

Huge Successes Achieved at Avocado Brainstorming 2015 & VIII World Avocado Congress

Brainstorming

Avocado Brainstorming is a small meeting held every four years and organized by Dr. Mary Lu Arpaia and The Hofshi Foundation. This year's Brainstorming was held the week prior to the World Avocado Congress in Ica, Peru. Sixty-one attendees from 12 different countries participated in the meeting. The meeting was organized into eight sessions covering topics such as the challenges of expanding international trade, health and nutrition of avocados, limitations to productivity and invasive pests and diseases. Each session was about two hours long and chaired by two or three topic experts who presented a summary of recent research in the relevant area. Each session was followed by a Q&A period.

Overall, Brainstorming was an excellent meeting and I was encouraged by the positive attitudes everyone had about the future of the world avocado industry. The scope of topics covered was very good and hit upon all the critical issues facing world avocado production. Despite the California industry no longer being the dominant player in the world avocado industry, it was clear from everyone's comments that our research program and researchers are still looked to as

the benchmark against which others are measured. And most of the other industries credit California for developing the world avocado market.

One of the things that made the Brainstorming meeting great was its small size. The limited number of participants allowed for a lot of interaction and communication. In addition, people felt free to share ideas and unpublished research findings because of the intimate nature of the meeting. That said, the size was also one of the meeting's limitations; there were a number of key researchers who were not present who would have been able to add quality ideas to the discussions. However, had the meeting been much larger I'm afraid people would have been more guarded and less willing to share ideas.

The Brainstorming event is by invitation only and I heard mixed feelings from researchers before, during and after the meeting concerning this. One researcher told me that because the meeting is closed he declines the invitation to attend. Others credit the invitation process for giving the meeting its intimate feel and openness of discussion. The organizing committee made a concerted effort to invite younger researchers to this Brainstorming and about half of the attendees were new or mid-career

scientists. My experience has been that younger researchers are open to sharing ideas and not as concerned about their ideas being stolen as compared with more senior researchers. I think this is partly due to the fact that the scientific questions being asked today require more and more cooperation and the younger generation is more comfortable with that environment. Thus, as the average age of Brainstorming attendees decreases there may be a trend toward less exclusivity.

A big challenge with a meeting like this is simply the time factor. There is a lot to cover in two and a half days. I think it's fair to say everyone would have liked more time, but with the World Avocado Congress scheduled for the following week, it was a challenge for many people to spend two full weeks away from their work. To address this it was decided to move future Brainstorming meetings off-cycle from the Congress. This may allow for more time in which to host small breakout sessions where researchers can start to develop frameworks for future collaborative research projects, or to host more in-depth discussions on specific topics at future Brainstorming meetings.

A couple of research highlights

related to propagation of avocados and improving our understanding of phytophthora stand out. Dr. Neena Mitter's lab from the University of Queensland, Australia, has been working very hard to develop tissue culture (TC) techniques for avocados. True TC involves taking any cell in a plant, multiplying it in a culture system, and getting those new cells to differentiate into various plant organs (stems, leaves, roots). This is in contrast to the advancements made by Duarte Nursery where they are simply doing shoot multiplication in culture. Dr. Mitter's lab has been able to achieve greater than 40 percent success in TC with several varieties. However, it will likely be a long time before the average grower will buy a tree produced by TC. Rather, they are now exploring this technology to preserve germplasm in a much more cost effective and secure manner. They are making considerable advances in cryopreservation of their TC material. They have been able to freeze 'Reed' TC material in liquid nitrogen for up to 12 months and maintain 60 percent viability. As our world-wide industry looks at looming pest and disease issues, such as shot hole borers and laurel wilt disease, these preservation techniques will be critically important.

Significant advances in understanding the pathogen-host interaction of phytophthora on avocado were also presented. Dr. Noelani van den Berg's group at the University of Pretoria, South Africa, has been working to understand, from a molecular and genetic approach, what causes phytophthora to be pathogenic. Similarly, Dr. Mitter's group has been working to understand the molecular and genetic response of the avocado tree to phytophthora. Although their respective research is intriguing, there are no simple answers on either side. This work will help to identify weaknesses within the pathogen that can be targeted by

new control strategies and identify breeding lines that have a group of traits related to resistance to improve traditional breeding efforts.

It is often difficult to find specific outcomes of meetings like this that will directly impact growers. However, in my opinion, these types of meetings are invaluable. These are the venues in which new ideas are generated, research collaborations are made and problem solving takes place. Although there is not one single outcome from this meeting that directly impacts growers today, it is likely many advancements that will come along over the next 10 years will trace their beginnings to this or other Brainstorming meetings.

World Avocado Congress

The World Avocado Congress (WAC) is held every four years and this year's meeting took place in Lima, Peru, September 13-18, 2015. There were about 1,500 attendees representing every avocado growing region of the world. By far the largest contingents were from Central and South America. The meeting was organized into three concurrent sessions each day. Room 1 talks focused on genetics, nursery management, and pests and disease; room 2 talks centered on cultural management; and room 3 talks covered marketing, human health and nutrition, and postharvest/processing. In addition, there were two keynote speakers each day who presented to the entire audience.

This was my first WAC so I do not have a frame of reference to judge this congress compared to previous ones. Overall, the venue seemed a little small for the number of attendees and some of the meeting rooms were quite crowded; however, the content of the talks was top notch.

