

The World Avocado Congress: What We Learned

W.H. Brokaw

President, California Avocado Society

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Thank you, [Chairman] Don [Bartlett]. You don't have to worry; I'm only going to cover what I think is of special interest to Californians. Of course, I want to ostentatiously carry these [plastic syringes for tree injection] up to the front of the room because I know there's a lot of interest about these items.

This was the first World Avocado Congress. The South African delegation was sensitive about announcing that, since there had been another world meeting of avocado growers which had been sponsored by Don Gustafson some years ago in Florida. We assured them that it was okay to call this the "First" World Avocado Congress. One of the things that came out of that conference was a plan to have these congresses reconvene every four years. And, as we have communicated to you, we will be hosting such a conference (the University of California at Riverside and the California Avocado Society)—in 1991. It will be done in February. We're already working toward that end, and the first meeting of an organizational committee will occur this November. It will be a big job! One of the worst things about the congress in South Africa was, it was so darned good. It was extraordinarily well organized. They seem to have very deep pockets in South Africa, and so we stayed at great hotels, we were wonderfully fed, the hospitality was most gracious, and there were gifts and mementos given to us from time to time. We really appreciated the graciousness with which the South Africans received us.

Two of the persons who planned and presented that congress are here today. One of them, Jan Toerien, was really the genius behind it. He first thought of it, was the principal that carried it through, and made it an extraordinarily successful event. Jan, would you stand up for just a moment? [Mr. Toerien stood and received applause.] The second person that's here is a man who formed the first world committee in the avocado industry that I know of. It is a committee on collecting of breeding materials from all over the world. This is Dr. Terblanche—and Dr. Terblanche, would you stand up for us, please. [He did so, and received applause.] This genetics committee is one to watch. Genetics and germ plasm promise to be the heart of our research efforts in the future, both with regard to improving varieties, regarding your rootstocks, and it appears from the congress even interstocks. There'll be more different and more sophisticated nursery stock coming out in the future.

Who attended this congress? There were attendees from about 22 countries. Total attendance was over 200 people. The largest delegations were from South Africa, as

you can imagine, and Australia. Coming in third was California. There were no representatives from Florida. California I thought was under-represented, although we had probably 12 or 14 people. Partly, that was due to the current political situation. The political thing in South Africa of course is difficult, and it is viewed differently from here by most people than it is viewed by South Africans, as you can well imagine. We lost one Avocado Society member over this, because we announced that South Africa was having that congress. Our position, however, is not political. Our position is for avocados, and that was the purpose of the trip.

One of the very impressive things at the congress was the physical facilities. We were in a sort of a mini-U.N. building, I thought, because we all sat in a great, very luxurious auditorium. There were earphones there, and there were translators. Here in California we have our translators sit in the back of the room and have wires all over the place. There, you couldn't see any wires—they were planted into the table. The translators were safely tucked behind glass windows. It was really a marvelous layout. We told them that South Africans could come here *free*, if they would just bring their auditorium.

I want to talk a little bit about things of special interest. The thing of most interest to you, I think, is the avocado root rot program—I want to mention that later; but I do want to mention the following factors which I thought, from a Californian's point of view, were the most important. One is the fruit handling, a second one is the possibility of dwarfing rootstocks, and a third one was the formation of the world genetics committee.

With regard to fruit handling, South Africa is of course the one that we watched. Additionally, there were papers from different parts of the world on fruit handling. South Africa, though, was of special interest to me because they export all fruit. And that fruit is exported by sea, which means that it has a long residence time in some kind of a chamber before it arrives at the European market. And the fruit, interestingly enough, was not Hass fruit at that time of year. It was Fuerte, and they were doing it successfully.

The variety picture in South Africa is poles apart from here. Our industry has tended to diminish the number of varieties, to concentrate on the Hass and try to make it stretch. The South African approach, as I saw it, was entirely different. It was to have about half a dozen varieties—each of them offered at its peak season. That's a big difference.

