



Society Exhibit at the Southern California Exposition at Del Mar.

REPORT OF THE ANNUAL MEETING

The Annual Meeting took place Saturday, March 10, 1984, at the Fallbrook Union High School Cafeteria. The Society hired a court reporter to accurately capture the meeting's proceedings, and the following is from his report.

My name is Tom Cooper. I am your current vice president and your program chairman today. We are going to hold a panel discussion and I want to introduce the directors and guests who are going to be on the panel. I will be a part of the panel. Dr. Lois James is going to be the moderator. This panel discussion was her idea, her conception, and we are going to see that she pulls it off. Next, Director Kitty Scholes, Director Bruce Kramer, President Al Snider, and our guest from Hawaii, Dr. Catherine Cavaletto from the University of Hawaii. Dr. William Storey was unable to make the panel so Dr. Cavaletto graciously consented to sit in his place. Next, Director Karen Lynch.

It has been a long time since we have talked varieties. We want the audience to participate. I am asking you to write your questions on a piece of paper, pass them up front and Dr. James will field them.

By the way, there is an article that will be out in our Yearbook from Dr. Kadman of Israel about the 'Yonik' variety. He sent me some scionwood by mail. I have for sure two of them coming out (of graft).

Before we begin, we will elect Directors to the Board of Directors. I would like the three persons who are running to stand: Karen Lynch, Kitty Scholes, and Lura Ritson. Are there any nominations from the floor?

MEMBER ED HEMMINGS: I would like to make a motion that the three ladies who are running be elected as Directors.

MEMBER KEN DE LONG: Mr. Chairman, I so second the motion.

COOPER: All those in favor? (Chorus of Ayes). It is so done.

I would like to call the panel discussion "The Great Macadamia Shoot-Out." We are in an area where we still need to do a lot more examination, a lot more communication, and grow a lot more trees.

DR. JAMES: The objectives are as follows: we are going to compare varieties by defending and by denouncing, based on our experiences and opinions. The varieties will include those recommended by the people here, recommended by CMS, sold at nurseries, and possibly others. We will mention experimental groves and so-called family groves and single tree selections. We will see if we have any agreement on what is essential in care, and how practical it is to graft and grow your own. My first question:

YOU WILL BE PAID WELL AND HAVE, THEREFORE, ACCEPTED THE JOB OF ESTABLISHING A COMMERCIAL GROVE OF 20 ACRES. THE LOCATION IS IN THIS AREA JUST THE OTHER SIDE OF I-15, AND A LITTLE NORTH OF MISSION. THERE ARE ADJACENT AVOCADO GROVES, AND THE ALTITUDE IS BETWEEN 700 AND 800 FEET. WHAT VARIETY WOULD YOU PLANT? No reasons yet. I am just going to ask which varieties they would plant, and I will start out by asking Tom.

COOPER: Somewhere along the way, some have branded me as a 'Beaumont' grower. If people have been to my place and bought trees from me, we have a heart-to-heart (talk) before we do anything. I discuss all the varieties plus the possible potential future (varieties). The grower ultimately makes his decision.

That area is very rocky, and it is also very steep. This is a pretty difficult question to answer here. Half 'Cate' and half 'Beaumont.'

I have brought some seeds and shells with me. It is called the 'James' variety and we need to ascertain its future as far as precocity. I would like it included in a test planting.

SCHOLES: Well, definitely not 'Beaumont.' I am very happy with the 'Cate' variety and I will stick with it.

SNIDER: I would have to vote for the 'Cate' also.

LYNCH: I would go with the 'Cate.'

JAMES: Now, I would like to know why? It certainly is not very good tasting compared with some of the others.

SCHOLES: As far as the taste is concerned, it is all up to the individual. People have different palates. 'Cate' to me: the advantage is the short harvest. It is thin shelled. As far as producing goes, it grows much faster than the other varieties. The pruning is different from the Hawaiian varieties. We started properly pruning the 'Cate' right off and we don't have that much problem. We will use them for graft wood, and try to get them up off the ground so we can get under the trees to pick up the nuts. It isn't as bad as the Hawaiian varieties.

