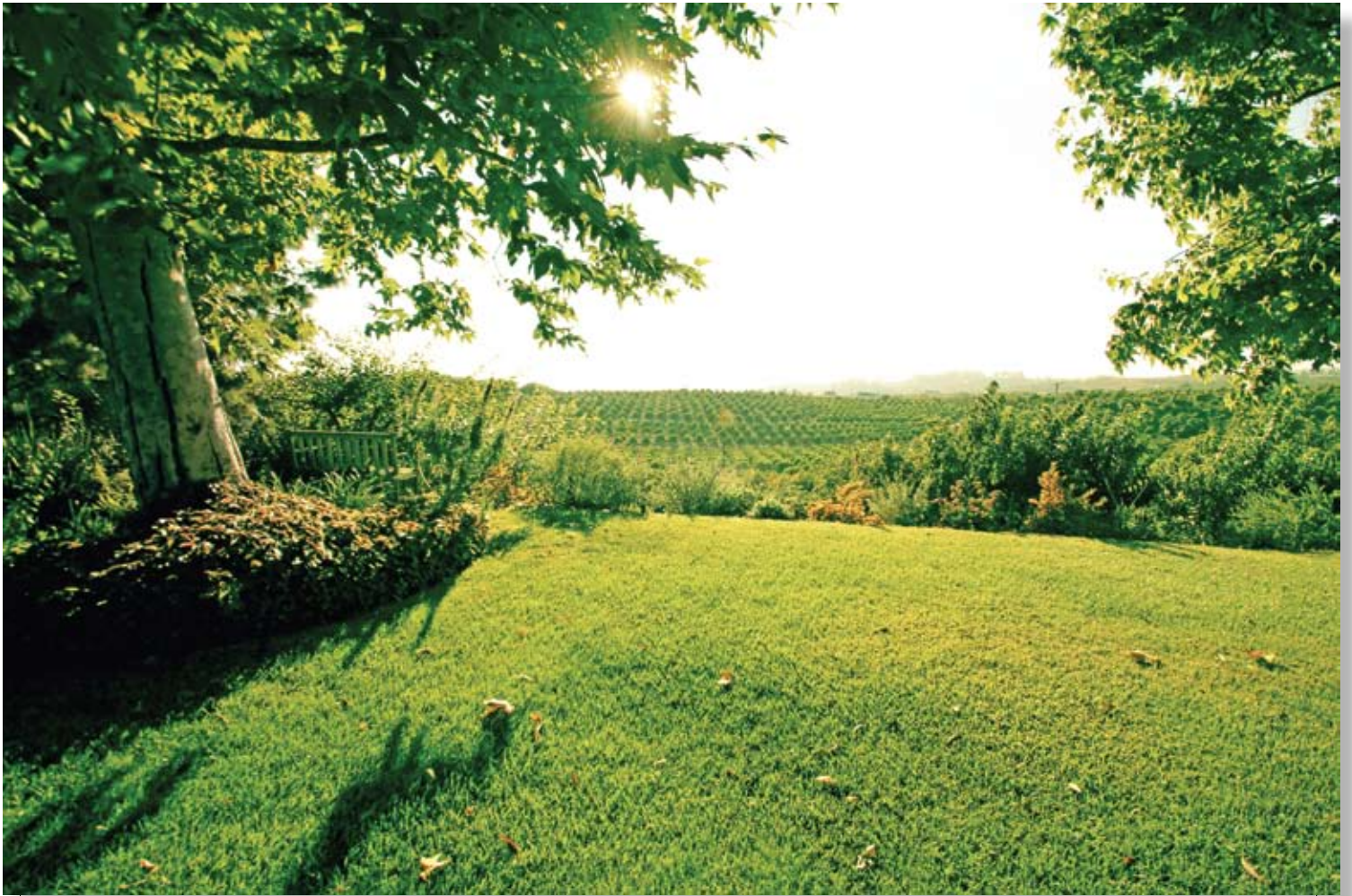
Today, with his grandfather's guidance, Ross is running the operation and using what his grandfather taught him to offer his grove management services to other growers in the area. "I started with irrigation, checking the lines and checking the soil moisture to see when we should irrigate. Then I moved into pruning and picking," Ross said.

He said his grandfather showed a great deal of patience



David Ross and Gene Mabry

as it was a steep learning curve and he needed to master it in a relatively short period of time. "I think the most important thing we have going for us is my grandfather's record-keeping. He has very good data, keeping track of everything he has done over the past 24 years. They say 'knowledge is power' and that couldn't be truer than in managing an avocado grove. He has kept track of everything including how much water and fertilizer he has used



View from the Ranch House

every year on every block.”

Ross explained that his grandfather has examined the records over the years and changed the things that were not working and emphasized what does work.

Ross said Gene Mabry’s career as an avocado grower began in 1989, which was coincidentally the same year his grandson was born. “I’m 24 years old and the ranch is 24 years old,” he said.

Mabry was a mortgage lender in the Los Angeles area for much of his career before transitioning into real estate investments with a portfolio of apartment buildings. That gave him the freedom and the steady income to change his lifestyle by moving to Moorpark and planting avocados and citrus.

Ross described the Mabry Ranch growing philosophy as simple and straight forward. “If the tree needs it, give it to it.”

Armed with 24 years of data and constantly monitoring the trees, they know when to irrigate and fertilize and they are very aggressive in their pruning practices. “We also girdle the trees. We’ve been doing that for three years and this year it is really paying off.”

He explained that girdling is the process of restricting the flow of sugars from the tree’s canopy to its roots, which naturally happens when the trees are stressed by cold weather. “The theory and science behind girdling is that if you keep the sugars in the canopy when the tree is ready to push blooms, the sugar is already there and you get a better bloom and a better fruit set. The first two years we did it we noticed no difference. But this year, when I walk through a grove and look at the fruit on the trees, I can tell without looking which trees have been girdled,” Ross said.

Once again, he said tracking this information and writing it all down is the key to success. “We do a lot of things by trial and error and keep track. If it works, we do it again.”

The Azusa Pacific graduate said it is in this facet of grove management where his college education and degree come in handy. “Record-keeping is very important, also creating and keeping a budget as well as managing people and the products you put on the tree. There are many factors involved in agriculture and the business administration base I have is very important.”

In fact, Ross believes the complicated aspects of farming are what doom many of what he calls “gentlemen farmers.”



Grove Road

He said real estate brokers sell them a ranch and they just don't know how difficult it is to make a crop.

It is for this reason that Ross, who also has a real estate license, is starting to specialize in ag land. "When someone asks me what it costs to plant an avocado grove or to water it, I can look at our records and tell them exactly what we did."

This is also the reason he is offering his ranch management services. Because of the education he has received from his grandfather and the data they have collected, Ross believes he is perfectly positioned to offer help to others. He is currently managing another grove beside Mabry Ranch's three blocks and is in discussions with others. And he said, he and his grandfather are always looking at other land in an effort to expand. "Any grove worth purchasing is either priced too high or not for sale," he quipped.

Ross said there are dilapidated groves for sale that have not been maintained but usually it is because they don't have access to affordable water. He said that is key to being profitable in the avocado business. "We just completed putting in a well on our third block. Now all three of our blocks have well water."

Besides being much less expensive — as they draw from the Fox Canyon aquifer — Ross said the water from the aquifer is higher quality and produces much better tree and fruit growth. On average, he puts 2.5 acre feet of water on each of his acres of avocados. "I've heard of some people getting by on two acre feet but that's cutting it close. What we are doing is maximizing the use of the water by higher density plantings."

During most of the life of their avocado trees, Ross said the data shows an average yield of 6,000-7,000 pounds per acre. But in the last five years, the average has climbed to 8,500 pounds per acre. Part of that, he explained is from the higher density planting, but the rest is from adopting cultural practices that the data says work.

This year, like other growers, Ross said yields are way down because of the alternate bearing properties of the trees. "It's definitely an off year. It's too early to tell exactly what our yields will be but I am estimating around 4,000 pounds per acre."

That will be offset somewhat by the higher field prices being paid. Mabry Ranch has sold its avocados through Calavo for many years and Ross sees no reason to change.

“The packing houses are very competitive so there is not much price difference between them. When you stick with one, you get a lot of good advice from your field representative (from the packing house) and that has been very helpful to us.”

Last year, he said they received an average of 70 cents per pound for their fruit. This year it is almost double at about \$1.30 per pound. They have been picking since February and Ross expects to finish up harvesting in time for the Fourth of July promotions being run by the California Avocado Commission.

He said while the California crop is down, Peruvian fruit has come into the marketplace. “But I like what Lee Cole (president of Calavo) told us last year during a grower meeting. He said: ‘Don’t look at other countries as the enemy. They are our friends. They are increasing demand for avocados and that helps us all.’ You just can’t beat the California quality. So if the demand is there that is good for us.”

Besides his grower and real estate hat, Ross is “passion-

ate about conservation.” He is on the Advisory Committee of the Santa Monica Mountains Conservancy, helping to come up with policies to encourage the survival of wild-life in those mountains. One area in which his role with that group has impacted his farming techniques is in the use of rodenticides. He explained that rats love avocados and lots of growers use blocks of rodenticide to keep the rats away. Unfortunately, other animals — including owls, coyotes, bobcats, even mountain lions — eat those rodenticide-filled rats and can die. “For the last three years, we have been working to get our ranch off of rodenticides and we have been successful. We have put in owl boxes and bird perches as alternatives, and are keeping rat poisons out of our groves.”

By doing that, Ross said Mabry Ranch is helping to maintain the circle of life, which pretty much is the same theory that can be used to explain Ross’ excitement in continuing the work his grandfather started the year he was born. 🥑



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Canopy Management for Avocados

It's important to understand that there is no physiological requirement for pruning trees, including avocados. Trees survive quite well in the natural environment without any pruning or other forms of canopy management. Thus, when we discuss canopy management in an orchard setting we must start by understanding why we are pruning since it is not because the trees require pruning.