Secondly, the handling of the fruit—we don't spend much money on postharvest research in this country. The Commission has a program where it's studying fruit maturity, and that's a necessary thing, in my view. In general, though, we neglect postharvest. We complain a great deal about our fruit as it appears in the retail outlets, and then we really don't do anything about it—we tend to blame somebody else for that having happened. We blame somebody or we blame a variety. But they in South Africa with their Fuerte are doing a good job. One of the things that was interesting to me was harvesting and handling at Westphalia Estates. The fruit was picked not in bins, but in boxes similar to those dairies use to deliver milk cartons. Harvested fruit was put into a cooling room at about 62 degrees Fahrenheit, as I recall, within two hours of coming off the tree. And there wasn't a big inventory in that room. That fruit went *fast* out onto the sorting line and into the regular storage. The sorting line was interesting, too. Being in South Africa, where the problems are different than they are here, it was a highly

manual operation; that is, a lot of hands going on, working with that fruit, gently. As it was dropped in the line, it was dropped very gently. That was one of the things that really impressed me.

The second point was the interest in dwarfing rootstocks. Our at-large director—that is, our foreign director—Dr. Sanchez Colin is here ... Will you stand up, please, Dr. Sanchez Colin? [Applause.] He lives in a part of Mexico where there is quite a lot of genetic variation, and one of these bits of genetic variation is in the production of dwarfing trees. He has introduced the Colin-33 and a number of other cultivars. He is reducing the size of standard varieties by using these as interstocks. And he had quite a few examples pictorially represented. It's my intention to go down there and see his operation, because I think it's of great interest to us. There are other people—George Zentmyer and so on—who have been down there already.

A third thing that I want to mention is the genetics work, because I'm convinced that there's an awful lot of technical progress in the avocado industry. Genetics diversity is going to aid in the solution of many of our current and future problems. We do not have the permanent varieties in the avocado industry today, I think. I believe most people would agree with that. Dr. Bergh's work, in which he produces thousands of trees that can be observed—trees with superior genetic strains in them, is bound to have important results in the years and decades that come.

The other thing, of course, is in rootstocks; and we'll have something to say about that at our regular meeting, because it's very important that we get these candidate rootstocks identified and into the trial mill. Dr. Bergh will also be with Dr. Terblanche on that genetics committee. I happened to show up in that meeting because I thought it was interesting.

Now, about chemicals. Both Australia and South Africa are able to use chemicals, try them, and get them into general use much quicker than we are here in California. One of the most interesting ones was a material whose trade name is "Guitar." It is known to some of you as "PP-333", and to some of you as "paclobutrazol." It shortens the internodes of stems. Now, we had quite a bit of theorizing in South Africa about how much fruit you could expect a tree to have due to its energy capacity. For instance, it was speculated there that probably the maximum tonnage we could ever expect per acre would be 30,000 pounds, or something like that. Why? Because of the oil and the carbohydrates and the fruit growth—all those things which have to go into fruit—and limitations to the photosynthetic potential to convert solar energy. Guitar reduces tree size, and therefore makes harvesting easier. Additionally, the theory is that it allows the tree to put more energy into the fruit instead of stem elongation and the formation of cellulose.

Now, I want to talk for just a moment about root rot. Both Australia and South Africa have saved their industries. They are under different conditions than we are, both legally and physically—geographically. Both areas are characterized by, I think, deep soils—soils, that are somewhat more acidic than ours, certainly more rainfall, and the rainfall tends to be in the summer instead of the winter, and so they have different conditions. They have solved their problems with the chemicals—in South Africa, Aliette®; and in Australia, with phosphorous acid. Phosphorous acid in Australia may be

used because the Rhone-Poulenc patent there, I believe, • is different than it is here in the United States or in South Africa; and there were some claims or instructions in it which, under Australian law, enabled them to by-pass it. So they do have a material now that they put out which is about a 20% phosphorous acid mixture. In both countries, they do it by injection.

People have been asking me about these [holding up a syringe]. I thought I'd just show them to you. You can see them. What this is is an injector. It's got a plunger. It's for a veterinarian. It's got a hole in the barrel and some holes here [indicating]. What they do, normally, is to drill a hole in the side of the trunk at a kind of an angle. You can see that there is a side-mounted spout on this one. They suck up probably 15-20 milliliters— I have it sucked up to 20 milliliters now; then they hold it up, get it the rest of the way out, so it's got a lot of air in it, they shove it in that hole, and then they squeeze like heck and compress the air. So, compressed air is the engine for it—squeeze it down to there as far as they can get it—compress that air, stick a nail down through those holes, and lock it in place. That's how it works, and I'll leave this here. I don't think I'll say any more about that right now.