SNIDER: Well, there are a lot of reasons I would select the 'Cate.' From the marketing end, I have come to treat the 'Cate' like the girl who had a curl that hung on her forehead. When she was good she was very, very good, and when she was bad, she was horrid. And that's a 'Cate.' We have people who have grown a 'Cate' down in the La Mesa-El Cajon area and they were absolutely terrible. I don't know whether it is grower care or watering or fertilizing or something they are not doing or are doing that produces a tremendous percentage of what you would call "immature

nuts." I have had people who have also grown 'Cates' up in the Fallbrook-Rainbow area who, in some years, have produced quite a few of what I would call "immature." The term "immature" means the nut shell is formed all right, but the interior, the nut meat just doesn't develop. It shrivels all up to a hard pea and it is impossible to sell. When the customer buys them and cracks them open, he is one unhappy customer. But, I have also found that these people who have had that experience, when they have gone to better watering, a better fertilizing system, the very next year, the nuts they produced were beautiful. I have had 'Cate' nuts come (to Gold Crown) that were absolutely high in crack-out, good tasting, not rubbery - in general, a first quality nut. You have got to have good grower care because the trees won't do with neglect.

LYNCH: I will have to agree with Al. As far as production, Al and Kitty were remarking they know that it brings the best price. You don't have some of the problems with the 'Cate' that you do with the others (such as) the dropping of the nuts. We are managing a grove now that is a Hawaiian variety and all we do is husk. If they don't readily drop on the ground, that's another problem. We kind of stand with 'Cate' because it does drop from the husk - the majority of them do.

COOPER: I am not convinced that 'Cate' is the ultimate tree. Among other things, Dr. Cavaletto has come out with an article (in which) she makes a comment and I still have to somewhat lean towards that opinion that the integrifolia nut as an edible is still the best nut to eat. The flavor and everything about it is far superior. Growing only tetraphylla in southern California just because it is a very popular item is not an ultimate solution of the problem. I sit on the fence because I am not content that it is the only tree to grow at this time. 'Beaumont' (and 'Cate') are the most popular we have currently. Whatever the case, if you were to come to me, I could train you to train a 'Beaumont' tree where you would be very happy with it. It requires a little work. The ultimate solution to farming is not to stand back and have the dollars fall in a basket. You have to put out a little work up front. And that work means some harvesting care, some pruning, some maintenance, all along the way. All the trees require this. Even the 'Cate' has to be shaken at the end of the harvest period because it holds on to maybe 20%. Other things like rodent theft - the ones that fall to the ground are far more susceptible to rodent theft than nuts that tend to hang on a tree and have to be harvested later.

JAMES: You bring up the rodent question. I have both the integrifolia and tetraphylla. I have almost no rodents - I should say the rodent I am talking about is the Norway rat. The Norway rat does not like integrifolias, in my experience, but it certainly eats all of the tetraphyllas and will take on the hybrids. I have a 'UCLA' and an integrifolia, and the nuts drop right together. The trees are very close to one another. The rats won't touch the integrifolia, but will only touch the tetraphylla.

SNIDER: I had a lot of rat problems, and I have to add another - the crows steal the nuts, too. I find nuts all in the middle of the grove that the crows had picked up and tried to crack and drop. The rats we have in the Fallbrook area are tree rats. They never go down to the ground. They will eat those nuts in the tree and they don't seem to care whether there is a husk on them or not because they will gnaw through the husk and get at the shell. My integrifolias are damaged just as much as the tetraphyllas are by the tree rats.

JAMES: All right. Then we have to worry about rats down here with either species. Tom brought up the point that he believes integrifolia is the best. I have run two panel (tests). One had only five people on it. Three didn't know macadamias at all. We used 12 selections that happened to be available and our top one was 246 and a couple of seedlings. The trouble with 'Beaumont' was the flavor was variable. The next was 'Cate.' I tried our 333 which none of us liked.