In an orchard setting, our goal is to achieve as much fruit production as possible in a given area. To reach this goal frequently requires canopy management through pruning in order to maximize light interception, maintain row clearance for various tasks (e.g., harvesting, spraying, irrigation maintenance), control tree height to reduce harvest costs, and remove dead, diseased or damaged limbs.

Canopy Height

In California, avocados were traditionally very large trees, up to 30 feet or more. Today, the trend is to keep trees shorter — generally no more than 15 feet — to reduce harvest costs and improve the overall quality of the grove. This is more in line with how other orchard fruit trees are managed; however, the chal-

lenge in avocados is that the trees are vigorous and want to grow tall.

For maximum canopy light interception, the rule of thumb is that tree height should not exceed 80 percent of the between-row spacing. For a grove with 20-foot row spacing, tree height should be kept to no more than 16 feet. This ratio ensures that light is able to reach the grove floor and the tree canopy can be maintained to the ground by preventing the lower limbs from being lost to shading.

When to Prune

In California, the challenge to pruning avocados is determining when to prune. Since the crop stays on the tree for more than 12 months there is never an opportunity to prune without crop loss. Thus, the decision becomes partly psychological: is it easier to see the fruit lost when they are small or large? Of course, the decision also partly depends on your pruning method.

Usually in an environment such as California, pruning after harvest removes both flowers and developing fruit (depending on harvest timing) and may expose fruit to sunburn. Thus, many growers prune following the on-crop harvest when the trees are in an off year to minimize fruit

loss. In citrus, where late varieties such as 'Valencia' also carry two crops at the same time, research has shown that if pruning is carried out at the same time each year, the trees naturally adjust and yields stabilize after a few seasons. Whether this holds for avocado is unknown.

Aside from late fall and winter when pruning could stimulate new growth that is easily damaged by frost, there really is no wrong time of year to prune avocados in California. Again, timing will in part depend on your pruning strategy.

Where to Prune

There is no prescriptive pruning program that can be applied to every tree. Rather, each tree needs to be looked at as an individual with a pruning strategy devised for that individual tree. This is easier than it sounds if you have a goal in mind, follow a few basic principles and know how the tree will respond to different types of pruning cuts.

In the last issue of *From the Grove*, several terms and concepts were presented concerning the architecture of the avocado tree and its proleptic and sylleptic shoot growth. Because pruning affects shoot growth of the avocado tree, it is important

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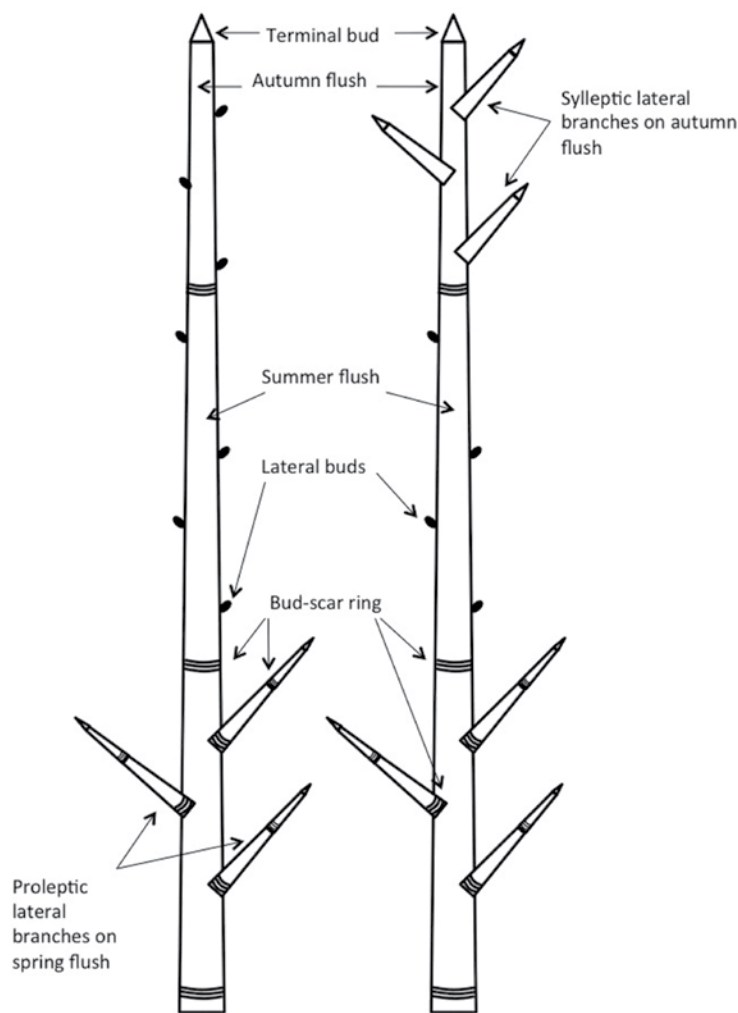


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A diagram of two different shoot structures that may be found in an avocado tree canopy. Both shoots are composed of three flushes of growth – spring, summer and autumn. The shoot on the left has strong apical dominance and the lateral buds on the summer and autumn flushes have not grown out. The shoot on the right has weak apical dominance and the buds on the autumn flush have grown out into sylleptic lateral shoots.

for us to review the terminology. The first concept to remember is apical dominance — the inhibition of the growth of lateral buds by the terminal bud or meristem. The figure shows two types of shoots that may be found on an avocado tree. The shoot on the left has no lateral branching (the terminal bud has exhibited strong apical dominance); the shoot on the right has sylleptic lateral branches (the terminal bud has

exhibited weak apical dominance). If the terminal bud on each of the shoots is removed by pruning, the responses will be very different. The shoot on the left would develop several lateral branches because the apical dominance has been broken. In contrast, removing the terminal bud from the shoot on the right would have little effect since each of the sylleptic lateral branches is controlled by their own terminal bud.

Tip or Terminal Bud Pruning

In practice, tip or terminal bud pruning can be used in an on-crop year — that is a year in which a large crop is developing for harvest the following year — to try to mitigate alternate bearing. Usually, in a heavy on-crop year, the developing fruit will suppress the summer flush that will produce next season’s flower buds, leading to alternate bearing. By observing your trees and doing some selective tip pruning (of non-bearing shoots) in an on-crop year, you may be able to stimulate more summer flush, increasing next year’s flowering potential and reducing the magnitude of alternate bearing.

In contrast, in an off-crop year, you may want to try to control the amount of summer flush and do some tree-size-control pruning. In this case, removing terminal buds on shoots with sylleptic lateral branches or pruning back to lower lateral branches will reduce the growth response from the pruning cut and help control growth and vigor.

Selective Limb Removal

In a lot of cases, it is more economical and a more efficient use of time to make a few larger cuts per tree rather than many small cuts. In these situations, selective limb removal is the best choice, but as with terminal bud removal how and where the cuts are made will determine the growth response. Generally, this type of pruning starts by removing crossing branches, especially those that are rubbing together.

If tree height control is one of your goals, look for water shoot/sprouts, which are vigorous shoots growing straight up with few if any branches. These shoots will emerge from the top of the canopy and can add several feet to overall tree height in a single season. They should be removed flush with the limb they arise from.

Following crossing limb and

water sprout removal, ask yourself if the interior of the canopy is becoming too shaded — are the inner canopy branches dying back, is there little or no interior fruit production? If so, consider removing one or two relatively large limbs (three- to five-inch diameter) to open some light channels into the canopy. Again, if tree height control is a goal consider your limb choice carefully so that you can reduce the overall height of the tree and open light channels at the same time. When making thinning cuts it is usually best to remove the limb flush with the adjoining branch by making your cut at the branch collar — the area of wrinkled bark where one branch joins another. This will promote healing and minimize regrowth. If you leave a short stump, multiple new shoots are likely to regrow and require follow up pruning.

Following selective limb removal you will need to monitor the tree. If the interior was just starting to become too shaded there may not be any follow up pruning needed. However, if the interior of the canopy was completely barren of leaves, selective limb removal will stimulate a lot of new growth, which will require follow up pruning. Follow up pruning should thin the number of new shoots and prevent the development of water sprouts by removing the terminal bud on very vigorous shoots to induce lateral branching.

For trees being trained to central leader — usually high-density plantings — the same principles and types of pruning cuts apply. However, your pruning strategy should work to bring the canopy into the center rather than allow it to spread.

When practicing selective limb removal keep in mind where your crop was and will be. If you have just harvested an on-crop, select limbs for removal that had a heavy crop on them since they will likely set less fruit next year than limbs that produced few or no fruit. In this way, you

can help to balance the trees and reduce the risk of exacerbating alternate bearing.

Pruning Sanitation

Although growers prune their groves with good intention, the results can be disastrous if some basic principles of sanitation are not followed. First and foremost is to avoid pruning when trees are wet. When the canopy is wet, any fungal pathogens that may be in the canopy will release spores — fungal reproductive bodies — that can enter fresh pruning wounds. Pruning only during dry conditions will reduce this risk.

To further reduce the risk of disease spread, pruning tools need to be sanitized often. It's best to sanitize after pruning each tree. This is easily done using a spray bottle with a 25 percent household bleach solution or 70 percent ethanol solution. If you are pruning a tree with known disease issues (e.g., branch canker), remove the diseased material from the grove rather than leave it on the grove floor.

