Spring 2012

# From the Grove

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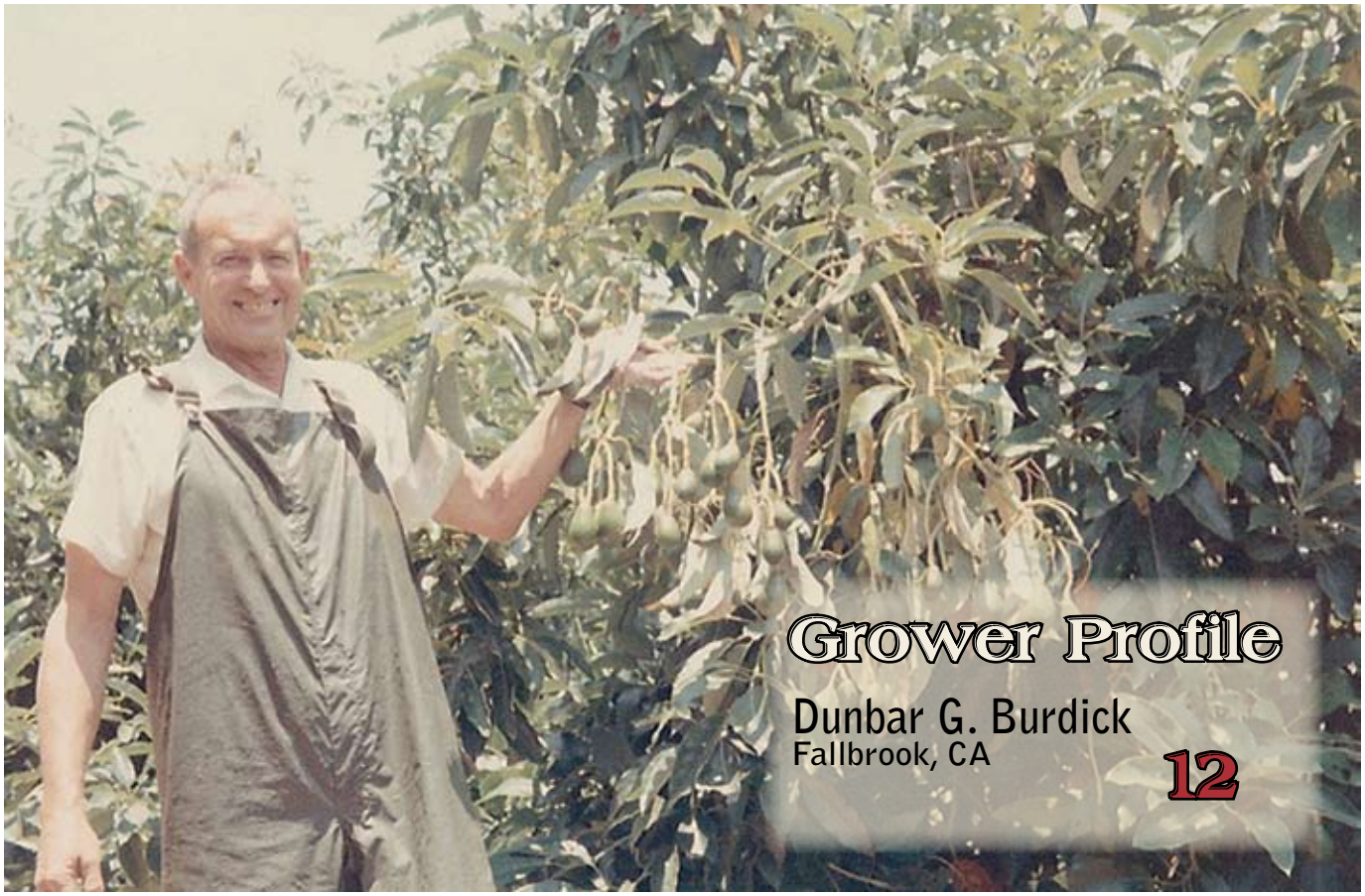


*From the* Grove

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# In This Issue

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## Departments





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# Message from the President

Tom Bellamore

# A Grove We Could Call Our Own

For the past year, the California Avocado Commission's Production Research Program has been getting quite a bit of attention.

It all began with the CAC Board's formulation of a strategy to guide its research investment as part of its long-term vision or *Strategy 2020 Plan*, which encompasses all of CAC's business activities. Next came a redesign of the process used to solicit, select, implement, and evaluate new research projects. It took some time to put the redesigned process in place, but the first projects coming through the new system indicate that it was time well spent. These projects are geared to deliver practical tools that a grower can use to improve cultural management and productivity.

The CAC Board and Production Research Committee aren't stopping there. Presently, they're taking an in-depth look at two of the most important categories of research: plant breeding/genetics and entomology. Again, the objective is to ensure that research undertaken in these critical disciplines is strategically-based, aligned with CAC's overall business goals and usable by growers. Watch for opportunities to have your views on these topics heard.

There are innovative ideas circulating about outreach activities, too. Many growers learn most effectively when they are shown how to do something. Take pruning, for example. There are several schools of thought about how and when to prune your trees. It's one thing to hear about pruning techniques when you're sitting in a classroom style seminar but quite another if you are watching someone actually prune a tree while they talk about tree structure and why they have chosen a particular limb for pruning. Field demonstrations are certainly part of the education growers receive through the combined efforts of the California Avocado Society, CAC and the Cooperative Extension Service.

In every case, however, a willing grower is needed. Or is one?

Grower cooperators have been central to the Commission's research effort since the first research investment was made. Typically a grower-cooperator will lend a section of a grove, for a finite period, to allow for experimentation and field trials. This has often worked very well, but it is a tricky relationship. CAC's reliance on the generosity of the grower means that, in the event of unforeseen circumstances, the grower may decide to terminate the field trial and cease being a cooperator. This introduces the possibility that projects may end prematurely or before they yield meaningful results. Even the South Coast Field Station, a University-owned facility which has long been the site of CAC's plant breeding activities, could face an uncertain future at the hand of encroaching urban development.

A potential solution may be one or more CAC owned or operated demonstration groves. Not a perfect answer by any means, but perhaps one that would ultimately give CAC greater control over its research and outreach effort. The idea is that CAC would make a long-term commitment to growing avocado trees, and using those trees for research, field trials, and field demonstrations, all for the benefit of the grower community and without need of permission by a private landowner. This could be accomplished through a long-term lease arrangement or direct ownership. A central test plot could be established or there could be smaller plots at two or three representative locations across the growing region.

The California avocado industry's production research program pre-dates the Commission and has been a core CAC activity for 30 plus years. The Commission Board and management believe that the industry has a long, bright future ahead, and that research will be integral to our progress and success.

Would a grove we could call our own accelerate that success? We'd like to know what you think.

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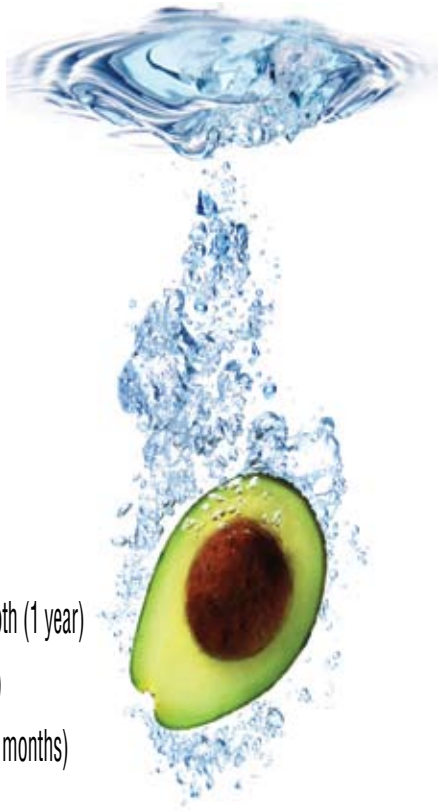

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# Chairman's Report

Ed McFadden

# Planning Our Future Now

On January 19, 2011, your CAC Board and an auditorium full of interested growers gathered to discuss and set long-term strategy for production research. A day-long session culminated in the crafting of a set of imperatives that we agreed would define and guide our future research needs.

The California Avocado Industry's five strategic imperatives:

- Increase average per-acre production
- Achieve and sustain critical industry mass
- Coordinate effective grower education
- Maintain a premium-quality product
- Establish a grower-driven research management system.

Please note that these imperatives are focused on efficiently bringing tools back to our groves to increase our yield of top-quality fruit from a grower-driven research program. We respect and require the input and skills of researchers, but our programs must be based first on the needs of California growers.

During the strategic meeting on that January day and in numerous gatherings, emails and conversations since, I have seen strong industry support for CAC-funded production research. In a recent meeting with UC Riverside Dean of Agricultural Sciences Marylynn Yates and UCR Divisional Dean Timothy Paine, CAC President Tom Bellamore and I expressed our long-term commitment to research with UCR as a partner, and discussed our strategic imperatives. Our industry has clearly stated that production research is an important part of CAC's mission.

For an excellent review of our current Production Research process I would refer you to CAC Research Program Director Dr. Jonathan Dixon's article in the Summer 2011 *From the Grove* titled "Technical Investment for Better Profits." (Check the CAC grower website, : CaliforniaAvocadoGrowers.com, to download past issues of *From the Grove.*) For a thorough review of our Production Research programs I would refer you to Dixon's article titled "Production Research Paying Dividends" in the Winter 2011 edition of *From the Grove.*

Our plant breeding program has been an important part of our production research for decades. Dixon and the Production Research Committee (PRC) have been in the process of examining our breeding projects from a "30,000 foot" perspective. Your board and staff have received numerous emails and letters supporting our plant breeding program. I would ask growers to take this a step further and let your representatives know what specific goals you want to see us pursue in our scion and rootstock programs.

Do you want to fund the development of salt tolerant rootstocks, cold tolerant Hass, Hass-like "b" flower-type pollenizers, early bearing "super Hass", a "better than Hass" new variety? Whatever it is, let your commissioner know! Send your ideas and specific needs to the CAC staff, board or PRC. This must be our program based on our strategies and goals and your input is important.

Your Production Research Committee and several board members met with researchers and Dr. Dixon at the CAC offices and the South Coast Field Station this past January to learn more about our breeding programs and new genetic tools. Some of these tools will allow researchers to more efficiently screen test plants for desirable characteristics. Others have the potential to create new varieties with special traits. We do need to understand that all tree crop varieties take time to develop; even with advanced genetic tools it will take 12-15 years to bring a new variety to our groves.

Many questions remain. Will the avocado market change as much in the next 20 years as it has in the past 20? How can we take advantage of other avocado breeding and genetics programs in the United States and the rest of the world? Will genetically-modified avocados be accepted in the U.S. market?

Not long ago Hass was not the dominant variety that it is today. My father and grandfather planted and preferred the Fuerte variety prior to

the 1970s. What will the avocado market be looking for in 15 years? Can we be profitable and will there be a market for selling varieties other than Hass? Should a multi-variety market be one of our goals? How do we deal with growers like me who find it difficult to plant new varieties that have potential but are not currently as profitable as Hass?

PRC Chair Shane Tucker and his team and our CAC staff are working on an integrated approach to our plant breeding; considering and including the grower and handler community, the UC system (ie making sure that a clear process for obtaining and releasing the patent quickly is in place before we spend many years developing the variety) and a strategy about commercialization once an attractive new variety is released.

As we review each of our assessment-sponsored research programs we need to ask:

- How much have we spent?
- What have we learned; what do we have to show for our investment?
- How does current or proposed research fit into our strategic priorities?
- How much will future research cost?
- What can we expect to gain and at what risk?
- When can we expect to see the results of our research delivered to our groves?
- Who will the results of our research benefit?