COOPER: I would like to go back for a minute if I may? In the 1971 CMS Yearbook was the introduction by Clark Warren and Joe Vicari on the 'Cate' tree. I think you ought to read it yourselves if you haven't. They had big trees that were seven years old when they wrote the article. The popularity today (is) a result of that. In trials - and I'm sure Dr. Cavaletto would agree with me - the trials could extend to sometimes as long as 20 to 25 years.

CAVALETTI: Yes.

COOPER: The 'Cate' variety: a lot of them in some regions take four to six years to bear. In the seventh year, they are barely going as far as both growth and production. They even have these trees listed as up to 37 pounds in the seventh year. 30 to 35 (pounds) would be common on a more mature tree. I (have) 15 eight year old 'Cate' trees that I grew and grafted myself on two year old rootstocks for the total age of 10 years and these trees have not put out much more than seven or eight or ten pounds at the most per different tree. I have soil that is practically impenetrable and I am sure that my trees are 30% smaller than any in an area that has more coarse, fragile soil yet, by the same token, what we are doing is dealing with all of these things in relationship to you as new growers. In most cases, people come and buy property and then want to plant. They don't soil test. Generally, the integrifolias still show a better rating on the percentage of crack-out versus number one, number two, number three kernel.

SCHOLES: Tom, are you saying that the integrifolia has a better crack-out than the tetraphylla?

COOPER: I am going by the statistics in this article in comparison.

SCHOLES: Al Snider has been doing crack-outs for 13 years with every variety we have and I think he can verify whether that would be correct.

SNIDER: Maybe we should review why the 'Cate' was chosen. One of the big problems the Vicari grove had was wind damage. They had 250, maybe more, trees in their grove. About half of them were wiped out by wind. The six 'Cate' trees withstood this wind and this is one of the reasons that they became quite enthusiastic about it - its actual wind resistance. If you were going to select a variety to plant, why do you like 'Cate'? Its wind resistance. It has a short harvest period of about two months. (It is) self-husking. The nut falls free from the husk so you don't have the intensive labor that integrifolias require to husk them. (It has) a relatively thin shell. 'Cate' runs in the 42-45% crack-out whereas the integrifolias will be as low as 25%. We have some integrifolias in the Rainbow area that (have) a crack-out of only about 25%. I grow 'Elimbahs' too. (They) will have as much as a 50% crack-out, even as high as 55%. Their shell is so thin that they are susceptible to insect damage. They are also susceptible to splitting as they mature. This is also a drawback with the 'Beaumonts' because they tend to split on the tree. We think the splitting is from surges of moisture. You think you are watering the tree perfectly and then all of a sudden we will get rain. This happens to citrus too. That surge of moisture causes the tree to have that certain burst of growth and it just splits the shell. From the commercial side, any nut that is cracked you have to cull out because it is susceptible to pest damage and to rancidity. There may be another variety out there that we should keep looking for because I don't say that the 'Cate' is the final answer. But it is a pretty good compromise.

COOPER: I handed out some 'Cate' nuts here today and this gentleman said he didn't know why they were going around. I use the Warren-Vicari ranch to get my scionwood to graft 'Cate'. I am over there frequently and these are samples of the size range on the 'Cate' nut. Everything from tiny all the way up to nice, good-sized nuts. If somebody makes a statement that they all come very big, they don't.

SNIDER: I have to be a further critic of the Warren-Vicari grove. Warren and Vicari used to be extremely good farmers. They have since retired. The nuts they produced when they were really managing the grove and taking care of it were uniform size, all nice, beautiful nuts. Since that time, they really retired and they are trying to sell their place. They don't want to fuss with it anymore. And what has happened? The quality of their nuts has gone down. The crack-out has gone down. I see it in dozens of cases where, for example, a husband and wife grove, the husband dies. The widow doesn't care for the grove, delivers her nuts to the Co-op. In almost a year's time, the quality of those nuts have really depreciated.