Of critical importance in California is Avocado Sunblotch Viroid (ASBVd). Pruning easily spreads this disease and it is virtually impossible to disinfect pruning tools. For this reason, growers should familiarize themselves with ASBVd symptoms and remove infected trees to prevent the unintentional spread. However, growers must also be aware that there is an asymptomatic form of this disease, the symptom of which is no fruit production. Thus, growers should monitor their tree yields carefully — some growers spray paint different colors on the trunk to represent high, moderate, low and no yield — and remove any trees that have not produced fruit for three consecutive seasons.

A more complete discussion of pruning and grove sanitation can be found in the Winter 2013 issue of *From the Grove* ([www.californiaavoca-](http://www.californiaavoca)

dogrowers.com/publications/from-the-grove).

Growth Regulators

California avocado growers can use the product Tre-Hold® Sprout Inhibitor (AMVAC Chemical Corp.) to aid in canopy management. Tre-Hold® contains naphthalene acetic acid (NAA), which is a synthetic form of the plant hormone auxin. Auxin is the chemical produced by terminal buds that allow them to exert apical dominance over lateral buds. Thus, applying Tre-Hold® to a pruning wound effectively restores the apical dominance and suppresses regrowth.

Tre-Hold® is applied in a latex-based paint, which can be brushed or sprayed on the cut surface. It is difficult to give usage recommendations for a product like Tre-Hold® because its efficacy is dependent on both rate and dosage of the chemical. That is to say, the same rate (i.e., quantity of active ingredient per volume of paint) will give different results if applied lightly or more heavily. Thus, growers interested in using Tre-Hold® should do some small-scale trials and get a feel for the product. Because application is critical to efficacy, the same person should apply the product to all pruning cuts to ensure consistent results. Many growers who have taken the time to learn how to use Tre-Hold® in their grove management program find it to be a useful tool.

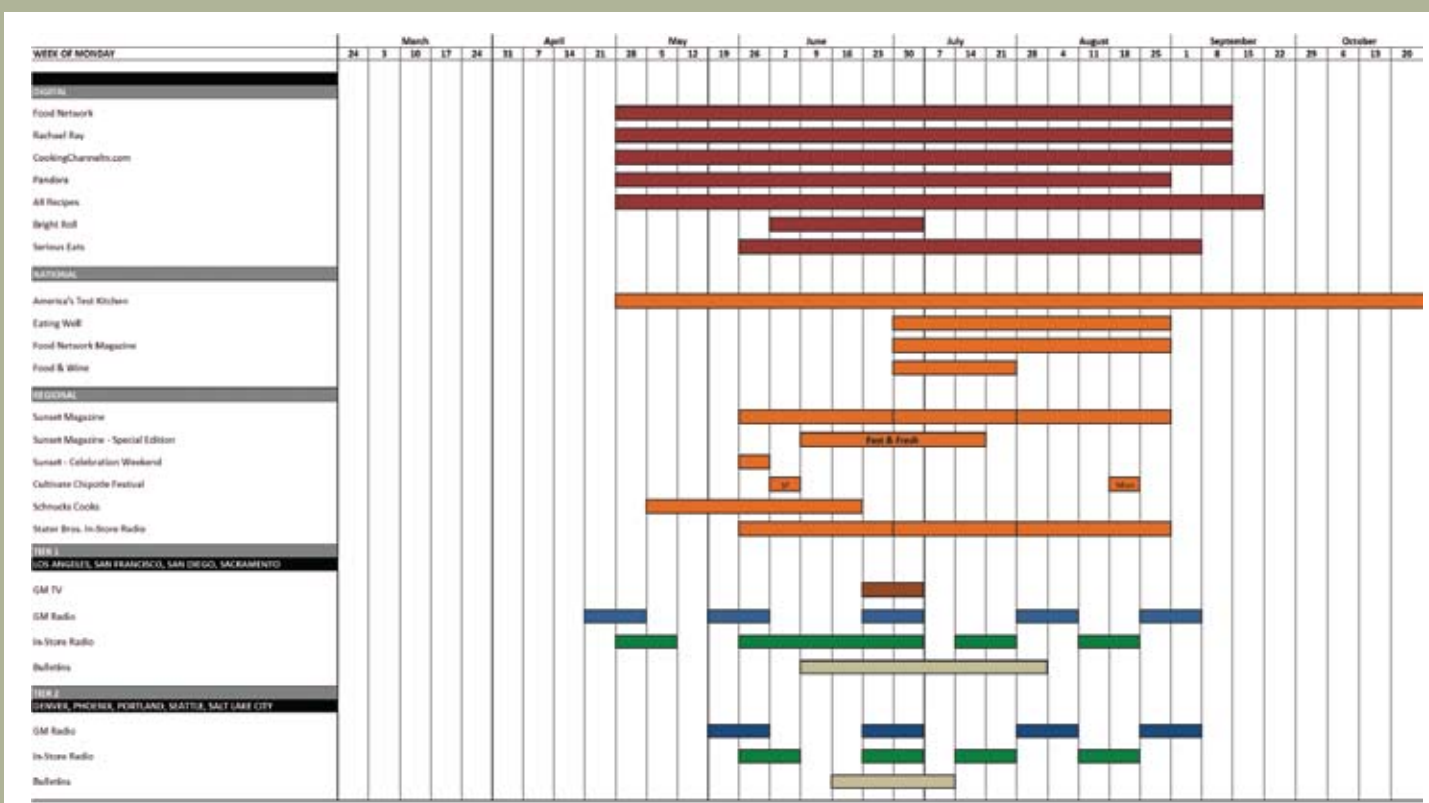
Canopy management in avocados can seem like a daunting task. However, having a plan and following a few basic principles can simplify the task. If you've never ventured into the realm of pruning before, make some cuts on a few test trees before pruning your whole grove. Keep notes or take before and after pictures so you can remember what type of cut you made and what the response was. But remember, each tree is unique and must be treated as such. 🥑

Integrated Promotion Campaigns Provide Premium Brand Positioning

To reinforce the premium positioning of California avocados and increase brand awareness, demand and value in target markets during the California avocado season, the California Avocado Commission (CAC) integrates the creative and strategy for its consumer, retail trade and foodservice advertising campaigns.

This integration ensures key brand messages are consistent across all targeted audiences throughout the California avocado season and allows for customization that address-

es the concerns of each audience. For example, while the trade advertising campaigns incorporate branding similar to the consumer ads, they also include key messages that keep fresh California avocados top-of-mind for retailers and foodservice operators in an era of increasing competition from global competitors. In addition, the trade ads enhance the Commission's leadership position in the produce industry by illustrating the benefits of providing premium, fresh California avocados to increase in-store and foodservice sales during the California avocado season.



The combined communications of the 2014 Consumer Advertising Plan are expected to generate 950 million impressions.



This consumer ad encourages consumers to purchase premium, fresh California avocados while they can — during the peak of the season.

Consumer Advertising: Making California Avocados Synonymous with Summer

The consumer ad campaign, which kicked off April 21 and will run through September 7, reinforces several key messages: California avocados are in season, they are the “premium” avocado and they are synonymous with all the major summer holidays.

Designed to increase retail sales, the consumer ad campaign is expected to deliver an estimated 950 million impressions with television, general market radio, in-store radio, outdoor bulletins, print ads in national epicurean publications and digital outlets. CAC will provide retailer support with radio tags and in-store advertising.

As in the past couple of years, ad awareness will ramp up prior to and through the 4th of July with print ads appearing in the July issues of *Food Network Magazine*, *Food & Wine* and *Eating Well*. The Commission has increased mobile advertising this year to tap into the growth of consumers’ reliance on mobile devices and to make sure our message is accessible to consumers throughout the day. Digital

ads will run online and on mobile throughout the season on epicurean sites, Pandora and a mobile ad network.

To promote premium messaging on a national basis, the Commission is continuing its sponsorship of *America’s Test Kitchen*, and will strengthen consumer awareness and showcase avocado usage ideas by participating in two key events with engaged avocado enthusiasts: *Sunset Magazine’s Celebration Weekend* in Menlo Park, CA; and *Chipotle’s Cultivate Events* in San Francisco, CA, and Minneapolis, MN.

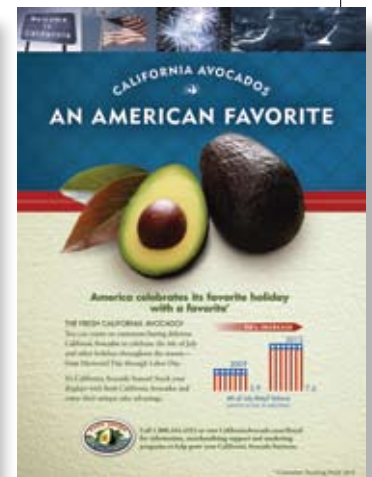
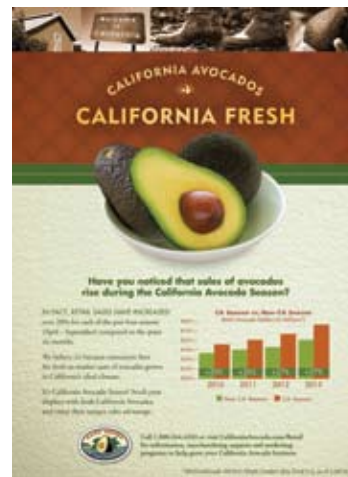
An in-depth look at the creative and strategy behind CAC’s consumer advertising can be found in the Spring 2014 *From the Grove* issue.