Now, I'm going to ask Jan if he would say just a few words about their strategies for root rot in South Africa. They're certainly more complicated than I have just expressed.

Jan, would you be interested just to give some of the precautions and procedures that you use in order to keep root rot under control?

Incidentally, South Africa uses mostly clonal rootstocks. They're still working mainly with Duke 7, although the G-755 is under trial; and, of course, Dr. Terblanche here is going to see if we have got anything else.

JAN TOERIEN: Hank, thank you very much for those kind words. Ladies and gentlemen, most of you are producers. There are many scientists among you. To me, it's great to be here. There are so many people that had helped us when we started—I see Professor Zentmyer— especially when we started with *Phytophthora*. We owe a lot to the California industry, which through the publications and the scientists set us off on a course where we could get onto our own legs. We had a very difficult situation as far as *Phytophthora* is concerned. We've got high summer rainfall area. We've got heat and excess moisture at the same time, which is ideal for *Phytophthora*. So, about ten years ago we were in the situation, we ... all our groves—I would say 80 to 90% was infected with *Phytophthora*—on your scale, 0 to 5, I would say probably varying between 2.5 and 4.5. Our crops were very low. We had a situation: we had one and a half to two and a half tons, so we didn't really have an alternative. We had to get started on research. I listened to the vice director of UCR [University of California at Riverside] yesterday talking about the importance of research, and I agree entirely with him. We spent in grant money as much as your industry has spent, but to us it paid very handsomely. Today, we average 15 tons; it's a tenfold increase, and I would contribute 90% of that to the control of *Phytophthora*. Chemicals: We started off with Ridomil®. We had excellent results for two years, then we ran into trouble which we think is probably due to resistance or partly resistance. Then we started off with Aliette® as a foliar spray. That worked, but was slow and uneconomical. Then we came to the injection as Hank just showed you. That worked much faster. And, in 1982, we started with phosphorous acid.

We had fantastic results with that; but very soon, we ran into legal problems with Rhone-Poulenc, so it's Aliette® for us — Aliette®, not on its own: we make use of additives in the form of trace elements like zinc and boron. But, with chemicals, we do get fantastic results, provided that our cultural practices are also in line with it. Injection, for instance, cannot correct the situation where you've got bad drainage. Bad drainage will also be a factor over-ruling whatever chemical treatment you've got. We're certainly looking at all possible rootstocks available—as much resistance as possible, that's why we're going for fraternal rootstocks. We determine there's enough oxygen potential and soil drainage before we go in the program. A lot of *Phytophthora* was certainly due to over-irrigation, so we controlled that problem with tensiometers. We don't have clean cultivation like you; we try to get as much organic material as possible. We find certainly it is a contributing factor that speeds up the recovery rate of the trees. We found that high calcium levels are very good for *Phytophthora* recovery. As far as calcium is concerned, we're pushing up our levels from round about 80 to 200 to start off with to something like 1,000 to 1,500 ppm using gypsum and lime. But apart from *Phytophthora*, we've got thirteen other pathogens that can kill *Phytophthora*, so we live pretty much with pathology in our part of the world. We make use of leaf analysis. That shows us very quickly a drop in, for instance, zinc, or in combination shows us very fast when we're coming to problems due to rise as far as *Phytophthora* is concerned. Then, it was very interesting to me to listen to Mike [Coffey] yesterday, where he's got TW fungus as controlling *Phytophthora*, and that does say something else that I think is certainly for the future. We are looking at bacteria. We've got eleven different bacteria which we use in combination. They're not as good as those injections, but certainly everything contributes to the end results, which is the saving of fruit. Looking at the prices in California, and I think world-wide, I think expanding should take place in two. As we've seen with Professor Zentmyer this morning, there are awfully lot of avocados planted all around the world; and I think probably current planting conies up to increase this acreage, but to increase the production per acre and probably reduce the least productive acres around the world. That's it in short. I think that as far as *Phytophthora* is concerned, we try to make use of chemicals which have certainly done a great job for us, but I think there are other factors there that are probably equally of importance. I thank you very much.

BROKAW: One last word. This is a copy of the proceedings of the South African congress. This happens to be a hardbook copy; there are going to be softbook copies available. The Society has arranged to purchase some of these on consignment, and they will be for sale to interested people; and it's very interesting stuff that's in here. I'm going to leave this at the registration table, so you can take a look at it and see if you'd be interested in getting a copy.