There was an optional field trip on Wednesday to see avocado groves, and each group had the opportunity to visit two different groves. The

groves that my group visited were standard groves with no exceptional production practices. I'm uncertain if this was the same for each group or just the luck of the draw, so to speak. It would have been nice to visit some more progressive groves such as high-density plantings or unique pruning systems.

The presentations were generally high quality and well presented. In the genetics and nursery management sessions a number of people presented on their experiences testing clonal rootstocks, including researchers from Spain, New Zealand, Australia and Chile. This struck me as a good example of how California has been a trendsetter in the world avocado industry. A number of people presented from South Africa to discuss various aspects of their breeding program. I think it is safe to say that there will be some new, highly phytophthora tolerant rootstocks coming out of the South African program within the next five years or so. It will be important for California to maintain close communication with South Africa and evaluate these new selections under our conditions as soon as possible. Additionally, a number of researchers presented on the topic of understanding the avocado tree response to phytophthora infection, building upon what was presented at the Brainstorming. Again, although great progress is being made in understanding the mechanism of host response, the hurdle will be translating that knowledge into practical advancements in rootstock breeding, which is still a ways off.

In the cultural management sessions there were numerous presentations on the use of uniconazole and paclobutrazol plant growth regulators (PGRs), particularly in high-density plantings. I was asked multiple times why we don't use these products in California. Not considering the registration issues (many millions of dollars and not supported by

the chemical manufacturers), PGRs are tools in a larger production system that is best described as intensive management, not just high-density. Even if registered in the United States, I don't think these chemicals would be very useful considering the way most growers currently grow avocados in California. This is a difficult situation analogous to the chicken and egg. Is the lack of PGRs the reason more growers in California are not growing high-density or is the lack of high-density plantings, and thus the need for PGRs, the reason they are not registered here? Perhaps if things change in the coming years, and avocado production in California becomes more intensive, it would be worth re-evaluating these products.

High-density plantings were covered by a number of speakers. What struck me most about this topic was the broad range of "management styles" for high-density plantings. There really is no one-size-fits-all solution and each country or region that has adopted high-density plantings has had to develop their own management system to suit their specific conditions. While there is a lot to be learned from these other regions, as high-density plantings are adopted in California we will likely need to develop our own management system, which may vary from region to region.

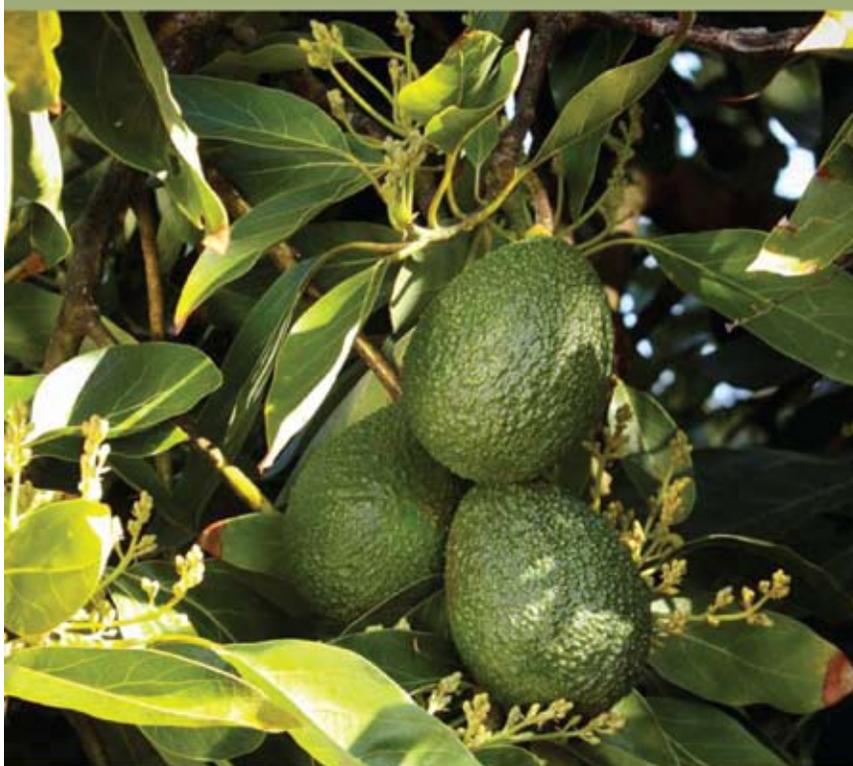
One presentation from a Chilean researcher was quite intriguing, presenting work on the use of electrostatic systems for the application of agrochemicals by helicopter. Electrostatic systems give the chemical particles a negative charge as they leave the spray nozzle. These particles are then attracted to the positively charged plant. Two big advantages of electrostatic systems are that they generally improve spray coverage and reduce chemical drift. This was the first time I'd seen this technology applied to helicopter applications. As

the ag-urban interface becomes more and more of a challenge in California, this may be a technology worth evaluating, whether for helicopter or ground sprayers.

Overall, the content of the WAC was good. I did notice quite a bit of overlap between the Brainstorming and the World Avocado Congress, al-

though there were more speakers on a given topic at the congress. I think it is a wise decision by the Brainstorming organizers to move the meeting off-cycle from future WACs. For me, personally, both meetings were very enlightening as this was my first opportunity to explore avocado production outside the United States. 🥑

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