Retail Trade Advertising: Keeping California Avocados Front-and-Center in a Competitive Industry

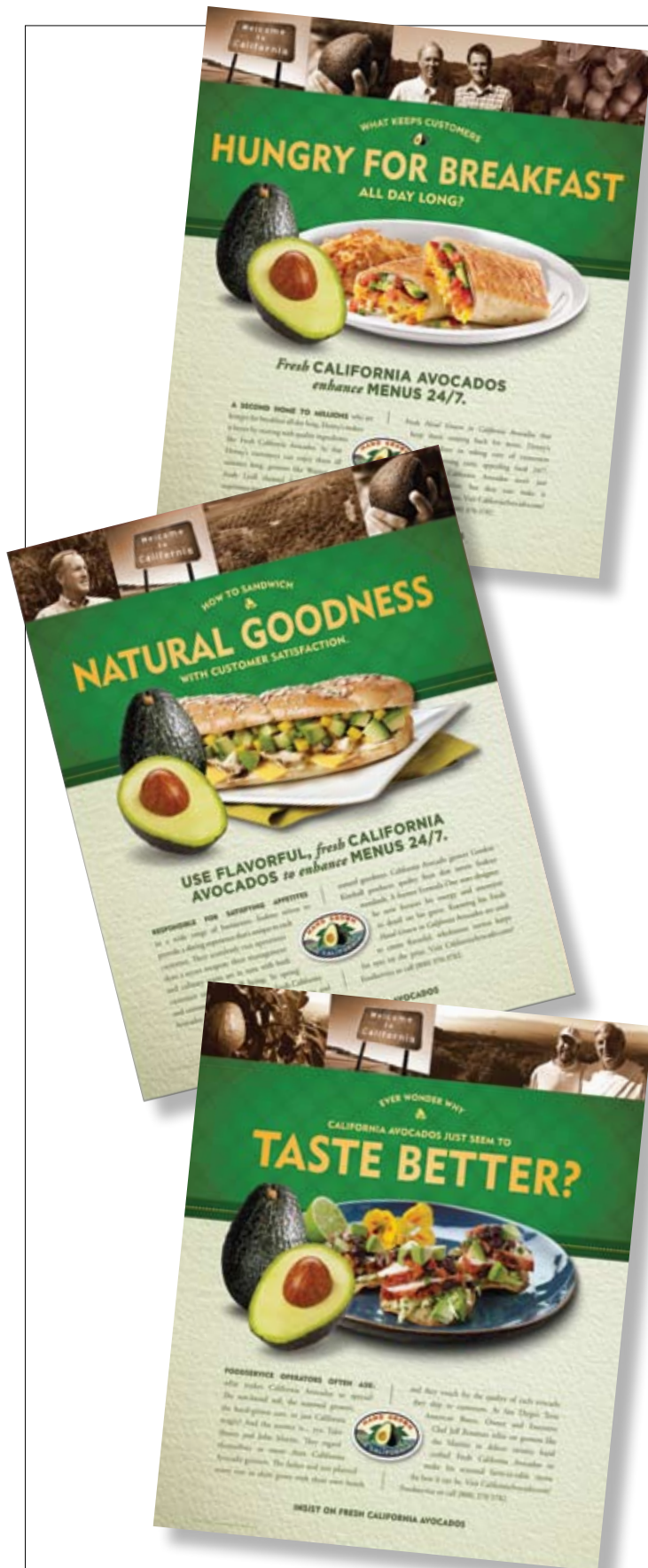
Front-page banner ads in *The Packer* and *The Produce News* marked the launch of the 2014 CAC retail trade ad campaign on April 7. Similar to the consumer ad campaign, retail trade advertising will establish premium brand identification of California avocados throughout the summer.

To differentiate fresh California avocados from the increasing number of global competitors, the ads incorporate CAC’s branding guidelines and premium messaging and focus on the value premium California avocados provide retailers by increasing consumer demand in season.

Two unique full-page ads will showcase California avocados. The *California Fresh* ad will run throughout the season while the *An American Favorite* ad will run prior to the 4th of July to reinforce California avocados’ positioning during this key avocado promotion event. These ads are intended



These two ads communicate the California avocado promotional opportunities to retailers, demonstrating the bump in consumer demand and sales throughout the California avocado season and during the key 4th of July holiday.



The foodservice industry ads showcase the benefits of selecting fresh California avocados for unique menu items, featuring three of CAC's targeted audiences — an independent restaurant, a chain restaurant and an onsite/non-commercial operation.

to build awareness with key retail decision-makers on the promotional opportunities with California avocados for the 4th of July, as well as to communicate the growth the holiday has experienced. Ever since the Commission has been fielding a 4th of July marketing campaign, the event has ranked in the top three avocado consumption events of the year.

CAC has carefully determined ad placement based on past advertising impressions and test runs of ads in print and digital publications. This year, *The Shelby Report West*, *Progressive Grocer Independent* and *The Snack* magazines have been added to the advertising mix. Ads will also appear in *The Packer*, *The Produce News*, *Produce Business*, *Fresh Digest* and *Progressive Grocer*. To meet the industry's growing interest in online publications, digital ads will appear in *SmartBrief*, *FMI*, *The Produce News Digital* and *AndNowUKnow*.

Based on the same budget as 2012 and 2013, the 2014 media plan is expected to generate approximately 2.8 million impressions — an additional 15,400 impressions from 2013.

Foodservice Advertising Campaign: Hand-Grown, Consistent Quality as a Differentiator

To generate pre-season excitement and interest in fresh California avocados, the foodservice advertising campaign began in January 2014. The foodservice industry has a longer lead time on promotions and menu plans so the California avocado foodservice campaign starts earlier than other communication. Echoing CAC consumer advertising in style and tone, the foodservice ads have an easily identifiable "Hand Grown in California" feel that emphasizes California avocado grower commitment to quality and consistency and provides a farm-to-table sense of community that appeals to restaurant industry decision-makers.

The three ads were designed based on the performance of last year's foodservice advertising results. The Hand Grown in California ad featuring Denny's in the August 2013 issue of *Restaurant Hospitality* ranked third out of 29 ads. The Hand Grown in California ad featuring Terra Restaurant in the July/August 2013 issue of *Plate* ranked second for "believable" and fifth for "enhances image." For that reason, the Commission is once again featuring operators, such as Sodexo, Terra American Bistro and Denny's, in CAC's foodservice advertising. The ads also showcase the benefits of selecting fresh California avocados and provide innovative menu applications for independent restaurants, chain restaurants and onsite/non-commercial operations.

The three ads will appear 14 times throughout the season, and will appear in *Restaurant Hospitality*, *Food Management* and *Plate*. The campaign, which ends mid-August, is expected to generate more than 900,000 impressions. 🥑

Determining Water Use Efficiency

By Ken Melban
Director Issues Management

During the California Avocado Commission's (CAC) recent grower meetings in April, some questions were asked regarding equipment that assists growers in determining water use efficiency. Specifically, what types of equipment and which manufacturers would we recommend for determining and improving water use efficiency?

Although we cannot recommend one brand of equipment over another, we decided it may be helpful to provide a sampling of what some growers have found beneficial in their farming operations. I spoke with several growers, from smaller scale (5-10 acres) to very large-scale (up to 400 acres) operations, to learn about their utilization of irrigation efficiency equipment, tools and resources. This article is not intended to be an all-inclusive list of options that exist, but hopefully will serve as a general overview and provide a good starting point for those growers who are looking for some direction.

Why is Water Use Efficiency Important?

Water use efficiency is a percentage value that indicates how much of the applied water in a grove is utilized by the trees. Factors such as runoff, deep percolation, irrigation system leaks, and soil evaporation reduce water use efficiency below 100 percent. By understanding the factors that affect water use efficiency, properly maintaining and repairing irrigation systems and applying water properly for maximum tree uptake, water use efficiency in an avocado grove can reach 85 percent. In addition, efficient application of water improves tree water status, which can increase tree productivity and potentially result in overall lower water use.

Determining Evapotranspiration (ET)

The first step in properly irrigating a grove is to determine the ET requirements. As I'm sure you all know, ET is the loss of water to the atmosphere by the combined processes of evaporation (from soil) and transpiration (from plant tissues). ET is also an indicator of how much water avocado trees need for healthy growth and productivity. Determining an accurate ET for each grove is essential for scheduling irrigation.

All of the growers I talked with had a system intended to "zero in" on their individual groves' ET requirements. The California Irrigation Management Information System (CIMIS) is a program in the California Department of Water Resources that manages a network of more than 120 automated weather stations in the state of California (<http://www.cimis.water.ca.gov>). CIMIS station data is provided to assist California's irrigators in efficiently managing their



A base station determines ET by tracking variables like temperature, humidity, wind speed, wind direction and rain.

water resources by estimating crop water use for irrigation scheduling. CIMIS can be a good starting point, but may not provide precise enough information for your grove. For example, if the nearest CIMIS station is five miles away, weather conditions could be significantly different from your grove and therefore your ET for that day may vary. In addition, other factors like soil type will have a direct impact on your irrigation requirements and scheduling.

One farm manager discussed a system they utilize that includes weather stations on some of their properties. Each property has one main base station and nodes that wirelessly transmit data to the base. The base stations cost around \$4,500 each and determine ET by tracking variables like temperature, humidity, wind speed, wind direction and rain. The node equipment varies by ranch, but the most common setup is to have temperature, wind speed, and soil moisture sensors connected. Each node costs approximately \$1,000, with temperature and humidity sensors at \$425 and soil moisture probes running about \$1,000 each. So, depending on equipment add-ons, each node setup will cost another \$2,000-\$3,000. There is a monthly fee for each system — \$65 for the base station and \$5 for each node. Another option is the cell node, a stand-alone system that is used when you only need data from one location. The advantage of the cell node is that it is smaller and less expensive, with start-up equipment costs of around \$2,000 and monthly service at about \$30.