LYNCH: We have a grove that we are managing right now for the University of Southern California. It is located in Oceanside. At the time we started taking care of it, it had not been used for two to three years. There were two years of nuts on the ground. The trees hadn't been pruned in over three years and you couldn't even walk through the grove, let alone try to harvest it. The first year we fertilized we had a tree blossom in December and we had a harvest of about 15 trees out of 135. This year we have brought in roughly around 18000 pounds of unhusked nuts.

They are all the Keauhou variety. They don't readily drop on the ground and they have to be husked. The harvest we have had this year, the nuts were enormous. The shells are thin and it is a good quality nut. These trees are 42-years-old and they are producing beautifully, but only because we have gone in and we have harvested all the nuts. We have cleared the ground, and we have fertilized it.

SNIDER: I am very active in the marketing of these things; some of my thinking is prejudiced on the marketing aspect of the (nuts). If I were competing with Hawaii in marketing nut meats I would certainly agree the integrifolia is a better nut to sell. Our logo says "Taste the difference, California grown." They do taste different. The tetraphylla does taste different from the integrifolia; if you are used to integrifolia nuts, they are different. I, too, have run a panel test a couple of times with two integrifolias, three tetraphyllas, and 30 people. It turned out almost equal in terms of preference for taste. But here in California we almost have to sell the nut in shell because of our limited production. 'Cate' nuts, which are easy to crack, you can crack with an ordinary cracker. If you sell integrifolias, particularly these thick-shelled integrifolias, you hear people say "I can't crack them." I must have had hundreds of people who have been to Hawaii, bought Hawaiian nuts, brought them back here to the mainland and said "I can't crack them. How do you crack them?" They hit them with a hammer, put them in a vice, and everything else. They are just impossible to crack. By selling nuts in the shell, this kind of limits some of the things we do. When we get fifty thousand pounds or something like that crop, you almost have to make your produce saleable as an in-shell business. Fifty thousand is our current production and we are trying to compete with Hawaii with 38 million pounds. I would say with a half million pounds - we could then have a cracking facility. It is a completely different ball game when you are dealing with nut meats. Dealing with in-shell nuts, we have a lot of satisfied customers who like the capability of cracking.

JAMES: It has been my experience that people do not like to hand-crack a Macadamia nut. I really have a hard time giving nuts away. The only time that ever worked was when I took two suitcases full back east. They thought it was great and stayed up all night to crack them. But out here I just don't meet people who want to sit and crack nuts.

SNIDER: There are several people around who have crackers and will crack. Kitty Scholes has one. Tom has one. They will crack nuts. The big labor in cracking nuts is the sorting. If you do your own sorting, you have saved a lot there.

COOPER: When the people come by our place, we run them through the cracker and put the cracked shells (and nuts) in a bag and they separate them themselves and eat them. If you don't have a color separator - one of those machines that blow the different particles versus the nut meat away - you are going to take a whole lot of time to separate. Whatever the case, I feel that a moderate concept sort of processing plant should be commenced here soon. The consumers come to

us and they don't want to mess around with them in a shell, just like Dr. James said. They want to pop them in their mouths now. They don't want anything less than that and I am not joking. Some of them will take them in the shell because they have a cracker at home or they want to be clever and see how they can get to them. Generally, the average consumer wants to eat them now. As your industry expands, as your production expands, then expand the modular concept of your processing plant.

SCHOLES: Tom, that is what it is all about. The members of the Gold Crown Association now are expecting, when we get sufficient quantity, to (have a place) where we can cull, dry, crack and everything else.

SNIDER: The nuts Frieda is selling are integrifolias. We sell Frieda the integrifolias that you growers out there deliver to the Co-op. She puts them in eight ounce packages, then ships them all over the country. She is an excellent marketer. We welcome this business. She used to buy them from Hawaii. Her price is competitive with Hawaiian tourist trade.

JAMES: At the present time, you can get more money from the seed nuts than any other type. Do you feel that this is one of your main reasons in selecting 'Cate'?

SNIDER: No. We have welcomed the seed business, but we are quick to emphasize that it is short term business. Seed is just kind of a plus now that we are enjoying, but longer term, I don't think will be there.