These questions are not meant as criticism for any part of our production research, but if asking these questions does not yield satisfactory answers then changes are needed. Questioning and openly examining all of our programs should be an ongoing part of how we manage our research programs. We and our CAC staff need to be able to ask any question of the programs funded by our assessment dollars. We need to look at our investments in research from a prudent, business-like perspective. All options must be considered, including increasing funding, reducing funding or elimination of programs that do not fit our strategic imperatives. Our research needs to be able to help keep us in business for the short term as well as have the potential to make profits for our children and their children, if that is our goal.

We also need to consider the fact that the majority of the California avocado trees currently planted will probably still be in place in 10-15 years. Our research must look both toward future plantings of new and improved varieties and rootstocks as well as maximize production and quality from the trees we are farming now.

Ask the hard questions, communicate with your commissioners and staff; let us join together as an industry to plan our future now.

# Tis the Season...

## California Avocado Season

By Jan DeLyser
*CAC Vice President of Marketing*

After many months of strategic planning, the start of the California avocado season is finally upon us, and CAC is ready to crank up its marketing engine. Consumer advertising, retail merchandising, foodservice promotion and public relations activities shaped by CAC's Marketing Advisory Committee and approved by the CAC Board are all poised to deliver a strong start to the 2012 season. By the time this magazine prints, CAC will have hit the road communicating the California avocado marketing program to retail and foodservice customers and momentum of harvest and shipments of California avocados will be building.

The CAC retail merchandisers met with many of the California handlers in early February to present the 2012 marketing campaign and discuss key account opportunities during the California season. Anticipation of this season is clearly exceptional.

Throughout social media, consumers are talking about how they anxiously await the arrival of California avocados and a consistently reliable eating experience. Calls on retailers and foodservice operators reflect a similar level of enthusiasm. And there are solid indicators that our messages are getting through to these audiences. At the trade level, competitive advantages and points of differentiation—such as freshness and proximity to market—are emphasized. At the consumer level, the message is one of consistent, reliable quality and taste. Both the message content and manner in which it is delivered, i.e. the media plan, are guided by robust and multi-faceted market research, which gives us insight into who our consumers are, how they behave, and where they spend their time on and offline.

This season, CAC's integrated marketing campaign will continue to build on the success of the California Avocado Grower Campaign with the Hand Grown in California theme. The consumer advertising, public relations, nutrition communications, online and social media, foodservice and retail programs are designed to work together synergistically to mark the arrival of California avocados and to create strong demand throughout the season.

*CAC's retail merchandising team*

This year's campaign steps up the messaging about the uniquely California attributes of California avocado growers and the fruit they grow, an example of which is the Hand Grown ad on the next page featuring Dan Pinkerton. California avocados will be featured in American Summer Holiday programs from Memorial Day to the Fourth of July and through Labor Day. The goal is to "own" these promotional opportunities, with recipes tailored for gatherings from mid-April through mid-September.

We're particularly excited about the potential for increased California avocado sales during the Fourth of July. CAC is contemplating making a long-term investment to grow demand during this mid-season holiday, with the goal of eventually having it eclipse Super Bowl as an avocado sales opportunity. Since the California avocado harvest is at its peak during July, it's only natural that California avocados become part of the celebration of nation's history. It is going to be great to see America put some Green in their American Red White and Blue festivities this year!


# IN ONE WAY or ANOTHER

## Dan never stopped SERVING HIS COUNTRY.

A military man for many years, Dan Pinkerton dedicated his life to the country he loves. So naturally, after completing his military service he longed for a new way to give back—little did he know he would find it in the hills of California. Armed with a good old fashioned 'can do' attitude, he and his wife purchased a hillside of lifeless sagebrush. Day by day, they tended, nurtured, and transformed their rugged land into a lush landscape teeming with creamy and delicious California Avocados. Today Dan is proud to say he now serves his country, one serving at a time.


HAND GROWN IN CALIFORNIA

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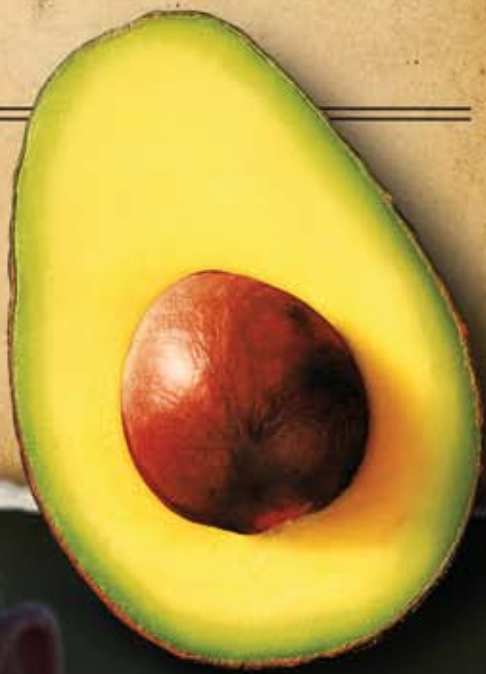

DAN PINKERTON
SANTA PAULA, CA

# The Importance of the Supermarket Registered Dietitian In Selling California Avocados

The Supermarket registered dietitian (RD) is a new and emerging target audience for the California Avocado Commission (CAC). They are hungry for nutrition information from credible resources to share with their customers. CAC's outreach and ongoing partnerships with this group adds another tool to our marketing kit and provides added synergy within our marketing programs.

## Integration at Retail

The National Grocers Association conducted a survey in 2010 which found that 77 percent of shoppers would like for their store to offer in-store dietitian services – and the supermarkets are responding. Over the past several years retail chains around the country have been adding RD's to their staffs to provide nutrition information services to their customers.

According to a recent article in *Supermarket News*' "Refresh" blog (Jan. 31 2012), Caroline Whitby, RD, joined Giant Eagle Supermarkets in 2008 as the Pittsburgh-based chain's first retail dietitian. Her task was to help the company develop and implement a comprehensive wellness strategy that included hiring and deploying nutrition experts throughout their market area. The article reports that the chain currently has 21 dietitians on staff, covering 26 stores. Whitby, who was quoted in the article, said, "The goal is to hire a total of 31 nutritionists who will be situated in such a way that a customer doesn't have to travel more than 15 minutes to get to a Giant Eagle store with a dietitian."

Retail chains of all sizes have introduced RD's at their stores including Shop-Rite, which employs 21 dietitians; Hy-Vee has an RD assigned to every store; Hannaford's RD team numbers 20-plus and Meijer employs an RD for each of its five regions.

## Supermarket RD Services

Supermarket RD's provide a valuable service and can contribute to customer loyalty. They help shoppers clear up confusion with food labels, decipher information pulled from the internet, create healthy alternatives to a favorite recipe and provide nutrition counseling, among other services. They also contribute articles and recipes to retailer magazines, newsletters, websites and blogs, post nutrition tips and ideas on social media and develop recipes that reach the customers at home.

In-store, they conduct culinary classes, demos, sampling and health events. And, in the nutrition community, they are frequently quoted in newspapers and appear as guests on radio and TV. Store-based dietitians are knowledgeable professionals that offer consumers an accessible "go to" for health and diet resources.

"Consumers look to their Supermarket RD to provide usage ideas and nutrition information in-store," said Jan DeLyser, CAC's vice president of marketing, "and we appreciate the opportunity to connect with the RD and provide this information so they are equipped with the right tools to educate their customers about the nutritional benefits of California avocados."

## Event Networking

CAC has a long standing relationship with Oldways, an internationally-respected non-profit organization that encourages people to eat better through practical and positive programs. Oldways is best known for developing consumer-friendly health-promotion tools, including the Whole Grain Stamp and the well-known Mediterranean Diet Pyramid. In 2011, CAC sponsored the Oldways Supermarket Registered Dietitian Symposium, an event that brings together leaders in supermarket health and wellness. The Symposium provided a forum to interact with 45 top supermarket RD's in group and one-on-one settings. At last year's event, DeLyser discussed opportunities the RD's have to work with their produce personnel to maximize nutrition messaging for fruits and vegetables. Sample California avocado nutrition materials highlighting nutritional benefits, recipes and usage/handling tips were distributed to attendees.

"Ongoing partnerships with groups like Oldways and

attendance at events like the Oldways Supermarket Registered Dietitian Symposium in addition to the Academy of Nutrition and Dietetics Food and Nutrition Conference and Expo are imperative to the success of building relationships with the RD's," said DeLyser "and many of these relationships have created beneficial opportunities for California avocados."

CAC sponsored the Oldways Supermarket Registered Dietitian Symposium again in 2012. This year CAC featured Chef Hugh Acheson in a cooking presentation called "Make Your Cooking Demo Sizzle." The restaurant owner, cookbook author and celebrity chef showcased the versatility of California avocados with his recipe for Roasted Pork Tenderloin with Bok Choy, Pickled Tomatoes and Avocado, and shared tips for presenting information in ways that are both educational and engaging.

*(Left) Barbara Ruhs, Bashas' RD and Oldways Symposium co-coordinator with Jan DeLyser, CAC vice president of marketing*

*CAC Marketing Manager Angela Fraser with Supermarket RD's at the Oldways Symposium*

*CAC Artisan Chef Hugh Acheson gives RD's demo tips while preparing Roasted Pork Tenderloin with Bok Choy, Pickled Tomatoes and Avocado*

## Online Messaging

To provide RD's with key information about California avocados in an online "news you can use" format, CAC developed a special Supermarket RD Nutrition Newsletter. Now in its second year, the California Avocado Supermarket RD Nutrition Newsletter reaches more than 175 Supermarket RD's. Seven newsletters will be distributed in 2012 filled with timely information about California avocado growers, nutrition information, recipes and photos for use in their communications outreach. The past Supermarket RD newsletters are archived online and are available at CaliforniaAvocado.com/supermarket-rds.

## Third-party Endorsements

Working with the Supermarket RD's is another way that CAC supports sales at retail while simultaneously reaching consumers at point of purchase. Their third-party endorsement of California avocados when in season as a nutritious and versatile addition to their grocery cart is a win-win-win for CAC, the retailer and the consumer.


*The first issue of the long-lead 2012 Supermarket RD Nutrition Newsletter was distributed in January*

Grower Profile

# Driven by Data,

## Burdick Leaves Important Legacy

By Tim Linden

Virtually every day for more than 30 years, Fallbrook grower Dunbar Burdick, who died in 1991, would end his day, after working his grove, by holing up in his office and taking meticulous notes.

He'd note the stress the trees were under, and the amount of rain or irrigation water each received, plotting water flow and power on the ubiquitous graph paper that was part of his routine. He would note any disease or abnormality, and took a very detailed look at root rot as well as the recommendations of research experts on that subject. If it was harvest season, he'd carefully chart the production from each tree as well as the labor needed to harvest the crop – year by year, tree by tree. His books were full of maps of each acre, including every tree and the history of that tree…when it was planted, topped and pulled.

"There are more charts and notes than you can imagine," says daughter Anne Burdick. "I can't do it justice just by talking about it. It is his life's work."

*Dunbar, his wife Janet, son Bruce, and daughter Susan shown in 1963 with young trees in the background. (Not shown, daughter Anne, who was away in the Peace Corps in West Africa.)*

Dunbar Burdick was born in Fargo, North Dakota, in 1909, the youngest of three children. His family moved to Oregon by buckboard in 1910, where his father founded a couple of banks and also served as mayor of a couple of different towns.