A graph showing one month of soil moisture probe data (Figure 1) allows the user to see the spikes (when there is an irrigation set) and then see soil moisture levels decrease as water is used. A web-based system provides the user with

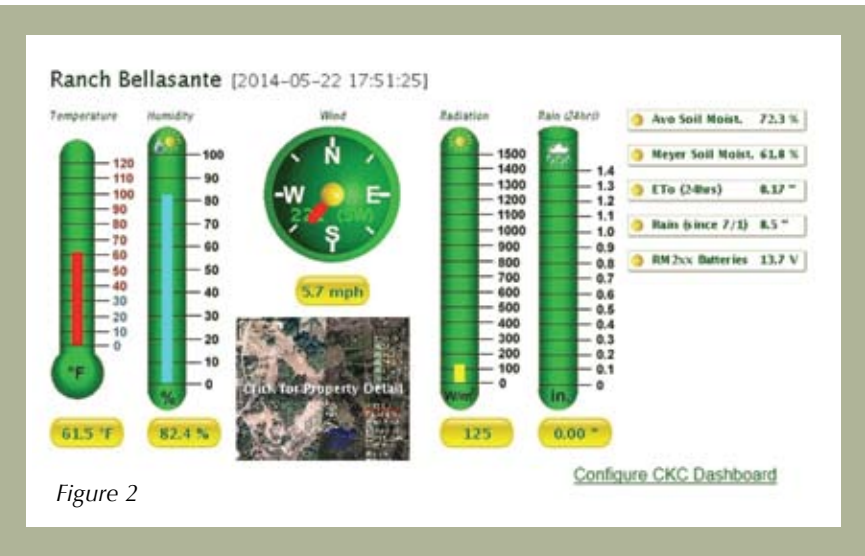


Figure 2

a dashboard of their account, providing specific results updated every 15-30 minutes (Figure 2). One challenge is that you either need an ATT or Verizon cell signal for the systems to work, which for this grove manager hasn't been an issue in Ventura County, but it has been problematic in parts of Riverside and San Diego counties. Frost alerting is another available feature of this system. A low temperature threshold is entered into the online program and when that temperature is reached the system will call or text you.

Although the options discussed thus far require fairly significant start-up costs, there are less expensive options too. In the last issue of *From the Grove*, Dr. Tim Spann discussed the importance of soil moisture monitoring in an article entitled "Coping with Drought". He reported the results of a recent survey conducted by UC Riverside researchers which found that "60 percent of California avocado growers never monitor soil moisture. And of those who do monitor soil moisture, the majority does it by feel." Other growers I talked with use very inexpensive tensiometers (around \$30) that they monitor manually in their groves.

There is a YouTube video from Dr. Gary Bender, UC Farm Advisor, explaining how a tensiometer works and how to install one in an avocado grove (www.youtube.com/watch?v=UHVlvAO5NDQ).

Also, once the ET is determined for your grove, an irrigation calculator such as the one available on AvocadoSource.com (www.avocadosource.com/tools/IrrigationCalculator.asp) is a great resource.

System Design

Unfortunately, there is not a "one size fits all" solution as groves have individual characteristics such as soil type, slope, irrigation system uniformity, etc. So it's important to develop a system that works in your grove. If your grove falls within the lower Santa Marg

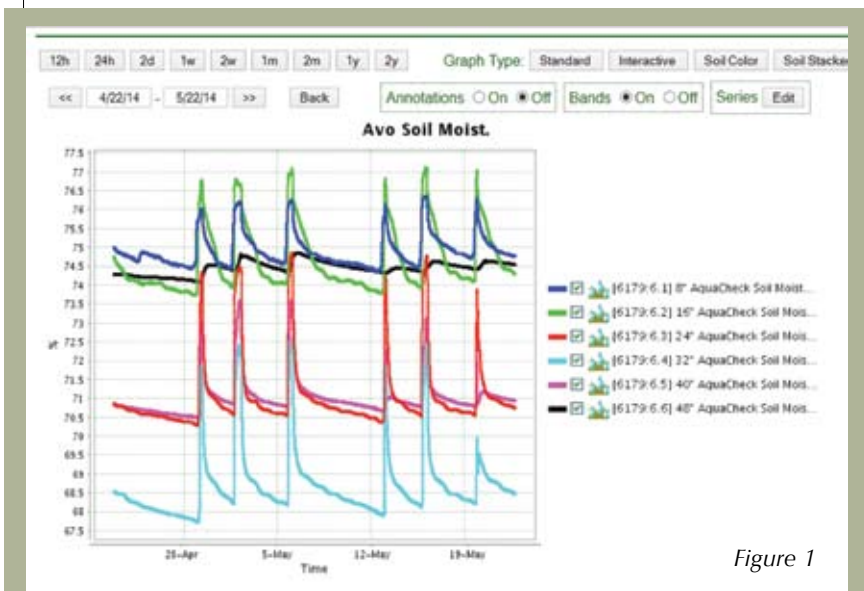


Figure 1



Avocado grower Gene Bianchi manually reads a tensiometer.

rita and middle and lower San Luis Rey watersheds, Mission Resource Conservation District offers local landowners and stakeholders free irrigation system evaluations to help growers assess the irrigation schedule and uniformity of the irrigation systems (www.missionrcd.org/).

Additionally, the Rancho California Water District offers Agricultural Water Use Efficiency Programs to assist farmers in determining their system's water efficiency, and in some instances, provides incentives towards equipment (www.ranchowater.com/index.aspx?nid=190). You may want to contact your local water agency to determine if they offer

similar assistance or can provide other alternatives.

Quite a few options have been presented, ranging from relatively inexpensive to more costly alternatives. As the drought emergency continues, and overall challenges to our water supply and affordability increase, any improvements in water efficiency — big or small — are valuable. If you haven't yet taken steps to ensure your irrigation system and practices are efficient, I would encourage you to consider starting soon. If you have any questions feel free to contact the Commission at cac.iaf@avocado.org. 🥑



CAC 2014 Annual Meetings

Vision 2025 Impact on Programs Explored

The California Avocado Commission (CAC) Annual Meetings were once again well attended with more than 250 industry stakeholders attending April 8 through April 10, 2014, in Fallbrook, Santa Paula and San Luis Obispo. While last year's meetings featured a panel discussion from retail and food service experts, this year management returned to a more typical format of reports from staff on Commission activities.

Each meeting began with a round of introductions, followed by President Tom Bellamore's review of how CAC's Vision 2025 is the impetus behind the Commission's marketing, production research, outreach and advocacy initiatives in an era of increasing competition, supply and demand for avocados.

Bellamore noted that per capita avocado consumption in the United States has now reached 5.4 pounds annually and usage has shifted to heavy and super heavy users, thus creating sufficient demand to absorb significant increases in

supply. That said, California's premium positioning remains a critical factor in differentiating the California avocado especially as the California avocado industry cannot compete on price. Bellamore discussed CAC's premium positioning marketing strategies that engage with and make an emotional connection with the consumer, as well as market the exclusivity of the California avocado. These strategies, he noted, are working: consumers think California avocados are premium (3:1) versus Mexico.

Bellamore concluded his presentation by introducing the California avocado on-fruit labeling initiative, a well-researched project to improve California branding right on the fruit and provide stronger connectivity between CAC's marketing activity and the avocados themselves. He explained that a variety of new California labels will begin to be applied by packers starting this season. This news was met with very favorable response by California avocado growers in attendance.

Marketing

Jan DeLyser, CAC's vice president of marketing, began her presentation with a look back at CAC's 2013 advertising efforts that communicated the "all avocados are NOT created equal" messaging. Building on that message, DeLyser showcased the new 2014 campaign that focuses on illustrating three key messages: California avocados are only available for a limited amount of time, in a limited geography and they take a unique journey to market. The samples clearly illustrated the contrast between the California positioning and that of "Avocados from Mexico."

DeLyser then highlighted current marketing initiatives scheduled for the 2014 season including avocado labeling, public relations, CAC's new blog, co-marketing, super-market registered dietitians, food service and a summary of trade calls.

Industry Affairs

Ken Melban, CAC's director, issues management, shared the Commission's mission statement with attendees — and in light of CAC's industry affairs responsibilities to California avocado growers — placed special emphasis on the final three words: improving grower sustainability. Melban's presentation focused on the very issues that challenge California avocado industry sustainability — water pricing and availability, new product registrations, pursuing California access to new global markets, phytosanitary concerns, immigration reform and food safety — and the steps CAC has taken to address these issues on behalf of California growers.

He elaborated on the topic of food safety, noting that the Food Safety Modernization Act (FSMA) will require growers to demonstrate compliance with specific practices to mitigate risk. Although implementation of FSMA has been delayed until 2015, Melban noted the increasing importance retailers are currently placing on GAP certification.

Grower Outreach and Communications

CAC's industry affairs manager April Aymami shared plans for the Pine Tree Ranch demonstration grove and CAC's continuing efforts to provide growers with the latest information concerning cultural management best practices. It was noted that to-date the Commission had held two field days at the demonstration grove, with the inaugural event drawing more than 100 attendees to the Santa Paula property. Aymami encouraged growers to attend the June 26 field day which will focus on irrigation and water quality management, as well as feature new planting demonstrations. On the communications side, she advised attendees of the availability of the Commission's 2012-13 annual report and discussed the importance of the annual grower crop estimate survey.

Production Research


Dr. Tim Spann, CAC's research project manager, provided an overview of the Commission's Production Research program and funded projects designed to help growers face current and long-term challenges. Specifically Spann highlighted the following recently-concluded projects:

- In light of developing resistance to abamectin, Dr. Joe Morse, University of California Riverside (UCR) has developed efficacy data for and registered six pesticides to supplement abamectin for use in avocado thrips and perseá mite pest management.
- Dr. Frank Martin, of the U.S. Department of Agriculture lab in Salinas, is working on a system for better diagnosing Phytophthora.