COOPER: There is very little tetraphylla that is grown here today that is being consumed and is edible because there is such a competition and demand for the seed in Central America, Mexico, and I am scraping all over the world to get enough to fill my orders. The Co-op is either committed or sold out all the time. If you have your tetraphylla, the price is, in a sense, inflated. By the same token, as long as you can get it you should be happy. This poses another question along with that. When the demand slows down, then you are going to have a tremendous surplus here that you are going to have to market in other areas. Do you process? Do you sell it in shell? How are you going to go?

JAMES: I am going back to 'Cate'. In this selection of 'Cate' you did not mention production, actually. Having been a teacher all my life, I tend to grade trees. I wouldn't give a tree an A grade on production unless it gave 75 to 100 pounds. What kind of production are you getting with 'Cate'?

SCHOLES: My grove: we planted it in 1968. In '76 we re-grafted the whole grove to 'Cate'. Last year I took two trees - with an onion sack under each of these two trees. I didn't pick out one that was full of nuts or full of blooms. Most of these nuts had fallen in the same area and we took the nuts from those two trees. Each tree - I believe one was planted in '71 and grafted in '76 and I think the other was planted in '72 and grafted in '76 - I got about 33 pounds from each tree.

JAMES: That is really saying that we don't have production.

SNIDER: There are trees in Hawaii that produce over 100 pounds per tree. Yet the Hawaiian average is not that great. You can't go on what one tree produces. You need a larger grove, a larger sample than just the evaluation of the one tree. I would hope that we can get the average up. Farming is an averaging business. I'll have an avocado tree that will have 40 boxes off of one tree and right next to it one that will only have one box off the tree. That tree with one box isn't worth watering. Yet the very next year it might be just the reverse. You have to average what your production is in the grove. Off of 50 trees last year, I had about 2000 pounds. My trees are 12 years old. They have been top-worked to 'Cate'. Half of them are still 'Elimbahs' that I haven't cut off. I also have 15 integrifolias (Keauhou) and, 10 'Palomars'. Two thousand pounds on a half acre is not bad yield in terms of what the Co-op pays me. That's a pretty good return. It's a lot better than avocados.

COOPER: Some small root stock that is 18 to 24 months old, you can graft it. This takes three or four years or more for production to start on a tree like that. Caliper at the time of graft has some effect too. When the tree is bigger than my thumb when you graft it, a lot of times the following season you can have nuts on it. It is somewhat relevant to the age of the root stock or the precocity of the root stock or in combination of those two things. In years past, nurserymen have been told by us, the Directors, for the 'Cate' 15 by 20 ft. spacing is alright to plant them. The Warren-Vicari grove now is 21 years since it was planted and that particular grove is planted on a 20 ft. spacing or at least the bulk of it is. Those trees are inter-meshed in excess of three feet. If you don't plant 'Cate' trees on a twenty foot spacing to begin with you are going to run into crowding problems later. As an example of this, (there is) a grove on the other side of Rainbow that is a combination of tetraphylla and integrifolia. The trees are completely enshrouding each other and the trees on the inside do not get any sunlight and they don't have any nuts on them. Only the trees on the perimeter bear.

SNIDER: The Australians have done an extensive study of the shading of the tree and the density of planting. They made an economic evaluation - if you plant them close together when they are younger you will get that much production earlier and therefore help pay for the cost of the grove. But they all preface this with the idea that as it gets older you will ultimately have to take out every other one or diagonally take out every other one. The Hawaiians too have done an extensive work on tree crowding - reduction of production from tree crowding. When your land is \$50,000.00 an acre which it is getting to be in Hawaii, you put them in a little closer. The Hawaiians are now putting them in closer with the idea of thinning them out later.

COOPER: Another thing the Hawaiians have been doing is growing a more upright tree. They grow more upright and are open so that they get more sunlight throughout the whole tree. As a result, this encourages production throughout the whole tree. Tree shape, sunlight effect, humidity and temperature all have a relative bearing on the overall productivity of each tree.

KRAMER: I would like to ask the people here who have 'Cates' to give us some feedback as to what your altitude is, how you are taking care of your grove, and so forth so that we can come up with some answer on productivity for various altitudes.