Burdick began his college career at the University of Oregon in 1927, but eventually was appointed to the U.S. Naval Academy and graduated in 1932 in naval science and mechanical, electrical and steam engineering. His first job was with the Federal Public Works Administration in San Francisco, as a special agent-engineer in construction of buildings, roads, bridges, dams and waterworks through much of the 1930s. Soon thereafter he got into the bur-

geoning aerospace industry where he spent the rest of his career, retiring from Aerojet-General Corporation in 1963 at the age of 54.

But long before his retirement, he began to plan for his "second career." Daughter Anne said through most of his childhood, her father lived a rural life and that always appealed to him. He liked the idea of agriculture, though she said you wouldn't have gotten that sense while he was fully ensconced in his aerospace career. "He really wasn't one to spend time in the garden, but sometime in the late 1940s or very early in the 1950s, he did plant five baby avocado trees in our backyard."

*Dunbar G. Burdick*

Anne wasn't particularly aware of it, but her father's passion for the avocado industry was taking root. He no doubt began researching the idea and in 1954, he purchased an 18 acre piece of land in Fallbrook, and started to plot his retirement. Most weekends he made the trip south from the family home in Los Angeles County and worked on the ranch. In May of 1959, Mr. Burdick's detailed notes show that he planted his first 992 trees. In March of the following year, another 487 trees were put into the ground. Over the next several years, he added 26 more trees to fill in the gaps. By the end of the 1960s, his notes show that the growth of the trees required that he thin the crop and he did, taking notes as he went. Initially, Burdick planted the Fuerte variety, which remained his favorite throughout his lifetime. Over the years, he did graft some of his trees to produce Hass fruit but the Fuerte remained his avocado of

## A Treasure to Be Shared

"When I saw what Dunbar Burdick had done over the years, I had to have those documents," said Jonathan Dixon of the California Avocado Commission. "We arranged to have every document scanned."

Dixon isn't exactly sure how these documents will be used now and in the future but he knows they are an invaluable treasure. "I am always trying to convince young growers to do a good job of keeping a record of what they do. This is the best example I have ever seen."

Dixon says it has value as both a historic reference and as a learning tool. Growers, he said, could look at how Mr. Burdick treated his grove, see the results in perfect chart and graph form, and develop their own cultural techniques based on the work. "He has mapped every tree and noted every change, every day for 10 different values."

While he believes it is of great value, Dixon stopped short of calling it a "recipe book for success." Instead, he said it is a record of everything that happens in a grove "and it is as relevant today as it was back then."

He said information such as the daily temperature and daily rainfall and how those factors affect soil moisture has much applicability.

Dixon said Burdick's work begins with a pre-purchase geological survey and continues through 30 years of growth. Soil moisture, yields and market price are just a few of the data kept every day, every year. "But more than that, his is the most complete record we have of root rot and how it spreads through a grove," Dixon said.

Though Dixon believes growers would be well served by keeping better records, he admits that Mr. Burdick was a bit extreme. "More than anything else his records reflect the real passion he had as an avocado grower. "

Burdick spent upwards of two hours a day making notes. Dixon said with today's computer programs, a grower could probably do a very adequate job of record-keeping in 10 minutes a day.

"What I would really like to know is are there any other growers out there with similar records? If so, please let us know."

choice and always dominated his groves.

After retiring in 1963, the Burdick family, which included 12-year old Bruce, moved fulltime to Fallbrook in the half-completed-house that they had built so that Dunbar could entertain his passion on a fulltime basis. "My sister and I were already out of the house by that time but I did initially move down to help my brother start school as my parents were making the move," said Anne.

And eventually Anne followed the family to Fallbrook where she spent a career in academia as both a high school teacher and college professor. Her father's move coincided with the development of his own mechanical engineering consulting company which afforded him the opportunity to transition easily into the grower he became over the next decade.

But Anne said that scientific training and discipline served him well and will now serve the industry. "I do think there is an engineering gene," she said. "So many of my friends who had engineer fathers or others in their families with engineer backgrounds have noted the same thing. Engineers make lists and charts. They are always keeping records and organizing things. It was something my father just loved to do. He was a scientist to the core. He figured if he had enough information, he would be a better farmer. Though it is counter to agriculture, he was keeping notes for the predictability of it."

*Dunbar driving his tractor with daughter Susan and granddaughter Rebecca in the trailer, set against young trees in full bloom. 1968.*

*Bruce Burdick with avocado wood - 1969. Between 1969 and 1972 the first stage of tree thinning occurred. Every alternate tree was removed, sawed for firewood and stacked. Bruce Burdick (19 years old) cut down, sawed and stacked 386 trees. (The second stage of tree thinning occurred between 1972 and 1977 with a professional grove service).*

And she believes it worked. "He was always one of the top producers in town with consistently high yields. He did well enough to live a good life on 18 acres," she said.

Nonetheless, Anne Burdick was amazed when she finally stuck her nose in those many boxes last year to see what was there. Near the end of his life in 1990, Anne's mom and dad realized that his health issues required them to move off the farm and into town. They sold their acreage and moved into a new house, bringing his boxes of records with them. After they both passed, Anne moved into the house complete with a garage full of boxes. "Last year I needed to clean out the garage and I started to go through those boxes. I was stunned. It took me three months of working every single day to organize and sort them out."

The result has been a mountain of information that has researchers drooling. "I thought they would have value to somebody, but I wasn't sure," she said.

She created as good a presentation as she could and went to the Fallbrook Historical Society with her find. "I was afraid they would say 'No!' so I put the information in an easily-accessible, nice display. The committee almost fell off their chairs and has made this information the centerpiece of their new museum. And Jonathan Dixon arranged for every document to be scanned so that they can be used by researchers and growers in this industry."

The local press picked up the story, which has given Anne Burdick the opportunity to discuss her father, his farming techniques and his penchant for detail with many new people in and out of the business. "It's the legacy he left behind and I am very happy it has been able to receive the light of day," she said.


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By Jonathan Dixon
CAC Research Program Director

# Irrigation Water Management

As of March 1, rainfall this winter is down by 30 to 50 percent of average precipitation for most avocado growing areas, according to the California Climate Data Archive (http://www.calclim.dri.edu/). Though late season storms are always possible, it appears as if this water year is going to be dryer than normal.

The lack of winter rain results in dry soils that will need to be augmented with irrigation. Water used for irrigation is one of the greater costs to California avocado growers and it is essential that the irrigation system is well maintained and is delivering the right amount of water to the trees to save money and produce the best crop.

A useful principle to use for irrigation is water according to need. To do this well, the grower or grove manager has to become familiar with the wetting and drying cycle of the soil in his grove. There must be a way to reliably measure the soil moisture and continually monitor it so that when trigger points on the instruments are reached irrigation can be utilized. The effectiveness of the irrigation on increasing soil moisture is then directly measured. The volume of water and the length of time the irrigation is run will vary according to the time of year, weather and nature of the trees. Through practical experience, the grove irrigation needs are established and over time a strong feel for the right amount of irrigation needed and when to irrigate is developed.

Measurement of soil moisture can vary from a basic direct hand feel of the soil to very automated electronic systems. Direct hand feel of the soil is not as reliable as using an instrument that is measuring the amount of water in the soil or how hard it is for the tree roots to extract the water. Many growers are familiar with tensiometers, which, when properly maintained, can be used to accurately schedule irrigation. Other systems use an electronic measurement of the soil moisture in real-time to allow the grower to directly track the impact of the irrigation on replenishing soil moisture. Direct soil moisture measurement can eliminate over or under irrigation.

The need to apply water varies throughout the year and season. For example, in times when strong Santa Ana winds are forecast, it is prudent to closely track the weather to make sure the trees have sufficient water to withstand that condition. There are a number of websites available that forecast the weather and track actual conditions.

In addition, there are commercial weather advisory services offered to growers. But remember every avocado grove is different which limits the precision with which the more general weather services can lead grove cultural management activity. Some avocado growers, particularly those with large acreage, should consider installing their own weather stations so that local conditions, like freezing temperatures, can be managed more closely. Again there are many choices for growers ranging in sophistication from simple pen and paper recording of the weather to computerized systems that offer cell phone alerts. No matter what system is used, the principle is the same, which is to be an informed grower so that appropriate action can be taken to best manage your investment.

All California avocado growers are also fortunate that they have access to a service that is designed to help them determine the need to apply water. The service is most commonly known as CIMIS, which stands for California Irrigation Management Information System. CIMIS is managed by the California Department of Water Resources and is free of charge. CIMIS acts as a central gathering point for the data collected from a large number of weather stations located all over the state. The data collected is processed to provide hourly and daily average evapotranspiration. This information, when combined with crop and landscape coefficients, can then be used to calculate the daily water needs of trees. From this data a water budget can be calculated for scheduling irrigation efficiently. CIMIS is a very valuable tool for growers and can be accessed at www.cimis.water.ca.gov.

Irrigation systems are made of many parts and require a lot of maintenance to run well. The lines and sprinklers or emitters need to be checked every time the irrigation system is turned on, and the pressure in the lines, filters and pumps also needs regular attention. To help conserve water, some water authorities run free programs that check the performance of the irrigation system and make recommendations.

One program that is available for growers in San Diego County

that has been in existence for more than 25 years is the Agricultural Water Management Program run by the Mission Resource Conservation District. The people managing the program are well educated about different soils and water as well as the intricacies of different irrigation systems. Very often they can help with recommendations for improving irrigation systems, and there may be financial assistance available for upgrading these systems. Many growers have used the service and growers are encouraged to request a retest after making changes to see the improvement in their irrigation system.

All growers are encouraged to contact their water district authority and ask if they have an agriculture water management or conservation program to help growers use water in a way that is targeted more closely to the trees' need for water so that valuable resource is not wasted. Programs in other counties can be found by searching for the county's resource conservation district services. The local Farm Bureau will also have contact details.

The UCCE farm advisors are also a very good source of information and advice, with Ben Faber based in Ventura County and Gary Bender based in San Diego County having a particular interest in irrigation and the proper use of irrigation systems.

The high cost of water means that frequent inspections of irrigation pipes and sprinklers for damage from animals or machinery could save money as well, making sure each tree gets the right amount of water.

Checking the irrigation system for leaks and sprinklers periodically for blockage and wear is a good practice. It is not difficult to measure the amount of water put out by a sprinkler or to check that the amount of pressure in a line is correct. With the salty water used by many growers, irrigation pipes can become clogged through the build-up of mineral deposits. Periodically flushing the irrigation lines with acid as well as constant attention to filters can be a useful preventative maintenance activity. There is a good basic description of what is needed in the UC ANR Integrated Pest Management for Avocados Publication 3503.

If this coming year is going to be very dry, paying close attention to irrigation and maintaining the irrigation system at high efficiency will be essential for a successful crop. Water prices are high making minimizing water waste a goal of any cultural management program. The high cost of water, however, should not be used as a reason to under apply water as this will put extra stress on the trees and could possibly have a longer adverse impact on the productivity of the trees.

Issues Watch

*by Ken Melban*
*CAC Director, Issues Management*

# CAC Advocates For Immigration Reform

As expected the first quarter of 2012 has been a flurry of activity for the CAC staff on issues that remain very important for California growers. The following is an update on some of the key issues Commission staff has been working on your behalf.

## Immigration Reform

In the last issue of *From the Grove*, we reported that House Judiciary Committee Chairman Lamar Smith (R) had introduced the Legal Workforce Act (HR 2885), which would mandate E-Verify nationwide. Although the E-Verify Bill was voted out of the House Judiciary Committee and sent to the Ways and Means Committee, every indication is Speaker John Boehner will not bring it to the House floor for a vote. In the short-term this is good news for California growers, but does not address the long-term situation.