Spann also updated attendees on the status of the polyphagous shot hole borer research and noted that the Commission was working with the California Department of Food and Agriculture to coordinate a task force to help tackle this issue. Lastly Spann covered the restructure of CAC's plant-breeding program to focus on developing rootstocks that are more resistant to Phytophthora and better adapted to salinity.

Tom Bellamore concluded the presentations and opened the floor to questions. At the three sessions, two topics took precedence for growers: the increasing competition presented by Mexico and questions concerning the need to become GAP certified.

In response to growers' concerns about Mexico, Bellamore reminded the audience about CAC's long involvement in federal rule making that focused on pest risks. From a regulatory perspective, the Mexican Avocado Import Program has essentially remained unchanged since 2007. As USDA now considers its next steps, it will be important to maintain the program's integrity and ensure that compliance with the necessary phytosanitary protocols is not compromised. This time around, Bellamore said, growers in Michoacan and growers in California have a shared interest in a staged approach to program expansion where access is achieved only after pest mitigation steps are well documented. No one wants the market disruption that could result from a poorly regulated systems approach for pest management.

As concerns GAP certification, Bellamore urged growers to be proactive for two major reasons. First, much of the imported avocado supply is already Global-GAP certified. Next, while there is currently a market for all California avocados, as retailers increasingly require GAP certification, those California avocado growers who are GAP certified will have a competitive edge over those who are not. He noted that those growers who are GAP certified will "be the first in line and other growers won't be ready." 

By Gary S. Bender

Farm Advisor - Subtropical Horticulture
UC Cooperative Extension, San Diego County

High Density Avocado Production: Could this be the Future for California Growers?

Water prices are going up, market prices for fruit are remaining flat, and San Diego growers are either turning off the water or complaining to me!

To cope with high water prices and maintain productive groves, we have tried varying the timing for fertilizer applications, installing better irrigation systems, leaching the salts on a regular basis and spraying for thrips. Some growers have tried all kinds of “magical” things that are supposed to “inactivate the salts in the water,” or help growers use less water, or change the microbiology in the soil – in other words, a lot of cool-looking expensive devices. But nothing has really boosted our yield per acre so that we can afford to pay those high water bills.

What about tree spacing?

When I first started as a farm advisor, I asked a grove manager, “Why are avocado trees grown on a 20’ x 20’ spacing?” He replied, “Well, that was the length of the PVC irrigation pipes.” This is another way of saying, “You University guys haven’t done any spacing trials, so we are going to go with what is easiest.” Not quite true. Platt et al. wrote a research paper in 1976 on yield production in a thinned ‘Fuerte’ grove showing that thinning a crowded grove could actually result in a substantial increase in yield. In their case, crowding occurred after the 14th year and yields remained low during years 15-19. The grove was thinned to 54 trees

per acre, then yield per acre recovered to the highest production for the grove in year 22.

Platt was a firm believer in achieving “mature tree size” without excessive crowding. In his research paper he noted, “Planting a greater number of trees per acre requires a positive program of growth control and orchard thinning ... the wisdom of extremely close initial tree spacing is sometimes questionable. Yields attained before crowding of non-precocious cultivars occurs are often not sufficient to compensate for the additional cost involved.”

University of California (UC) farm advisors and specialists have not completed any spacing trials looking at high density plantings, probably because it’s difficult to find a grower willing to chop up a grove into a lot of different spacings with the inherent pruning, fertilizing and irrigation considerations. And, of course, researchers need to have several replications for each spacing trial so we can run the statistics.

For years growers have believed that avocados could be successfully grown just by fertilizing, irrigating through the irrigation system, and leaving pest control to predators and parasites. If we really had to, some growers think, we could spray by helicopter — all we have to do is harvest! This attitude was ingrained in California avocado growers for many years. But now things have to change.

In California, Reuben Hofshi

stated the case for why trees should be planted at a higher density:

“To compete in the international market with low avocado prices will require more efficient farming and a significant increase in productivity.”

Young trees are vigorous, produce large fruit early, have better canopy to root ratio and reach peak productivity approximately by seven to eight years.

Smaller trees are easier and less expensive to harvest, particularly when size picking is done, and are very amenable to snap harvest.

Spraying for different pests may become a way of life; smaller trees are probably the only ones that could be efficiently sprayed by ground rigs in hilly terrain.”

Training avocado trees for high density plantings should begin in the nursery in order to create a strong dominant central leader. Our nurseries normally prune the leader off the ‘Hass’ trees to create a spreading effect. Trees with a more natural central leader are ‘Reed’ and ‘Lamb Hass’. ‘Reed’ has a strong natural central leader that allows for more light penetration into the lower canopy, resulting in good fruit set in the lower canopy, so Hofshi tried an ultra high density planting of ‘Reed’ trees at 7’ x 7’ with pruning height kept at less than 8’. This was equivalent to 798 trees per acre. For years three through six, this planting yielded 7,050, 28,200, 50,109 and 88,613 pounds per acre. Those were incredibly high yields for avocado! But these were ‘Reed,’ not ‘Hass’ — and

the marketplace wants 'Hass'. Could anything like this be possible with 'Hass'?

Other countries have been exploring closer spacing of 'Hass' avocado trees with intensive pruning in order to increase yield and some of that information has been filtering back to California. One research team has been planting on steep slopes with shallow soils (similar to San Diego groves) and they have settled on a spacing of 10' x 10'. This allows light management on all sides of each tree and they will not be grown as hedgerows. The proleptic side shoots are cut out and the sylleptic upright shoots are kept to create a pyramid-shaped tree. Water shoots are removed. Their trials will use strong pruning every six to eight years to bring the trees back under control. And they are using uniconazole or paclobutrazol sprays in the spring to slow down the growth. Unfortunately, we are not yet allowed to use these sprays in California.

High density 'Hass' trials in California

I first became aware of two trials on high density plots with 'Hass' in 2011. One grower in Temecula had produced 32,727 pounds per acre in the sixth year. Another grower, in Escondido, produced 24,195 pounds per acre in the fifth year. But both groves had problems.

The Temecula grower called me because they had pruned in the summer after the big harvest and they had very little fruit set in the spring of the following year. Of course a lot of the problem was the inherent on/off cycle in avocados. However, in order to keep these trees in a high density situation without crowding, the grower had pruned in the summer after the harvest, removing most of the fruiting wood for the following spring.

The Escondido grove was not pruned at all. The grove was so in-



credibly crowded that the irrigator was complaining he couldn't get through the trees to check the sprinklers.

Both growers needed a good plan for maintaining the spacing and the high production of fruit every year.

I proposed to the California Avocado Commission (CAC) at the end of 2011 that we set up a trial in San Diego County with a very simple goal: I wanted to produce the highest yield per acre possible for a 'Hass' and a 'Lamb Hass' grove. The spacing would be 10' x 10' with plenty of pollinizer trees (one 'Zutano' for every eight 'Hass' trees) and plenty of bees.

The trial part of this project would compare two simple pruning methods. The first method would be to prune all sides of each tree and top at 7' to 8' every year after harvest. This method would be somewhat similar to the Chilean idea of keeping the trees in a Christmas-tree-like shape. The second method would be something new. We would prune the southwest side of the trees the first year, the northeast side of the trees in the second year and the top in the third year. The rotation would start over in the fourth year. This second pruning method has several advan-

tages:

- It is easy to teach to grove workers.
- It leaves all of the fruiting wood on two-thirds of each tree every year.
- It keeps trees properly spaced and with a proper height.

We would also record our irrigation use and our labor so we could create a cost analysis at the end of the trial.

CAC liked this idea and they funded the trial, along with new grower education classes, in 2012. The trial was planted on 'Dusa' rootstocks in the late summer of 2012. We have been attempting to train the trees to a single leader and the main part of the pruning trial will start in 2015. All of the trees are growing well and set a heavy crop in the spring of 2014. As our research progresses, we will keep growers informed of our findings.

High density plantings may be one solution to a really serious problem in San Diego County — and for that matter, for all California avocado growers. But growers must continue good farming practices such as a complete leaf analysis each year along with proper irrigation scheduling and pest inspections in order to be successful. 🥑

Short Crop Leads to Strong Market

There is no doubt about it, the California avocado crop is very short this year compared to the last two years and that has led to a very good f.o.b. marketing situation...maybe even better than one might think.

"The market price at the handler level is very good," said Steve Taft, president of Eco Farms Avocados Inc., Temecula, CA. "Anytime 84s are over \$20, you know you have a good market."

In early June, he told *From the Grove* that the market ranged from about \$23 for 84s to \$40 for a carton of 48 size fruit. "The psychology of the market is playing a big role," he added.

Taft explained that for the last week of May, 43 million pounds of avocados were available for sale in the United States. That's a substantial volume which, on an annual basis, equates to a 2.2 billion pound crop. At such a substantial volume, you might not expect a strong market for any fruit, yet the California avocado market was holding its price. "The California crop is short. Buyers know that and so the market is good. It's the psychology of a shortage," he said, "even though on the world market there is lots of fruit."

Given the two different heat waves that took their toll in May, the Eco Farms executive said this year's crop is playing out fairly well. "At the handler level, we felt that pain in May," he said, referring to a lot of fruit drop. "That made for a tougher deal and a couple of tough weeks."

But Taft said the situation improved for June and as he spoke, he said California was moving into its peak shipping period. "We are peaking right now," he said on June 4.

He added that June and July should have good volume but supplies will taper off in August and there won't be much fruit available for shipping in September, even from the most northern districts. "I know there are some guys in Morro Bay that just couldn't keep the fruit on the trees because of the water situation. They were stripping their trees early."

Rob Wedin, vice president of fresh sales and marketing for Calavo Growers Inc., Santa Paula, CA, concurred that the market was strong and f.o.b. prices were very good. "For us, June and July will be our best months and then we will be 20 percent off in August. In September, we will only have one-third of the amount of fruit that we will have in August."