QUESTIONS FROM THE AUDIENCE.

HAS ANY ADVANTAGE BEEN SHOWN BY USING MORE VIGOROUS INTEGRIFOLIA ROOT STOCK TO GROW TETRAPHYLLA SCION?

JAMES: A tetraphylla root stock is better able to take up the nutrient needed. You should not put tetraphylla on integrifolia because integrifolia does not take up the nutrient that tetraphylla needs. You could use an integrifolia root stock - if you are going to put on an integrifolia scion.

MEMBER PAUL THOMSON: This business about root stock is something that there has very little work been done on. Dan Langston here has a place which has some rather heavy soil in it and his next door neighbor, Frank Fisher, has some soil which is quite heavy too. In the planting, they have both tetraphylla, integrifolia, and hybrid root stocks. It is very evident the integrifolia is far superior in heavy clay-type soils than tetraphyllas. Where you have heavy soils, tetraphylla is not superior and not suitable. The integrifolias may not be the best root stock, but if they grow in heavy soil, which they are better adapted to, they are going to be the best root stock. Tetraphyllas just won't do it - not in heavy soil.

MEMBER JACK AHLISWEDE: The results of my work has always been in growing cuttings. I am well aware of the shortcomings of cuttings in the early years because you don't have quite as deep an anchor. The variability of the seedling makes you have a pretty unreliable situation. I am playing with growing 'Beaumonts' on its own roots and grafting it to the various varieties. I found they make excellent trees on their own roots - the 'Beaumont' does. Lois, do you find the 'Beaumont' which is a hybrid is very good at picking up a nutrient?

JAMES: You have asked the wrong person because I dislike the 'Beaumont' intensely. It is a very poor competitor, therefore it is a very poor ground tree. From my observation and dealing with only about 9 varieties, it is the poorest of all in competing. Whenever it gets up against something, it dies on that side. A lot of these others just grow right into it. There are many pre-drops. The nut tends to divide. There are a lot of halves produced but that is not a serious problem. There is a lot of shrinkage although the oil is reported as being between 70 and 75 percent.

The flavor is variable and I am very particular about flavor. There are a lot of unexpected immature nuts and the nuts are quite variable in size.

AHLWEDE: It is an excellent grower. This is why I am using it as a root stock because it is very tolerant to a different type of soil which so many of them aren't.

JAMES: I have seen three of your 'Beaumonts' and they are beautiful.

COOPER: We were talking about root stock and I have a few things to say about root stock. It seemed that there was a greater degree of compatibility of putting anything on top of tetraphylla root stock as compared to using integrifolia. Integrifolia turned out to be incompatible a lot of times - primarily to tetraphylla. The top would grow so fast that it would outgrow the tree below it and you would have such a top-heavy tree that you would have to go in and arch graft that tree to give it support. I don't know where Warren & Vicari got their trees, but at the present time, their whole grove of 'Cates' has this particular problem. They have a man that is doing an experiment of arch grafting to support these trees.

THOMSON: You have an intra stock which is integrifolia and that is the one that is touchy to the wind. They had all kinds of root stock for the grove and they grafted whatever nuts grew.

COOPER: In Central America we are selling practically all of our tetraphylla seeds to them because of this opinion that tetraphylla root stock was the best root stock and then you could graft anything on top of it. That is why the demand at this time for all of our tetraphylla seed. You go down there and look. Integrifolia seedlings that were seven months old that were standing no more than eight inches in height. There is considerable more vigor in the tetraphyllas as a root stock. We have tetraphylla seedlings that we grew in 90 days from germination that were already standing a foot tall.

AHLWEDE: I would like to ask the Dr. - what are they using on the island of Hawaii as understock for their growing integrifolia?

CAVALETTO: That is really not my area, but as far as I know, essentially everything is growing on integrifolia. Incompatibility, yes. There have been some studies done in Hawaii that have looked at this question. But, as far as I know, they are somewhat inconclusive. I think the general opinion of horticulturists today is that you put tetraphylla on tetraphylla and integrifolia on integrifolia.