The reality is that for decades the federal government has turned a blind-eye to undocumented immigrants, many of whom provide skilled labor for agriculture. To suggest that imposing new legislation in one fell-swoop will instantly correct this situation is both illogical and impractical. What is needed is immigration reform that addresses not only securing our borders, but also acknowledging our nation's reliance on immigrant workers. Some type of guest-worker program must be included that will allow the ongoing utilization of this important work force. Although many argue that "these undocumented workers are taking jobs from Americans," the facts paint a different picture. Last year, where states like Alabama and Georgia imposed their own E-Verify laws, immigrant farmworkers fled those states. As a result millions of dollars of fresh produce were left to rot in the fields.

The uncertainty surrounding immigration reform is having an impact in California and has led to a shortage of labor, making it more difficult to maintain a workforce. Recently United States Department of Agriculture Secretary Tom Vilsak made the following comments: "We should be deeply concerned with the ongoing stability of the workforce. We do not have the workforce to get the job done and everyone admits it is not functioning. We should be fixing it, and fixing it now," said Vilsak. He called on Congress to find the will to pass immigration reform.

At the beginning of March, I spent a few days in Washington, D.C., calling on congressional members and their staff. One of the issues discussed was the E-Verify legislation and the overall need for immigration reform. The level of divisiveness surrounding this issue is enormous. There are congressional members from agriculture districts that will not support E-Verify without an acceptable guest-worker program, yet others who are staunch proponents for its implementation. Member after member shared with me that the vast majority of constituents calling in favor increased immigration enforcement.

The CAC staff will remain engaged on this very important issue and provide you with periodic updates. It is important that you contact your local congressional member and communicate how critical the immigrant labor force is to your business. To contact your Representatives please utilize the following links: https://writerep.house.gov/writerep/welcome.shtml

**California Senators:**

Barbara Boxer (D-CA)
112 Hart Senate Office Building
Washington, DC 20510
(202) 224-3553
Web Form: www.boxer.senate.gov/en/contact/

Dianne Feinstein (D-CA)
331 Hart Senate Office Building
Washington DC 20510
(202) 224-3841
Web Form: www.feinstein.senate.gov/public/index.cfm/e-mail-me

## CAC-GAP Program

With the launch of the CAC-GAP program in full-swing, early indicators show a high level of interest from the industry and growers are moving forward in GAP certification in large numbers. At the end of February, CAC conducted three GAP workshops in Fallbrook, Santa Paula and San Luis Obispo. The workshops, funded by grant monies received through the Specialty Crop Block Grant Program, provided growers with a copy of the CAC-GAP manual and a detailed overview of the program, as well as educating them on what to expect during an actual GAP audit.

Each workshop presentation was simultaneously translated into Spanish and growers were engaged, asking quite a few questions. More than 25 percent of California avocado acreage was represented at the workshops, and as of this writing nearly 10 percent of all acres have been certified under the USDA GAP certification.

The Commission is continuing to work with growers and handlers in assisting the industry in moving forward toward GAP compliance. The Commission-funded GAP Incentive Rebate of up to $300 for actual costs of a GAP inspection is being utilized by growers who have been certified. Funds are limited, so growers are encouraged to consider becoming GAP certified as soon as possible.

More information on the CAC-GAP program and GAP rebate can be found here: CaliforniaAvocadoGrowers.com/GAP

## World Ag Expo

During February 14-16 the Commission participated in the World AG Expo (WAE) in Tulare, Calif. The World AG Expo is the largest farm show in the world with more than 100,000 attendees over the course of the three day event. CAC sponsored a booth that was hosted by staff and industry members.

*Bradley Miles, CAC Board member and Gene Nickel talk with WAE attendees*

The purpose was to increase Commission visibility in the Central Valley and engage potential growers with the idea of producing avocados. Currently there are a few growers in the Central Valley on roughly 400 acres. Several of those Central Valley growers helped staff the booth and were excited about the level of interest for growing avocados. In addition, growers from all over the state, including avocado growers, stopped by and were very complimentary regarding the presence of the Commission at the show.

The Commission has set a goal of maintaining critical mass in the total volume of California avocados sold in the United States. The necessary components to maintaining critical mass are increased yield per acre and increased acreage. If avocado varieties can be developed that are more resistant to the cold, the Central Valley is seen as an area where significant increases in production could be developed, due to the low costs of water and land, on terrain that allows easier harvesting.

## Uniconazole Registration

Commission staff is continuing to move forward in pursuit of a registration application on Uniconazole (Sunny). Uniconazole is a plant growth regulator that helps control canopy size and is used in other avocado producing countries.

Since CAC's meeting with the United States Environmental Protection Agency (USEPA) in October, a project request has been filed with the IR-4 program. IR-4 is a program designed to help specialty crops with registering materials by conducting residue trials.

The Commission continues to engage with companies who control the manufacture and distribution of Uniconazole, but thus far we've been unable to secure existing data from other international registrations that might be useful in an USEPA application. We are working hard to break through these obstacles. Once the Commission has received all the necessary information, a costs and benefits analysis will be conducted and a determination on whether to pursue registration will be made.

# MEET YOUR CAC STAFF

California Avocado Commission

## Tom Bellamore
**President**
*tbellamore@avocado.org*
*Years with CAC: 18*

As President, Tom leads the California Avocado Commission and the industry's 5,000 growers. He has supervisory oversight of all marketing and non-marketing functions and guides the Commission's strategic and financial planning, development of business plans and fiscal and personnel management.

## Jan DeLyser
**Vice President of Marketing**
*jdelyser@avocado.org*
*Years with CAC: 14*

As Vice President of Marketing, Jan is responsible for the managing the Commission's marketing and promotion agencies and implementation of all aspects of CAC's integrated marketing program. She represents CAC at a number of industry events and serves on boards and committees within the produce industry.

## April Aymami
**Industry Affairs Manager**
*aaymami@avocado.org*
*Years with CAC: 7*

April manages all of the industry's non-marketing programs, with key responsibilities related to governance, industry communications, budget planning and development, and grower outreach.

## Zachary Benedict
**Marketing Communications Specialist**
*zbenedict@avocado.org*
*Years with CAC: 7*

Zac's primary responsibility includes management of CAC's online and social media programs. He also handles marketing program communications for a variety of activities.

## David Cruz
**Marketing Development Manager**
*dcruz@avocado.org*
*Years with CAC: 21*

Dave serves as CAC's point person for both the Retail and Foodservice marketing programs. In addition he manages CAC's participation in a wide variety of industry festivals and events throughout the year.

## Jonathan Dixon
**Research Program Director**
*jdixon@avocado.org*
*Years with CAC: 2*

Jonathan serves in a senior management position overseeing all aspects of CAC's research program activities. Additionally he acts as an advisor to the Commission on research strategy and setting of industry priorities.

## Angela Fraser

**Marketing Manager**
*afraser@avocado.org*
*Years with CAC: 12*

Angela is the go-to person on CAC's Nutrition, Co-Marketing and Consumer marketing programs. She is responsible for CAC's participation at key produce events such as Produce Marketing Association's Fresh Summit and the American Dietetic Association Convention.

## Kathlyn Ho

**Accounting Clerk**
*kho@avocado.org*
*Years with CAC: 1*

As accounting clerk, Kathlyn handles accounts payable and receivables as well as assisting in front office administration.

## David Howald

**Retail Marketing Director**
*dhowald@avocado.org*
*Years with CAC: 20*

As Retail Marketing Director, Dave coordinates advertising, promotion and public relation activities featuring California avocados with key retail accounts on the West Coast.

## Stacia Kierulff

**Administrative Assistant/ HR**
*skierulff@avocado.org*
*Years with CAC: 2*

Stacia's primary responsibility is management of CAC's HR department including payroll and employee benefits. Additionally she assists Administration and Industry Affairs departments with planning meetings and working offsite industry events.

## Aria Lukman

**Finance and Accounting Manager**
*alukman@avocado.org*
*Years with CAC: 9*

Aria manages and directs the financial, accounting and administration activities of the Commission. He works closely with the Board Treasurer to ensure the integrity of CAC funds.

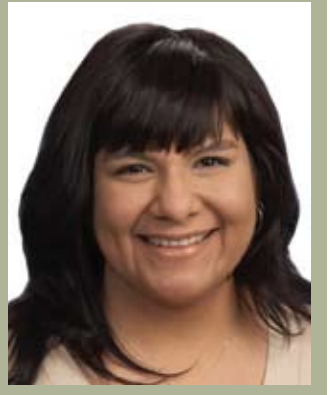
## Ken Melban

**Director, Issues Management**
*kmelban@avocado.org*
*Years with CAC: 1*

Ken manages and implements a wide variety of programs that address key industry issues such as GAP, water pricing, and product registrations as well as advocacy for California growers at a state and federal level with government officials.

## Cristina Wede

**Office Administrator**
*cwede@avocado.org*
*Years with CAC: 9*



Cristina is responsible for management of the front office activities at CAC including coordination of on and off-site meetings. In addition, Cristina acts as the first point of contact for grower and industry inquiries.

# Florida Breeding Program Bearing Fruit

## The South Florida Avocado Breeding Program at USDA-Agricultural Research Service Subtropical Horticultural Research Station (USDA-ARS SHRS)

*David Kuhn, Cecile Tondo, Barbie Freeman, Mike Winterstein, Don Livingstone, Tomas Ayala-Silva, Osman Gutierrez, Ray Schnell*

The USDA-Agricultural Research Service Subtropical Horticulture Research Station (USDA-ARS SHRS) is located on 200 acres in Miami, Fla. Established as a plant introduction station by plant explorer and USDA employee David Fairchild (also known for the Fairchild Tropical Botanic Garden in Miami) on an old Army air base in 1923, SHRS is a National Germplasm Repository for the USDA for tropical and sub-tropical plants. The diversity and number of accessions of the germplasm holdings for SHRS are shown in Table 1. In addition to maintaining the germplasm collections, our mission is to also identify and mine useful genetic diversity in the collections, to evaluate the accessions for agronomic traits when possible and to identify, develop and release improved varieties for commercial exploitation.

Avocado research at SHRS includes these maintenance, evaluation, and enhancement components, and embedded within these conservation and utilization areas are included the aspects of breeding and disease screening for Avocado Sunblotch viroid (ASBVd), Phytopthora Root Rot (PRR) and laurel wilt at an off-station site. Also we currently have the two largest families of avocado hybrids in the world for evaluation for avocado breeding, about 750 trees of 'Hass'-'Bacon' hybrids and about 750 trees of 'Simmonds'-'Tonnage' hybrids. Furthermore, we have developed a sensitive polymerase chain reaction (PCR)-based assay for ASBVd and investigated PRR resistant root stocks for South Florida growing conditions, which are much wetter than those of California.

Avocado (Persea americana) has been subdivided into three horticultural groups: Mexican (P. americana var. drymifolia (Schect. & Cham.) Blake), Guatemalan (P. americana var. guatemalensis Wms.) and West Indian (P. americana var. americana Mill.) races. The West Indian (WI) race is known to be from the lowland areas of the Pacific Coast of Central America and not the West Indies, while the Guatemalan (G) and Mexican (M) races are native to specific highland areas within each country. The three racial groups can be distinguished by the percentage of oil content in the fruit, with the WI cultivars ranging from 2.5-8.0 percent, G accessions from 10-13 percent, and the M accessions ranging from 15-20 percent. The racial classes also vary for phenotypic characters such as fruit size and shape, skin thickness, skin color, seed size, and fruit ripening. Sterility barriers do not exist between or among the three racial types. We have demonstrated that the three groups can also be distinguished using molecular genetic markers (DNA markers).