Wedin had heard of the trouble of some northern district growers, but he said Calavo's October shipments should be on target. "We are projecting fruit for October. It will be less than 5 percent of our total, but we will have fruit."

The Calavo representative said the field price currently being paid for avocados, especially organic avocados, was very good, though it might not be living up to early expectations. When the industry got wind of the short crop, Wedin said there was talk of a very strong in-the-grove price that could approach

\$2 per pound for conventional fruit. He said that talk was more idle speculation than anything else and didn't take into account supplies from other regions of the world. While some thought Mexico would be down during the summer months, in reality Wedin said our neighbors to the south sent a good supply of avocados to the United States market over the past several months, and there is not a lack of supplies from there moving forward.

"Expectations were really high but a little unrealistic," he said.

Still the California market has done very well. In early June, Wedin said the field price being paid for organic avocados on that day was \$1.99 per pound while conventional fruit was fetching \$1.44 per pound. He called both numbers "very good."

A representative from Cal Flavor in Escondido had a very similar story as the other two handlers to share. He said the market was strong, especially on small fruit, but he expected a little bit of a drop in price in the coming weeks as volume from Peru ramps up. Cal Flavor expects to have good volume of California fruit through the end of August with shipments concluding sometime around the middle of September.

Early in the season, most observers were pegging the total California crop at around the 300 million pound level. A mid-season survey now estimates that the crop will be around the 315 million pound figure (see story on page 10). "We believe the first figure might be closer to ac-

By Ken Melban
Director, Issues Management

curate,” said Wedin.

However, Taft said there are indications that a higher number might materialize. “It’s hard to say but the way the crop is picking, there could be more volume out there (than first predicted).”

Good prices always tend to bring out volume and more fruit may materialize if the market stays strong says conventional wisdom.

Wedin believes growers should not sit on their fruit and wait for short supplies and a potentially higher grove price. He said Peru has a good crop of large fruit and as the fruit sits on the tree and sizes it will come up against some tough market competition. In addition, the Lamb Hass fruit that come off in July will be large. And Mexico’s off bloom crop is also looking to be fairly strong as the summer progresses.

“We believe growers should harvest some of those profits now,” Wedin said, adding that the movement on smaller fruit at retail has been very good.

Also waiting in the wings is the petition from growers in the Mexican state of Jalisco to be approved for shipping to the United States. “We are hearing that Jalisco will be approved soon,” said Wedin, echoing what many are saying. “By the beginning of the year, they could be impacting supplies.”

Wedin said in early June that the Calavo fieldmen are saying it’s a bit early to say anything definitive about the 2015 crop. There appears to be a good crop on the trees but the triple digit weather in May could have an impact. “The 2015 crop looked very good but then it got very hot and the people I am asking say they need a little more time to see what’s going to happen.”

In general, Wedin said it’s a great time to be involved in the avocado business. “Avocados are increasing their popularity every year. It’s great fun. It’s all positive.” 🥑

Drought Impacts Feared

As the drought continues, avocado growers across all production areas are feeling the impact.

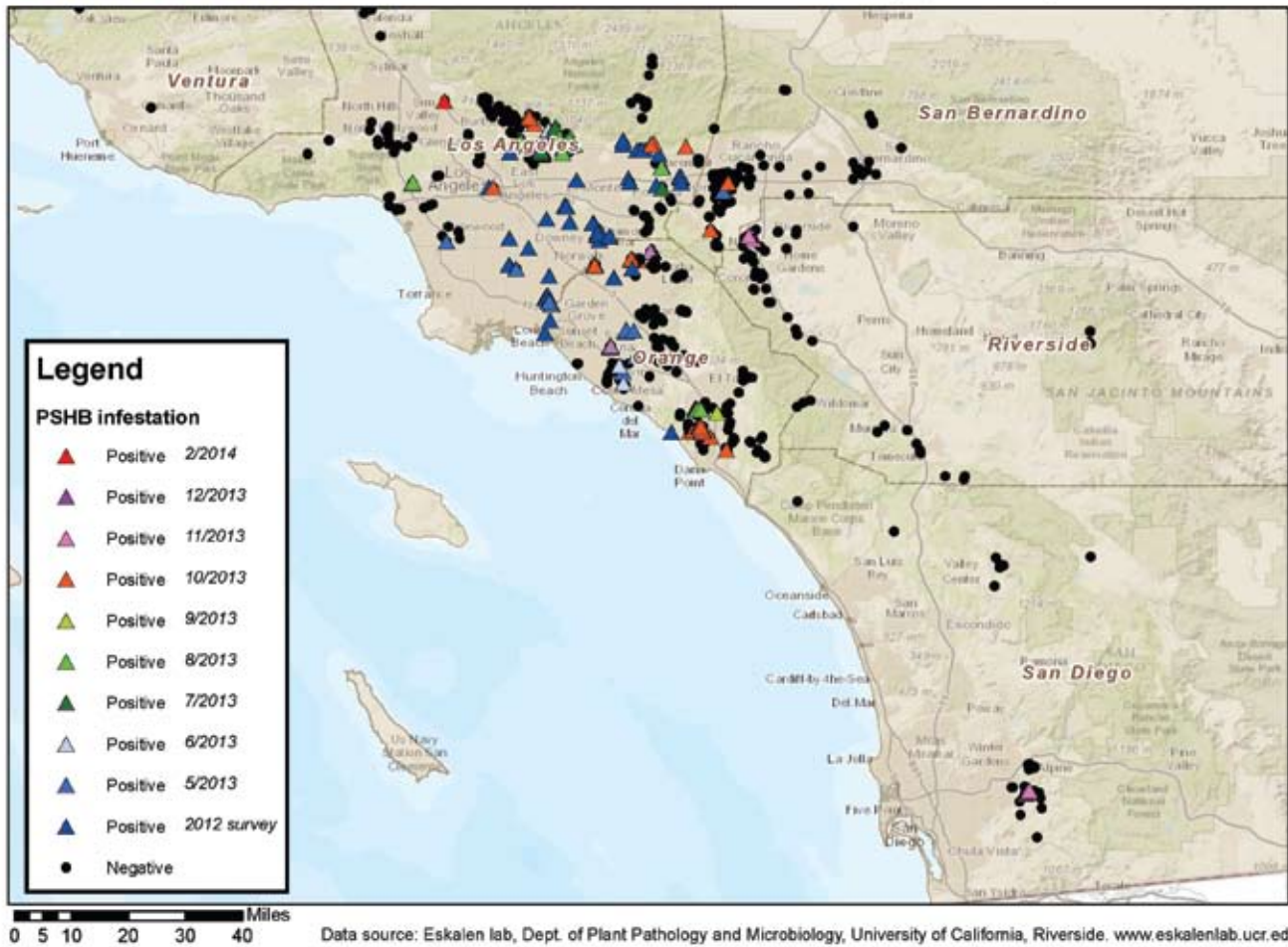
In the Morro Bay region, many farmers are seeing their groundwater supplies severely depleted, and with no relief in sight many are being forced to harvest early. With increasing demand on the groundwater in Ventura County, the aquifers have seen diminishing levels and growers are grappling with how to allocate the existing supplies. In the south — while there is agency water available — it remains costly. Due to the lack of rainfall, southern region growers have had to increase water purchases or allow groves to remain under-irrigated. In the near term, if these drought conditions continue, growers within the Metropolitan Water District service area could likely face mandatory cutbacks on deliveries.

Over the last few weeks the National Oceanic and Atmospheric Administration (NOAA) has been forecasting a possible El Niño event for later this year, which may bring some much needed rainfall, although the two don’t necessarily coincide. As of this writing, Congress is working on drought relief legislation intended to cut red tape and increase operational flexibility for federal agencies, but it is unlikely it will lead to any easing of federal laws and regulations, included under the Endangered Species Act or the Clean Water Act. At best it may increase deliveries from

the State Water Project allocations, and possibly allow additional water transfers from Lake Powell into Lake Mead. Either of these actions could result in improved supplies for Metropolitan, which may delay any call for mandatory cutbacks. The California Avocado Commission remains committed on our Water Pricing Campaign with Metropolitan, but it has definitely been made even more difficult due to the drought emergency (read more about CAC’s Water Pricing Campaign in the Spring 2014 *From the Grove* issue).

TSAWR Update for San Diego County

In 2012, the Commission successfully negotiated an extension of the Transitional Special Agricultural Water Rate (TSAWR) with the San Diego County Water Authority (SDCWA) for a savings of \$283 per acre foot for agricultural rate payers. The current agreement is set to drop the TSAWR supply costs component of \$139 per acre foot on January 1, 2015. Commission representatives have been meeting with SDCWA staff and presenting before the SDCWA Administrative and Finance Committee over the last few months, and there seems to be support to extend the TSAWR “as is” through January 2016. The Commission will continue to work with the SDCWA board and staff to maintain the TSAWR. 🥑



Polyphagous Shot Hole Borer and Fusarium Dieback Update

By Tim Spann
Research Project Manager

In the last issue of *From the Grove* a polyphagous shot hole borer (PSHB) find in a southern Orange County avocado grove was reported. Further testing of samples from the attacked tree did not detect the *Fusarium* fungus associated with PSHB, indicating that this was not a PSHB find. Most likely the tree was attacked by one of a number of bark beetles present in California, which feed on dead and dying trees.

This false positive only helps to reinforce how important it is for growers to monitor for any signs of this pest and contact your pest control advisor (PCA) or Dr. Akif Eskalen's

lab for confirmation and not to rely solely on visual symptoms. To date, the only known commercial grove affected by PSHB remains the small organic grove in the Azusa area.