Worldwide production of avocado is about 1.4 million tons, with the majority (about one million tons) of the crop produced in Mexico, which is also the main consumer of the fruit. In the United States, California is the biggest producer (91 percent) with Florida (8 percent) and Hawaii (1 percent) accounting for smaller percentages of the yearly crop. Cultivation of avocado, like most tree crops, is by

vegetative propagation of commercially desirable cultivars. Almost all the cultivated avocado acreage in Mexico and California is the cultivar Hass (G). In Florida, WI and Guatemalan x West Indian hybrid (GWI) cultivars are better suited to the growing conditions. The majority of Florida grown avocados are of the cultivars Simmonds (WI), Choquette (GWI), Monroe (GWI), Lula (GWI), Nadir (GWI), and Booth (GWI).

An important goal of avocado breeding is to identify new, improved cultivars of avocado that can be supplied to growers to deal with environmental conditions, disease prevalence, or consumer taste. A common method that plant breeders use to generate such variability is to cross two cultivars with different desirable traits and then screen the progeny of that cross for trees that show differences either greater or lesser than both parents. An easy to understand example of this would be a family where the father was short, the mother was tall and several of the children were taller or shorter than either the mother or the father.

In tree breeding, because the generation time is so long (years), we would also like to have some way of telling at the seedling stage whether the progeny are going to be worth evaluating for a particular trait (e.g. reduced alternate bearing, increased oil content, disease resistance, salt tolerance). For this to happen, we need to associate some kind of a marker that is present at any age of the tree with the trait of interest. For the last number of years, Polymerase Chain Reaction (PCR) markers, based on nuclear DNA which is found in every cell in the plant throughout its lifespan, have been employed.

Ultimately, we would like to have a family of trees that are going to vary for important agronomic traits and a set of DNA markers that we can associate with the traits, then we can screen future crosses at the seedling stage for trees that should have the favorable traits. In this way, we can "stack" the favorable traits by looking for trees that have, for example, the markers for cold tolerance and salt tolerance and reduced alternate bearing. Now, instead of growing up and evaluating a thousand trees, many lacking some or all of the stacked traits, we can select at the seedling stage trees that are most likely to have all those traits and reduce the tree maintenance and evaluation costs. Screening the trees, even thousands of trees, with DNA markers at the seedling stage, is much less expensive than planting thousands of seedlings, maintaining them for years and evaluating them for more years. This process is called Marker-Assisted Selection (MAS).

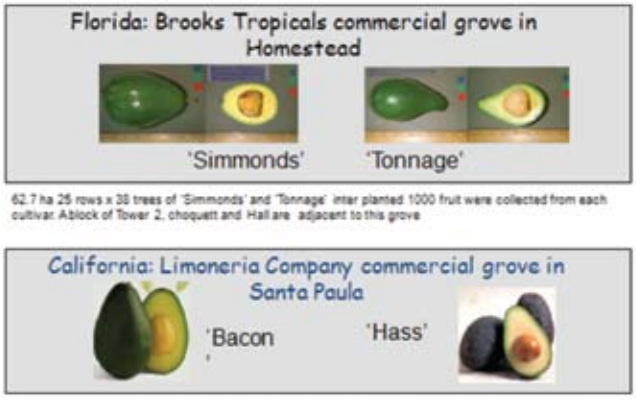
**Table 1**

| Name | Accessions |
|---|---|
| *Annona* spp. (sugar apple) | 26 |
| *Averrhoa carambola* (carambola) | 13 |
| *Cocos* spp. (coconut) | 20 |
| *Dimocarpus* spp. (longan) | 10 |
| *Ficus* spp. (tropical fig) | 115 |
| *Hevea* spp. (natural rubber) | 13 |
| *Litchi chinensis* (lychee) | 18 |
| *Mangifera* spp. (mango) | 316 |
| *Musa* spp. (banana/plantain) | 93 |
| Palmae (palms) | 411 |
| *Persea americana* (avocado) | 269 |
| *Psidium* spp. (guava) | 13 |
| *Saccharum* spp. (sugarcane) | ~1300 |
| *Theobroma cacao* (cacao) | 88 |
| *Tripsacum* spp. (corn relative) | ~200 |
| Ornamental | 2000 |
| Total | ~5000 |

The factors that most affect MAS are the size of the family that is being studied and the number of markers used to analyze (genotype) each tree. Human families are small, so it's hard to get a good statistical correlation between some trait (like eye color for example) and a DNA marker by studying only one family. But plant families can be very large, with hundreds or thousands of trees from the same two parents, which increases the statistical power of the association of a particular marker with a particular trait. In addition, the more markers you have, the better the chance you have to find a very high correlation between a particular trait and a particular marker.

Our goal is to create very large families of avocado trees varying for important traits that we will analyze with a large number of DNA markers to generate a highly significant association between DNA marker and trait. A way to visualize these associations is as a map of the plant's chromosomes showing where markers and traits are associated. Just like in a map website, one can zoom in on particular portions of the map. To be able to zoom in, we will need to have very large families and a large number of markers to analyze the trees in those families to give us the resolution we need to find the regions of the chromosomes associated with particular traits. The markers in those regions will be used in MAS to develop new cultivars for commercial release in South Florida.

**Figure 1** **Parents used to create mapping populations with contrasting phenotypes**




Because there are a limited number of cultivars that are grown in Florida and California, we wanted to evaluate a family made by crossing Florida cultivars (Simmonds [WI] and Tonnage [GWI]) and a family made by crossing California cultivars (Hass [G] and Bacon [M]) to look for interesting progeny that could be used to develop new commercial avocado cultivars. Hand pollination of avocados is difficult and fruit set from hand pollination is very low.

To circumvent this problem we employed a different strategy: buying fruit from commercial groves where only two varieties were being grown, one that produces the fruit and the other one serves as the pollinizer. Then, the seed from both producer and pollinizer trees is germinated, later the seedlings are genotyped and true hybrids are identified from self fertilized seeds using a small number of DNA markers.

We currently have planted at the USDA-ARS SHRS 750 'Simmonds'-'Tonnage' hybrids, 750 'Hass'-'Bacon' hybrids, as well as smaller numbers of self pollinated seedlings from each of the parents. To test the 'Hass'-'Bacon' hybrids for cold tolerance and laurel wilt reaction, 250 hybrids have been planted at the USDA-ARS Horticultural Research Laboratory in Fort Pierce, Fla., about 120 miles north of Miami. At both locations data on phenotypic characters for all the trees is currently being collected. The size of the families is about 10 times or more the size of families typically used to study trees, which should provide us with the resolution we need to associate traits with DNA markers.

Currently the Florida family population is showing differences for numerous phenotypic characters such as growth rate, cold tolerance, flowering time, fruit size and shape, fruit skin color and texture, leaf size, shape and color, and branch internode distance. So we have a large number of trees to evaluate and select for an avocado with improved characteristics, which we can then vegetatively reproduce for release as an improved cultivar. Since we have created both a California mapping population and a Florida mapping population, we may be able to identify improved varieties from both families that are adapted to Florida growing conditions and produce, for example, fruit with higher oil content and cold tolerance. In the future, budwood from potentially interesting trees from the California family could be made available for clone trials and evaluation under California growing conditions.

We initially made a genetic map of the Florida mapping population using 164 markers. This map had moderate resolution and allowed us to associate particular markers with traits like cold tolerance, canopy volume, trunk diameter, etc. (See Figure 2). To increase the resolution of the map, we decided to employ a different kind of marker, single nucleotide polymorphisms (SNP), as they occur in much greater number than the DNA markers we were using.

To develop SNP markers for avocado, we used RNA sequences. RNA is different than DNA in that it results from expression of a gene. RNA is copied (transcribed) from the gene DNA in the cell and is then translated into protein. 'Hass' RNA was used as the reference to compare

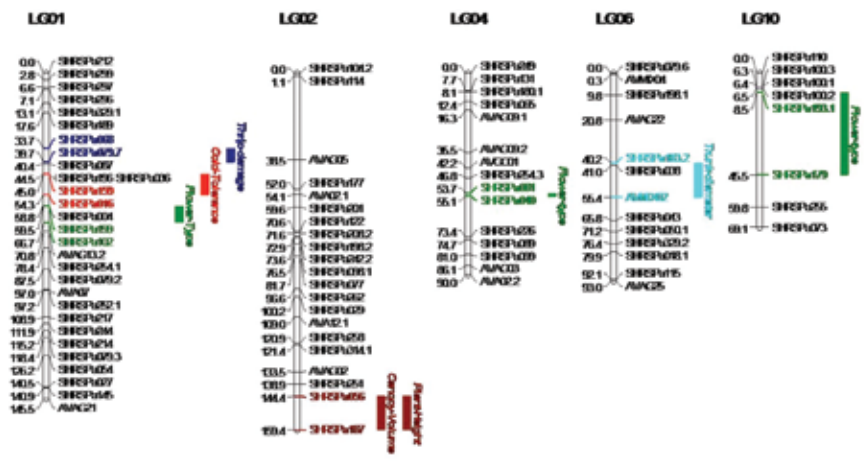



**Figure 2** **A portion of the genetic map made from the genotype data of the Florida Simmonds-Tonnage hybrids. SHRSPaxxx is the name of the DNA marker.**

RNA from 'Bacon', 'Simmonds' and 'Tonnage' and places where the sequences differed were identified as SNPs. The large number of SNPs identified were filtered and used to design a SNP "chip" with 6000 SNPs which will be used to genotype the progeny of the Florida and California mapping populations, as well as accessions in germplasm collections, in the next few months. The SNP chip will assay each tree for 6000 SNPs simultaneously, providing us with sufficient marker data to get a high resolution picture of the correlation between traits and markers. We will use the SNP chip to genotype trees in our germplasm collection and the germplasm collection at the University of California at Riverside. Because both collections show a great deal of trait variation, we hope to be able to associate particular SNP markers with interesting traits.

We are well on our way to accomplishing our goal to get a high resolution picture of how traits are associated to markers in avocado by creating two very large families and screening those families with markers that represent 6000 different genes of avocado. As we collect trait data on the two populations, we will be able to identify individual markers that can be used to screen new populations of avocado made from seed purchased from other commercial fields using different pairs of cultivars. We have already looked at some traits such as cold tolerance, thrip damage, canopy volume and plant height, using the small number of DNA markers we had available to us.

Our next goals are to continue to collect data from our populations, particularly on flowering time, alternate bearing, and oil content and composition and to associate these traits to particular molecular markers. We are also looking to create a third population of a cross between a Mexican cultivar and a West Indian cultivar so that we will have captured all the possible genetic diversity available for avocado.

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By Dr. Greg W. Douhan
Department of Plant Pathology and Microbiology
University of California

# Rootstock Breeding Program at UCR

Avocado is a significant and nutritious fruit crop grown in both the tropic and subtropical regions in many parts of the world.

Three botanical races of *P. americana* have been domesticated from their centers of origin; the Mexican, the Guatemalan race, and the West Indian race. Each race possesses distinct agronomic characteristics such as the shape, taste and color of fruit, timing and length of fruit set, cold hardiness, disease resistance, and salinity tolerance. However, cross fertility among and within the botanical races has led to extensive genetic variability within *P. americana* and many existing cultivars are racial hybrids, thus possessing variable characteristics. This extensive genetic variability is important because it potentially provides ample germplasm for breeders when developing rootstocks or scions with desirable characteristics.

*Phytophthora cinnamomi* Rand is a globally distributed soil-borne pathogen that can infect more than 3,000 plant species and is a significant problem in forestry, agricultural, and horticultural industries. *P. cinnamomi* is the causal agent of Phytophthora root rot (PRR) of avocado and is the most serious disease of avocado worldwide. The disease has actually eliminated commercial avocado production in many areas in Latin America and is the major limiting factor of production in Australia, South Africa, and California. The pathogen was first identified as causing PRR in avocado in Puerto Rico in 1928 and was eventually determined in 1942 to be responsible for a general decline of avocado trees in California that had been reported since the late1920s and 1930s. In California, PRR of avocado remains a significant disease problem and has been estimated to affect 60-75 percent of groves with losses of up to $40 million occurring annually.

The use of tolerant rootstocks to control Phytophthora root rot (PRR) of avocado has long been proposed as the ultimate method for managing the disease. Research on developing PRR-tolerant rootstocks has been a major focus of avocado research at The University of California Riverside (UCR) since the 1950s. George Zentmyer, UCR Plant Pathologist, was the first proponent of using rootstocks for disease control and he screened extensively for resistance within species of *Persea* and cultivars of *Persea americana* and discovered the 'Duke' cultivar.

Two seedlings from this cultivar, the 'Duke 6' and 'Duke 7', were found to be partially resistant to PRR and eventually 'Duke 7' became the first commercial rootstock released that was tolerant to *P. cinnamomi*. It was highly successful and was eventually used worldwide to combat PRR. Similar breeding programs were also established in Israel, South Africa, Canary Islands, Florida, and Australia based on Zentmyer's pioneering work.

Breeding for PRR has historically proceeded in a traditional fashion by inoculating avocado seedlings with *P. cinnamomi* under greenhouse conditions that have either been collected from seeds from specific breeding blocks or from seeds collected from additional sources where avocados are found, such as from Central America. Typically, seedlings are first inoculated with *P. cinnamomi* under greenhouse conditions to find lines that are tolerant, followed by extensive field-testing.

For example, in the UCR avocado rootstock-breeding program, plants are screened for up to two years in the greenhouse under heavy and continuous inoculum loads. The selected rootstock varieties that show tolerance to PRR after this initial two-year greenhouse screening are then clonally propagated and saved as advanced germplasm at the South Coast experimental field station in Irvine. The plants must be allowed to grow for at least several years until enough budwood can be collected to produce clonal rootstock trees.

When selections are finally chosen, it takes a full year to produce the trees and then they are eventually tested under California field conditions using 'Hass' as the scion in locations where *P. cinnamomi* is a problem. Therefore, from the initial seedling screening stage to being planted for the first time can take up to five years. The trees will then start to yield in three to four years and it


*The University of California South Coast Research and Extension Center in Irvine where selected rootstocks are clonally propagated and saved as advanced germplasm.*

takes many more years and locations to determine if the rootstocks are acceptable based on growth characteristics and yield.

In recent years, the UCR rootstock-breeding program has generated many advanced rootstock selections utilizing this strategy. There are currently more than 100 selections that have been greenhouse tested for PRR but less than half of them have been field-tested thus far.

In the early 1990s, the original pool of rootstocks to test came from only nine maternal parents (Duke7, Thomas, G6, Spencer, Duke 9, UC2001, Barr Duke, Toro Canyon, and PP40) but today we have advanced selections from 12 additional maternal parents (Zentmyer, PP29, PP36, PP40, PP52, PP57, PP80, PP81, VC7, VC66, VC256, and VC801) due to our breeding and selection strategy. Therefore, the rootstock program is now currently establishing a 'second generation' of advanced selections to move to field trials that were originally collected from the better performing rootstocks.

We are also now collecting advanced selections from some of our salt tolerant VC maternal parents to try and incorporate both salt tolerance and PRR tolerance into a single rootstock which would be helpful to California avocado growers, especially in the Southern California area that has experienced increased salinity conditions due to the use of reclaimed water sources.

Recent research has been focusing on examining both the host and pathogen genetic diversity to better understand this disease using modern molecular tools. We have found that our advanced selections are genetically diverse, which should increase the probability of incorporating different mechanisms of resistance into new selections in the future and this information can also be used to help us set up new breeding blocks utilizing the best and most diverse sources of rootstock germplasm.

We have also found evidence that a potentially new introduction of *P. cinnamomi* has occurred in California. Some isolates of *P. cinnamomi* collected in 2009 and 2010 were found to be genetically distinct from isolates that represent what is currently known about the genetic diversity of *P. cinnamomi* in California.

Determining if this potential introduction posses a threat to the California avocado industry is extremely important and studies are planed to determine if these isolates behave differently with respect to grow rates, sporulation, pathogenicity, and salinity tolerances. This latter case may be important because these new isolates thus far were only found in the Southern growing areas of Riverside and San Diego Counties.

The ultimate objective of the rootstock-breeding program at UCR is to develop the best possible rootstocks for California growers with a primary emphasis on root rot tolerance. This program has historically been seminal in this mission starting with the Duke 7 rootstock developed in the 1970s. The UCR program has developed or been actively involved in the development of most of the clonal rootstocks that are now used in the global avocado industry.

For example, the Dusa rootstock, a selection of South Africa, represents 57 percent of the clonal rootstock tree orders estimated for

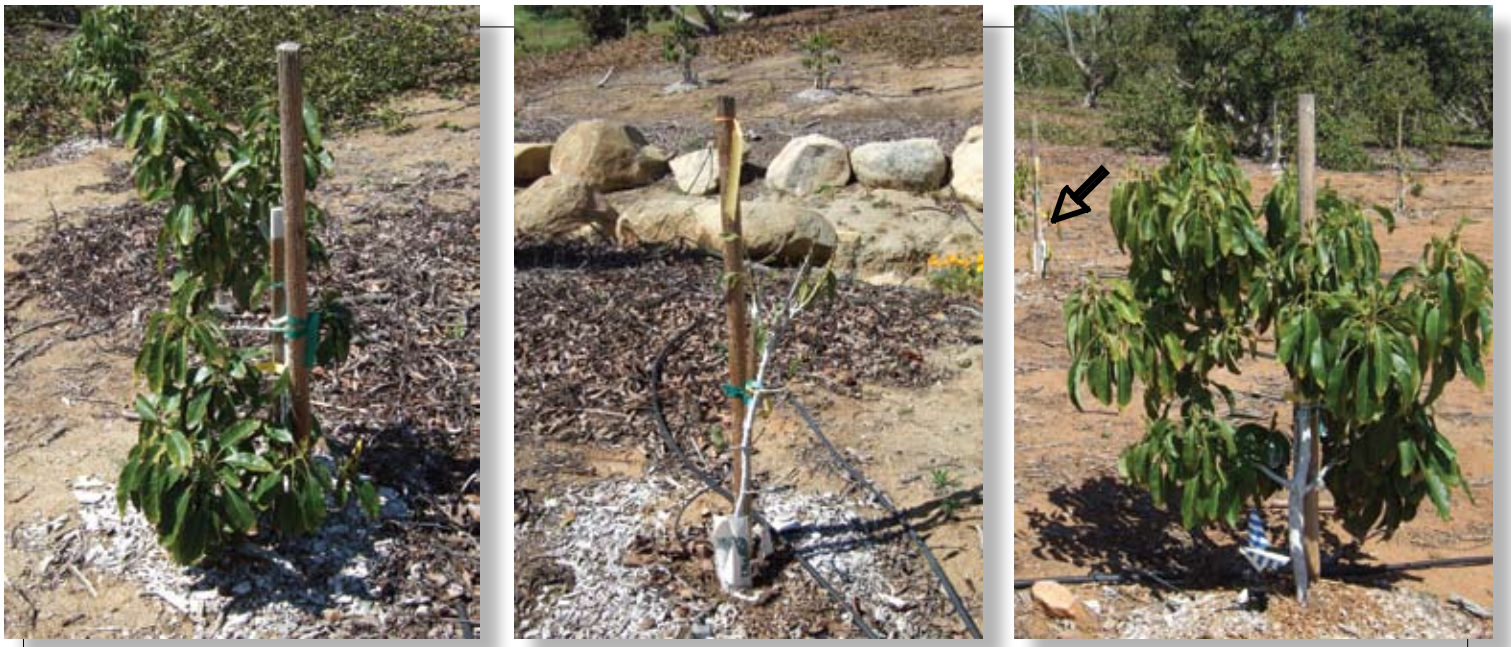

*Figure 1. Performance of Hass scions grafted to some rootstocks growing under significant PRR conditions at a field plot in Southern California. Left, Brandon rootstock. Middle, Thomas rootstock. Right, Eddie rootstock with a Thomas rootstock in the background (arrow).*

2012 from Brokow Nursery, followed by Toro Canyon and Duke 7.

Within California, the rootstock-breeding program at UCR was instrumental in developing and or testing these rootstock varieties.

Currently, the University of California has just released three rootstocks developed from this program which are available for commercial propagation by nurseries; 'Zentmyer', 'Uzi', and 'Steddom'. When comparing these new varieties to the industry standard Dusa, Hass trees grafted to Dusa still perform slightly better with respect to yield.

However, on an individual trial basis this is not always the case, which is not surprising given the variable growing conditions throughout the avocado growing areas. Therefore, growers can determine themselves which trees perform best under their own growing conditions now that additional tolerant rootstock choices are available.

We also have some additional rootstocks that are showing great promise such as Brandon and Eddie (Fig. 1). Over the next five to 10 years, there is also a high probability that additional clonal rootstock selections will be available given the advanced stage of the rootstock-breeding program funded by the California Avocado Commission.

One of the future goals of the rootstock-breeding program is to try and figure out a way to field test more of the advanced selections that have made it through the initial greenhouse screening more efficiently. We also plan on screening these initial rootstocks for salinity tolerances prior to field-testing in an effort to combine both salinity and root rot tolerance into a single rootstock.

It will also be important to collect data on soil types within our field trials to determine if any correlations are found between rootstock performance and soil type. This is something that has not been considered in the past but needs to be done in the future, especially given the amount of new potential rootstock material that the program has developed.

Our recent efforts to focus on the population biology of *P. cinnamomi* have also been important and determining if this potential new introduction of *P. cinnamomi* posses any new threat to the industry will be a priority.

Controlling PRR of avocado meets one of the most important avocado industry priorities since the disease is often the limiting factor in avocado production worldwide. If PRR is controlled, avocado yields, growth, and fruit quality will all increase dramatically. More importantly, profitability will increase for individual growers. An integrated approach toward controlling PRR is still the best means of reducing this disease but the ultimate long-term objective of this program is to find a truly PRR resistant rootstock for avocado.

Research has proceeded for many years using traditional approaches and we just now have the molecular tools necessary to leap forward in our understanding of avocado genetics and how genomic diversity is associated with PRR and other important agronomic traits. These newer approaches, along with the current traditional approaches, will certainly play a major role in advancing our breeding efforts. In the long run, this will lead to better disease control and higher profitability to the avocado grower.

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**The Celebration begins** Saturday with a luncheon
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# Commission Launches Water Pricing Campaign

By Ken Melban
*CAC Director, Issues Management*

The California Avocado Commission staff and board continue to develop and move forward with a plan that will hopefully result in more affordable water deliveries for California avocado growers in the long-term. The strategy is straightforward: reinforce the benefits provided by the agricultural base to both the wholesale and retail water agencies and build on the existing support within the urban community for sustaining agriculture.

While the Commission is optimistic some success will be experienced, it is important to remember that the task at hand is monumental. "We (CAC) have an obligation to make every reasonable effort to lower and stabilize the water prices," said Charley Wolk, CAC Water Committee chair. "This is a huge challenge that will take time," he said.