Also in the last issue we had just learned about a suspected PSHB find in Santa Cruz County. To date no additional specimens have been found in that area and the one specimen that was found has only been identified based on physical characteristics. Until additional specimens are found, genetic testing cannot be conducted to definitively prove that the Santa Cruz find is PSHB and not the physically identical tea shot hole borer.

PSHB Meeting with CDFA

Staff at the California Avocado Commission (CAC) has been working for the past several months to coordinate a meeting with officials from the California Department of Food and Agriculture (CDFA) and various stakeholder groups currently or potentially affected by PSHB. The meeting was held on Tuesday, May 27, and the outcomes of it will be covered in a future issue of *From the Grove*. The goal of the meeting was to engage with the numerous other stakeholders (e.g., nurserymen and landscapers; forest service; other agricultural commodities; city, state and national parks) and establish a PSHB working group or taskforce. This working group will then be tasked with coordinating outreach and education efforts so that a unified and consistent message is put out, and to identify research priorities and find potential funding sources.

There are currently numerous issues of high importance facing California's agricultural commodities and allied industries and CAC is grateful to CDFA Secretary Karen Ross and her staff for helping us to coordinate this effort. We believe this will be a tremendous help in the fight against PSHB.

Infested Area Did Not Expand in Spring

Since the last PSHB survey map was produced in December the infested area has not expanded. The most recent distribution map from April 2014 shows that a significant area of eastern Orange County and western Riverside and San Bernardino counties have been surveyed with no new positive finds. In addition, extensive surveying around the El Cajon find, including nearby commercial groves, in San Diego County has not uncovered any spread beyond the Sycuan Golf and Tennis Resort.

Although the outer boundary of the infested area has not expanded, the beetle and pathogen continue to spread within the infested area. CAC-funded surveying is primarily focused on monitoring the boundaries of the infestation, particularly in areas near commercial avocado groves, so we do not have good data on how many new trees are being attacked within the infested area. The abundance of PSHB host species in the southern California's urban forest is likely helping to slow the expansion of the overall infested area. However, once the host species in the infested area have been exhausted there may be in-

creased pressure on avocado groves near the infestation perimeter.

For now, the lack of spread is good news for California's avocado industry in a year already full of challenges: drought and early-season heat and winds. However, growers in Los Angeles, Orange, San Diego, Riverside and San Bernardino counties need to continue to be vigilant. CAC has worked closely with University of California (UC) Riverside researchers to update information sheets (in English and Spanish) and these can be downloaded at www.CaliforniaAvocadoGrowers.com or from Dr. Akif Eskalen's website (<http://eskalenlab.ucr.edu/>). Hard copies can also be obtained by contacting CAC or Akif.

As a reminder, if you suspect that PSHB may be attacking your trees please contact your PCA or Akif Eskalen (951-827-3499 or akif.eskalen@ucr.edu) immediately. 🥑

UC New invasive beetle/disease complex on California avocado and landscape trees: **Polyphagous Shot Hole Borer (*Euwallacea* sp.) and Fusarium dieback (*Fusarium euwallaceae*)**
Akif Eskalen (PhD), Department of Plant Pathology and Microbiology, University of California, Riverside www.eskalenlab.ucr.edu

Status: Recently a new beetle/fungal complex was detected on avocado and other host plants in Los Angeles, Orange and San Bernardino Counties. The two fungal species are *Fusarium euwallaceae* and *Graphium* sp., which form a symbiotic relationship with a recently discovered beetle that is commonly known as the polyphagous shot hole borer (PSHB, *Euwallacea* sp.) (Fig. A). Together, they cause the disease Fusarium dieback (FD). When the beetle burrows into the tree, it inoculates the host plant with the fungus (Fig. D), which is carried in its mouthparts in a structure called mycangia. The fungus attacks the vascular tissue of the tree, blocking the transport of water and nutrients from the roots to the rest of the tree, and eventually causing branch dieback. The beetle larvae live in galleries within the tree and feed on the fungus. FD has been observed on more than 110 different plant species in California, including many species common in urban landscapes and on such agriculturally important species as avocado, olive and persimmon.

Symptoms: Each host species shows different symptoms depending on the response to infection. Sycamore, box elder, maple, red willow, and castor bean are good trees to search for signs and symptoms of the beetle, as it tends to prefer to infest these hosts first. Depending on the tree species attacked, PSHB injury can be identified either by staining, gumming, or a white-sugar exudate on the outer bark in association with a single beetle entry hole.

The beetle: An exotic ambrosia beetle (*Euwallacea* sp.) is very small and hard to see. At the advanced stage of infestation, there are often many entry/exit holes on the tree (Fig. E-F). Females are black and about 1.8 – 2.5 mm (0.07-0.1 inch) long (Fig. A-B (right)); males are brown colored and about 1.5 mm (0.05 inch) long (Fig. B (left)). The entry/exit hole is about 0.85 mm (0.033 inch).

Known Hosts: The following is a selective list from over 110 hosts: Box elder (*Acer negundo*), castor bean (*Ricinus communis*), avocado (*Persea americana*), coast live oak (*Quercus agrifolia*), English oak (*Q. robur*), valley oak (*Q. lobata*), California sycamore (*Platanus racemosa*), big leaf maple (*Acer macrophyllum*), Japanese maple (*A. palmatum*), red willow (*Salix laevigata*), goldenrain (*Koeleruteria paniculata*), olive (*Olea europaea*), persimmon (*Diospyros* sp.), silk tree (*Albizia julibrissin*), American sweet gum (*Liquidambar styraciflua*), coral tree (*Erythrina corallodendron*), weeping willow (*Salix babylonica*), blue palo verde (*Parkinsonia florida*), palo verde (*Parkinsonia floridum*), tortuosa (*Salix matsudana*), white alder (*Alnus rhombifolia*).

What to do:
-Look for a single entry/exit hole surrounded by wet discoloration of the outer bark
-Scrape off the bark layer around the infected area to look for brown discolored necrosis caused by the fungus.
-Follow the gallery to look for the beetle (may or may not be present).
-Avoid movement of infested firewood and chipping material out of infested area.
-Look for other hosts (Castor bean, sycamore, maple, coast live oak, goldenrain, liquidambar) showing symptoms of the beetle/disease.
-Sterilize tools to prevent to spread of the disease with either 25% household bleach, Lysol® cleaning solution, or 70% ethyl alcohol.

Who to contact if you find the problem:
If you suspect that you have found this beetle or seen symptoms of the Fusarium dieback on your tree please contact either your local farm advisor, pest control advisor, county Ag Commissioner office or Dr. Akif Eskalen by either phone 951-827-3499 or email at akif.eskalen@ucr.edu. For more information visit www.eskalenlab.ucr.edu.



By Tim Linden

Hawaii Gains Limited Access to Mainland Market

Last fall, the Animal Plant Health Inspection Services (APHIS) of the United States Department of Agriculture (USDA) approved a protocol framework for the shipping of Sharwil avocados to 32 states during the November-March time frame. Representatives of the Hawaiian industry and APHIS worked out an implementation agreement by early April of this year, and there is every expectation that some fruit will be shipped later this year.

"It's going to start very slow," said grower Tom Benton, who is also the president of the Hawaii Avocado Association. "California doesn't have to worry about us for a long time."

Benton said Hawaii produces an average of about 1.5 million pounds of avocados annually with most harvested from October into May. Of course that number fluctuates as avocado groves in Hawaii follow a similar pattern to that of their California cousins with volume having the ability to fluctuate significantly from year to year.

Many decades ago, Hawaii did ship avocados to the mainland, and again in 1990/91 it had a two-year shipping window. At that time, the Sharwil was determined to not be a fruit fly host so shipments were allowed. Benton explained that eventually some fruit flies were found in dropped fruit and APHIS altered the shipment protocol. "APHIS did establish a cold treatment protocol but it wasn't viable and nobody used it."

For the past 15 years, Benton

and others have been petitioning APHIS to classify Sharwil avocados as a "poor host" for the fruit fly and establish an accompanying protocol. "They finally agreed last year."

Benton, who has been on the Hawaii Avocado Association board for 25 years and its president for most of the past decade, said the industry is excited about being able to ship to the mainland. The vast majority of avocados produced in the state are sold for consumption by residents and tourists in Oahu and Maui. But he said avocados from Mexico often offer a lower cost alternative and when Hawaii has a heavy production year, it is difficult to find a home for the entire production within the state. Some packer/shippers do send some fruit to Canada and Asia but sales are limited.

Based on his experience in shipping the Sharwil avocados to the mainland U.S. in 1990 and 1991, Benton is optimistic that he will find buyers for his Hawaiian avocados. "Back then Hass avocados were selling for \$25 per box and I was able to sell Sharwils for \$40. I believe there will be a gourmet market for the Sharwil."

He expects that the limited volume that will be shipped this year will be flown to the Mainland via air container. One hurdle to overcome is that very few of the larger planes that carry those LD3 containers fly in and out of the island of Hawaii, where most of the avocados are commercially grown.



Benton acknowledges that the advent of Mexico into the U.S. marketplace has changed the dynamic tremendously since the early 1990s, but he still believes there is a market for the Sharwil and because of limited volume initially he expects demand to exceed supply as Hawaiian shippers establish relationships with buyers. "It's an excellent piece of fruit with all the attributes people desire. It is super consistent with a small seed. It stays green, has nice shelf life and has an average size of a half-pound to a pound."

He said most growers in Hawaii are fairly small, averaging five acres or less. Benton said the largest avocado grove in Hawaii is about 50 acres. But there is available land and he expects some increased acreage if and when shipping to the mainland proves profitable. Most of the acreage is on Hawaii, near Kona and, according to Benton, relies on Mother Nature for irrigation. He said getting consistent rainfall is probably the number one cultural problem, with 6,000 pounds per acre being an average yield. 🥑



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GREG PHELAN
Avocado Grower

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