Water availability and pricing are a function of some very dynamic variables. Growers on district water generally receive at least a portion of their supply from the State Water Project. Environmental constraints, whether in the form of endangered species or below average precipitation, generally result in fluctuating supply allocations. These have caused water wholesalers and retailers to call on customers to conserve, decreasing demand even in the face of population growth. For example, it wasn't long ago that the Metropolitan Water District (MWD) sold 2.4 million acre feet (maf) of water in a year. Last year, that number was closer to 1.6 maf. Although sales have gone down, delivery costs—in the form of energy for transportation of water over vast distances—have gone up. Water agencies argue that the only way to address this situation is to raise rates to meet their fixed costs.

The Commission has developed a number of tactics intended to support the strategy mentioned above, and over the last few months has started implementation through the following steps:

## One-on-one meetings with water agencies directors and staff.

In December, Commission representatives organized a meeting with five board members and two staff members from a major water agency followed by an avocado grove tour. The purpose of the meeting was to learn more about the challenges faced by the water agencies and communicate California avocado growers' challenges. At one point in the meeting a water agency board member commented, "Well, you can't grow avocados if water is $800 an acre foot."

Commission representatives quickly pointed out that in some avocado growing regions growers are paying $1,200 an acre foot. This example confirmed that in some instances there is a lack of understanding by water agency board members as to the actual cost of water to the end users, and an improved understanding is necessary if agriculture stands any chance of receiving an adjusted rate.

Over the last few months Commission staff and board members have participated in many meetings with water agency directors and staff in both the northern and southern growing areas. The Commission is determined to continue our effort to improve directors' understanding of how the increasing costs of water are impacting California avocado growers. We believe that together a solution can be developed.

## Evaluate the economic and environmental benefits of avocado production.

The Commission is sponsoring two projects with the University of California Ag Issues Center to underscore and quantify the socio-economic benefits that agriculture brings to the Southern California region.

The first study examines agriculture's contribution to the region economy through direct and indirect employment, taxes, processing and shipping, food security and farm-gate value. A second study will use modeling to predict impacts on agriculture from rising water prices, as well as the effect of lost agricultural demand on water agency revenues. Also under consideration is an in-depth study of the environmental benefits associated with planted tree crops in Southern California, such as the potential to offset greenhouse gas emissions and improvements in air quality. This last area of study, in particular, appears to hold significant potential, as businesses throughout the state plan for compliance with

*Water agency and Commission representatives tour an avocado grove*

California's Global Warming Solutions Act, AB 32 passed in 2006. The scientific data from these projects will be used to substantiate positions taken before public policy makers and influencers with respect to water pricing.

## Water use efficiency.

Currently MWD has an agriculture conservation program that is available for agriculture users who "opt-out" of the Interim Agricultural Water Program (IAWP), which ends on December 31, 2012. The existing conservation program provides incentives for agricultural system capital improvements to improve water use efficiency and currently covers 50 percent of equipment costs. To date the program has seen limited participation from avocado growers and the Commission has met with MWD and member agencies staff to explore options for increasing participation. Considerations include an increase in the percentage of paid equipment costs, the identification of additional equipment eligible for reimbursement, and strategies to amortize up-front capital costs over time.

## Determination of Costs of Service.

The Commission is working to define the wholesale and member agency retail costs in order to help identify opportunities where an adjusted agriculture rate could actually result in increased ag sales. The Commission would like to explore the possibility that through an ag rate reduction agencies could actually see an overall increase in revenues. Currently this is counter-intuitive, so the Commission is working to develop the necessary modeling to support this approach.

## Extension of the existing Special Agriculture Water Rate (SAWR).

The San Diego County Water Authority (CWA) offers a Special Agriculture Water Rate to member agencies who are buying water to meet agricultural demand. Although the program has been in place for some time, it is scheduled to be modified at the end of 2012. The modification, as currently planned, would result in a smaller differential for agricultural customers.

In conjunction with the Farm Bureau, the Commission is working side-by-side with CWA and several of its member agencies to keep the SAWR in place as it is currently configured through the end of 2015 when the program is scheduled for reevaluation. Initial meetings with CWA took place in February, and the effort is expected to gain momentum as the year progresses.

These are just a few of the water-related activities the Commission has been involved with as your advocate. We realize the long-term effort and commitment necessary to improve the affordability and quality of California avocado growers' water supplies. Although this is an uphill battle, we feel confident that incremental progress can be made. The situation is reminiscent of the old expression: How do you eat an elephant? One bite at a time.

# From Your Commission

*By April Aymami*
*CAC Industry Affairs Manager*

# Improving Grower Communications

In the inaugural issue of *From the Grove*, we introduced growers to CAC's 7-Point Plan, which are strategies for achieving long-term industry sustainability.

Point number 6 in the plan is: "Seek continual improvement in grower communications." A first step in that direction was the creation of this publication, which aims to put more information into the hands of growers. Through use of this industry magazine, we are attempting not only to improve CAC's communications to growers, but to enhance and improve communication among the California avocado industry as a whole.

## Calendar of Events

### March 2012

**3/23/12 – CAC Annual Meeting**
**Fallbrook (9:00-11:00 a.m.)**
**Pala Mesa Resort**
**2001 Old Highway 395, Fallbrook, CA 92028**

**3/27/12 – CAC Annual Meeting**
**Santa Paula (1:00-3:00 p.m.)**
**Santa Paula Community Center**
**530 West Main Street, Santa Paula, CA 93060**

**3/28/12 – CAC Annual Meeting**
**San Luis Obispo (9:00-11:00 a.m.)**
**University of California Cooperative Extension**
**2156 Sierra Way, San Luis Obispo, CA 93401**

### April 2012

**4/10/12 – CAS/CAC/UCCE Grower Seminar**
**San Luis Obispo (1:00-3:00 p.m.)**
*Topic: Avocado Pest Identification and Control*

**4/11/12 - CAS/CAC/UCCE Grower Seminar**
**Ventura (9:00-11:00 a.m.)**
*Topic: Avocado Pest Identification and Control*

**4/12/12 - CAS/CAC/UCCE Grower Seminar**
**Temecula (9:00-11:00 a.m.)**
*Topic: Avocado Pest Identification and Control*

### May 2012

**5/17/12 – CAC Board Meeting**
**Ventura Four Points by Sheraton**
**1050 Schooner Drive, Ventura, CA 93001**

### June 2012

**6/5/12 - CAS/CAC/UCCE Grower Seminar**
**San Luis Obispo (1:00-3:00 p.m.)**
*Topic: Irrigation Tools and Phytophthora Control*

**6/6/12 - CAS/CAC/UCCE Grower Seminar**
**Ventura (9:00-11:00 a.m.)**
*Topic: Irrigation Tools and Phytophthora Control*

**6/7/12 - CAS/CAC/UCCE Grower Seminar**
**Temecula (9:00-11:00 a.m.)**
*Topic: Irrigation Tools and Phytophthora Control*

**6/19/12 – CAC District Grower Meeting**
**Fallbrook (9:00-11:00 a.m.)**
**Pala Mesa Resort**
**2001 Old Highway 395, Fallbrook, CA 92028**

**6/20/12 – CAC District Grower Meeting**
**Santa Paula (1:00-3:00 p.m.)**
**Santa Paula Community Center**
**530 West Main Street, Santa Paula, CA 93060**

**6/21/12 – CAC District Grower Meeting**
**San Luis Obispo (9:00-11:00 a.m.)**
**University of California Cooperative Extension**
**2156 Sierra Way, San Luis Obispo, CA 93401**

In addition to the *From the Grove* publication, CAC produces a semi-monthly electronic newsletter entitled The Greensheet. Through this newsletter, CAC is able to provide timely news and information affecting the California avocado industry. If you are not currently signed up to receive this newsletter and would like to be added to the list of recipients, please visit http://www.californiaavocadogrowers.com/greensheet-sign-up.

Outside of the two formal CAC publications, the Commission also maintains a database of grower email addresses, by grove zip code, to provide area specific updates (such as quarantines, water agency related info, and so forth) to growers. If you would like to receive district/area specific emails from CAC, please drop a note to cac.iaf@avocado.org.

In the Winter 2011 issue of *From the Grove*, Chairman Ed McFadden invited California growers to get to know their Commission. He took the time to highlight key issues that CAC is currently tackling; encouraging growers to become more engaged with important programs such as GAP and Production Research and to attend CAC district grower meetings.

In addition, the Winter 2011 issue featured a four-page spread of the CAC Board of Directors so that growers would know who to contact as their district representative In this issue, we're going one step further and introducing California growers to the Commission staff. CAC has a seasoned team of 13 individuals working on behalf of the California avocado industry, each with a specific area of expertise. We have included contact information and encourage and welcome input directly from California avocado stakeholders. Take a moment and visit pages 20 and 21, to put a face to the name and get to know who is working at CAC.

We have also added a new feature to the magazine to encourage grower participation in industry events. At the bottom of the first page to this story are upcoming industry meetings and events scheduled to take place over the next few months. Take a moment and locate a CAC board, district meeting or grower seminar in your area and make a point to attend. These meetings provide growers the opportunity not only to connect with CAC, but to meet and network with other growers in the area. Events are continually being added throughout the year, so bookmark CaliforniaAvocadoGrowers.com/Upcoming-Meetings-Events and check in often for the most up-to-date information or further event details.

While improving grower communications was included in the 7-Point Plan, which was focused on results for over the next three to five years, CAC's grower communication program is constantly evolving to meet the needs of the avocado community, and will remain an imperative at the Commission for years to come.

If you have comments or suggestions on how CAC can continue improving in this area, please contact us at cac.iaf@avocado.org.

***Please note that all of CAC's contact databases are held strictly confidential and will only be used for the purposes of providing Commission communications.***

California Avocado Commission

## Board of Directors

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Alternate/Jerome Stehly

Member/Carol Steed
Alternate/Bill Rice, Jr.

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Alternate/Ohannes Karaoghlanian

Member/Charley Wolk
Alternate/Joanne Robles

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Alternate/Steve Shehyn

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Alternate/Keith Reeder

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Alternate/Larry Rose

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Alternate/Ron Araiza

Member/Reuben Hofshi
Alternate/Katy Otis

Member/Steve Taft
Alternate/Bob Witt

**Public Member**
Andria Pontello

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

# HAB Poised for Future Growth

## By Tim Linden

With a new executive director, the Hass Avocado Board (HAB) is poised for the same growth that the industry should sustain over the next few years.

Emiliano Escobedo, who assumed the position of executive director on Jan. 16, is excited about the opportunities for avocados and the board itself. "I have a passion for avocados," he said, and backs it up with the revelation that his decade-long career has never strayed far from the fruit.

Escobedo, who turns 31 this year, graduated from the University of Florida at Gainesville almost a decade ago with a keen interest in the international agriculture business. "I was always very interested in how we get our food from the field to the plate," he said.

He studied research economics in college and found himself a position with a public relations firm in New York after graduating. Among the first accounts he worked on was Avocados from Mexico (APEAM), which led to a position with that organization several years later.

For the past half dozen years, he has been working with APEAM but is now poised to take his experience to the broader HAB stage.

He expects to institute no major changes for the organization but rather follow the strategic plan that HAB has developed. Escobedo articulated that plan as having five major components: working on maturity standards; developing a global data system; being the industry representative and working with the various regional organizations; leveraging nutrition information for the betterment of the industry; and improving the communications within the industry.

Above all, Escobedo said HAB exists to increase the consumption of Hass avocados. "We will continue to take a leadership role in that area and support the work of all of the other associations and organizations."

HAB has taken over the nutrition research role, which originally was developed by the California Avocado Commission. Escobedo said that it is a very important component of HAB's work and the goal is to leverage that nutritional research to increase consumption and improve the positioning of the avocado.

He called the work with the maturity standard another important endeavor. Currently, the U.S. avocado industry, including the importers of fruit from other regions, is debating the merits of stronger standards. Escobedo said HAB will take a leadership role in this effort which is designed to improve the quality for all stakeholders along the avocado supply chain. Improved quality can translate into a better eating experience for the consumer and increased consumption of the fruit. Escobedo indicated that HAB is the perfect venue to discuss the various concerns and advantages inherent in a new maturity standard.

*Emiliano Escobedo*

In general, the new HAB executive is excited about his role and the role of HAB within the industry. He believes HAB can continue to strengthen its leadership position as the industry association representing all points of origin and exporters on issues of concern.

Seconding that viewpoint was Jimmy Lotufo, the current HAB chairman and the senior sourcing and business development manager for Rosemont Farms, Boca Raton, Fla. "Our main role is to increase the consumption of avocados in the United States, and increase the market share of our stakeholders," he said.

He added that choosing Emiliano Escobedo to head the organization as its executive director will enhance that mission "as his diverse background and experience within the category told us he was the right person for the job."

Lotufo echoed Escobedo's comments stating that HAB has a unique and important role as it represents all of the production districts on its board bringing together those different interests for the common good of the industry. He said the current effort with regard to the maturity standard is a perfect example of the kind of issue that HAB can address. It is an industrywide issue and it needs an industrywide solution.

Lotufo is very bullish about the future of avocado sales in the United States. "I think we have only scratched the surface for what is the potential for this market. We know New Zealand, Australia and South Africa are knocking on the door wanting to get in because they have done their homework and they see a market that is expanding."

From the current sales volume of close to 1.2 billion pounds annually, Lotufo said he expects significant growth in the future. "As long as everyone stays focused on producing a consistent, good quality avocado and we combine that with strong promotion I think the sky is the limit on future sales."

# Capturing the Appetite Appeal Of California Avocados

## A Behind-the-Scenes Look into California Avocado Recipe Development and Acquisition

By Zac Benedict
*CAC Marketing Communication Specialist*

To build California avocado demand and drive consumption during the California season, the California Avocado Commission (CAC) develops and acquires recipes for use in marketing programs that inspire CAC target consumers to try the fruit in new or unique ways. CAC's target consumer loves recipes; and to meet or exceed this demand for recipes, CAC continuously monitors recipe, nutrition and diet trends for inspiration in addition to looking for opportunities for unique pairings and usage ideas. Inspiration fuels the recipe development and acquisition process as CAC turns to expert recipe developers, chefs, bloggers, Registered Dietitians, consumers and other promotional partners for recipe development, acquisition, nutritional analysis and photography. The result is a recipe database almost 1,000 recipes strong that month after month proves to be the most highly trafficked (and shared) area of the Commission's consumer website.

*Summer Fruit Salad with California Avocado Dressing*

### Why Create Recipes?

CAC research indicates that the CAC target consumer buys a large amount of avocados and considers them a staple in their diet. They also consider themselves connoisseurs in food, shopping and cooking. Additionally, the research indicates that they cook mostly from scratch, enjoy trying new and different foods and entertain family and friends in their homes at least once per month.

The California avocado consumer continuously looks for delicious ways to use California avocados, so it is very important to provide them with fresh recipe ideas. CAC's marketing staff uses research to understand consumer values, and to aid in direction for recipe and program development.

As CAC begins its annual planning process near the end of every fiscal year, the CAC marketing team collaborates to form direction on recipe needs for use in upcoming CAC programs. With similar holiday, entertaining opportunities and events year after year that align with the California avocado season, the CAC team continues to focus on the recipes that build the most interest during the spring to fall months, with renewed emphasis in 2012 on American summer holidays.

During the California avocado season the CAC target consumer finds inspirational and timely recipes through targeted in-store marketing including point-of-sale material, recipe tear pads, Registered Dietitian newsletters, shelf-talk banners in non-produce sections of the store and in-store radio. Additionally CAC reaches consumers through targeted magazines, newspapers, recipe brochures at events and online through social media, blogs, banner ads, monthly recipe e-newsletters and the CAC website. With a wide variety of communication avenues reaching the consumer, the need for fresh, timely recipes becomes increasingly apparent.

## Recipe Development

Through the recipe and program planning process, CAC reviews many recipe concepts and selects recipe ideas that align with the upcoming campaign needs. Once that process has been completed, recipes are developed and tested by key CAC partners to ensure that the finished recipe is as delicious and appealing as anticipated.

*Testing two new CAC recipes: the California Avo Colada (left) and the California Avojito (right)*

*Completed testing, adjusting of the two beverages and photography. California Avo Colada (left) and the California Avojito (right)*

Once testing is complete, and final recipes have been determined, a food stylist and photography crew are selected, props are collected and time is scheduled to begin the photography process:

## Recipe Acquisition

CAC also receives recipes from a variety of other sources, including bloggers, chef partners through the California Avocado Artisan Chef program, Registered Dietitians, consumer, trade and co-marketing partnerships, recipe archives and consumer submissions. In these cases, CAC negotiates arrangements for usage in all (or applicable) areas of California avocado marketing programs.

## Nutrition Analysis

Once recipes are developed or acquired, CAC chooses to conduct a nutritional analysis on many of them. Nutrition analysis helps inform consumers about recipe nutrition information. Additionally, nutrition information is used to determine if a recipe is eligible for the Mediterranean Diet, Fruits & Veggies More Matters® logo designation or the following nutrition attributes: Diabetic, Low Sodium, Vegan or Low Calorie.

## Results

Maintaining premium brand positioning and increasing California avocado demand when in season is a key priority for the Commission, and recipes are a critical part of the California avocado marketing equation. In 2011, nearly 100 recipes were added to the CAC recipe database, and in 2012 we anticipate similar or greater results.

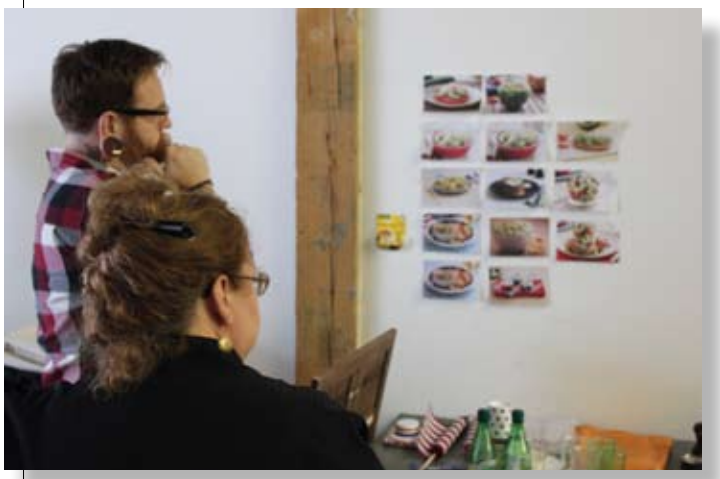
California avocado recipes are one of CAC's greatest assets, and bring CAC's website to the top of many popular recipe searches online. Quality recipes, photos and nutrition information position CAC as an official source for avocado recipes that consumers rely on for new and favorite recipes time and time again.

*1. On location at the photography studio, a food stylist meticulously prepares each dish in the test kitchen.*

*2. While the food stylist is preparing the food, the photography crew, CAC staff and agency team members identify props and imagery to compliment the appearance of the photo and the dish.*

*3. Once props are chosen (plate, bowl and table top in the above photo) and the stylist has completed preparation, the dish is moved to the set and the finishing touches are made while the photography crew adjusts light, camera and computer settings.*

*4. Composed recipes are reviewed, previewed via the camera on a computer screen, adjusted and photographed on location before approval to ensure that the recipe looks great and the California avocados in the photos look their finest. Several shots of the same recipe are taken just in case.*



*5. Photos from the photography team are delivered to CAC in only a few days but are not yet complete. The photos go through a round of review and digital touch ups to clean up any last remaining issues before finalization.*

*6. The photo is now ready for use in materials and posting on the website.*

*by Ken Melban*
*CAC Director, Issues Management*

# Chilean Avocado Production Explored

Chile has been exporting Hass avocados since 1980 with significant volumes arriving in the United States by the late 1980s, largely complementing the California season.

The Chilean production season runs from July through June. During 2011-12, 170 million pounds of Hass avocados have been shipped to the U.S., according to Adolfo Ochagavia, president of Chile's Comite de Palta (Comite), with volumes winding down by the first week in April. Although it is still too early to predict with certainty, Chilean Hass shipments to the United States in 2012-13 are expected to be lower---perhaps 150 million pounds---in part because of adverse weather conditions.

Most Chilean avocados are produced in the central area of the country under arid conditions with little rain. Of the estimated 37,650 hectares planted to avocado, some 30,000 are Hass, which accounts for nearly 100 percent of total avocado exports. In 2011, the Aconcagua Region in Chile experienced a severe drought, particularly the Cabildo Valley. That, combined with the uprooting of old, non-productive orchards, caused total planted acres to decline by an estimated 3,000 hectares.

Chilean exporters remain optimistic about avocado demand, however, both at home and abroad. During the last few years domestic consumption of avocados has drawn the attention of Chilean producers. Increasing production costs, devaluation of the dollar against the Chilean peso, and increasing demand appear to be making the internal market more attractive.


On the export side, a concerted industry effort to diversify markets seems to be paying off. Neighboring Argentina, in particular, has experienced good growth and the Comite's promotional efforts in Spain, Denmark, Sweden, Germany and the United Kingdom make Europe second only to the United States in export volume.

Still, the United States accounts for 60 percent of Chilean Hass avocado exports. Ochagavia says that about two-thirds of the U.S. volume goes to West Coast destinations with the balance being sold in the eastern half of the country.

Under the authority of the Hass Avocado Board, all fresh domestic and imported Hass Avocados sold in the U.S. market are assessed, with 85 percent of collected assessments returned to the respective country's marketing organizations to be utilized for U.S. marketing. The Chilean Avocado Importers Association conducts U.S. marketing on behalf of the Chilean importers and spent approximately $4.2 million in 2011.

This upcoming season promises to be an interesting one for all suppliers to the U.S. market, including Chile. A larger California crop, currently estimated at 390 million pounds, a smaller Chilean crop, and significant arrivals from Peru will likely affect the timing of shipments from Chile during the critical fall period. Fall promotions and good fruit quality will be key to market stability as the market transitions, and Ochagavia notes that Chile will do all that it can to make the U.S. market as strong as possible.

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# CULTIVATING GROWERS

**Kelly Haeseker, avocado grower in Montecito—**

**"My grandfather grew citrus with pride and care, and I loved the groves as a child. I ventured into the avocado business three years ago after acquisition of an 84-acre avocado ranch. The forty-year-old orchard was in a weakened state due to many years of neglect and mismanagement. Having no formal ag training, I welcomed the expertise of my Index Fresh field man as we began the process of rescuing the trees and increasing production. With determination, cutting edge science, and hard work, we witnessed a transformation nothing short of a miracle.**

*About eight months ago, another avocado grower had heard about the turn-around of our ranch and shared her experiences with me, about a different large packer that was handling her crops.*

*She felt she wasn't getting sufficient attention or service from them and that their prices weren't competitive. I told her, "You really should try Index Fresh."*

**KELLY HAESEKER**
**Avocado Grower**

**From our 2008 harvest to present, we've increased our production eight-fold and increased the size of our fruit dramatically.**

**With the guidance of Index Fresh, we have successfully saved the last large coastal ranch in Montecito."**

**Contact our local field staff for a look at Index's historical returns:**

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Gary Nichols (805) 659-4929

**Santa Barbara & San Luis Obispo Counties:**
Giuseppe Bonfiglio (805) 341-3059

**Southern Counties:**
Jose Avina (951) 676-8696

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