SNIDER: Let me add something to that. An expert over there in Hawaii has been all over the world telling everybody he used tetraphylla seeds. For that reason, we sell a lot of tetraphylla seeds. When you go to a lot of these countries - I don't care whether it is Brazil, Paraguay, Central America, South Africa - they all use tetraphylla because that is what the Hawaiians told them to use. Even Dr. Storey years ago put an article in the Yearbook that said to use tetraphylla seed as a root stock.

CAVALETTO: I think that there are both schools of thought in Hawaii.

JAMES: One of the things that I think you need to keep in mind is that you are not producing trees, but you are producing nuts. You have to think about that final product. When you are getting a vigorous tree, that is fine, but if it doesn't produce very nice nuts and it doesn't produce good quality, then you really haven't gained anything. Where are you going to market those nuts? If you are marketing the nuts in shell then the situation is quite different than if you are marketing kernels. If you are marketing the kernels, are you buying for roasting or going out as raw kernels? These questions are all important when you are looking at selection of variety.

SNIDER: If you do have two different varieties, you should keep them (nut meats) separate because mixing them is a real problem in roasting. They roast differently. Hawaii is committed to integrifolia. They almost have to have all integrifolias because they are faced with roasting them. If you are going to mix them with tetraphyllas, they have a higher sugar content and they will scorch at a lower temperature than the integrifolia will.

WHAT BEARING DOES THE ROOT STOCK HAVE ON THE ULTIMATE GROWTH AND REPRODUCTION OF THE TREE IN RELATION TO SOIL TYPE - ESPECIALLY HEAVY CLAY?

JAMES: Paul Thomson just made the remark that tetraphyllas do not do well in heavy clay. I live in Puente Hills and that clay is really good for macadamias.

SNIDER: Including tetraphyllas? Well, there is apparently a problem in the El Cajon-La Mesa area because the tetraphyllas just don't do well in that area. It is supposedly an area of heavy soil. The heavy soil is really a problem when it comes to watering - it holds the water longer, but it is harder to penetrate to get enough water to feed the tree and they need a lot of water.

COOPER: I have 30 feet of clay, real adobe. I have been working in it, trying to amend it along the way with gypsum. Four or five years after acquiring my property, I planted an acre of tetraphylla seedlings and about 125 more seedlings on the other side of my property, which was 10 years ago. Two years after I planted them I grafted them. They are all in the same heavy clay soil and they are tending to do fairly well. I am not starting to wave a flag or anything, but my 'Beaumont' trees are twice and three times the size of any of the tetraphyllas in the grove. I have a whole selection of tetraphyllas. All of my tetraphyllas are very small. Integrifolias that I bought from Col. Wells Miller, and I don't know what the root stock on those was, but the biggest trees in my grove next to my eight-year-old 'Beaumonts' are 14-year-old 660's and 246's.

WHAT ARE THE ADVANTAGES OF 'ELIMBAH' AS COMPARED TO 'CATE'?

Handwritten signature and scribbles.

JAMES: I don't know of any.

COOPER: The 'Elimbah' is much harder to graft.

JAMES: The 'Elimbah' gets moldy. It splits open. It has a long drop period.

SNIDER: 'Elimbahs' are great nuts if you don't mind picking them about eight months of the year. For this reason, I have grafted all of my 'Elimbahs' over to 'Cates'.

COOPER: I will tell you what you can do with your 'Elimbahs'. You can take them all off the tree about the first week in February, and in husks, bring them in a bag to my place and I will buy them from you and use them for root stock. They are ready to be taken off of the tree the first week in February.

JAMES: They even start being root stock on the tree.

THOMSON: The same nuts - the 'Elimbah' root stock - many of them I purchased from you, and they had the worst performance of any of them.

JAMES: Many years ago, Paul Thomson did some grafting for me. He grafted a 246 and an 'Elimbah' on the same tree. For many years I had a nice round 246 on the bottom and up on the top, which grew taller, was the 'Elimbah'. Now the 246 is taking over and involves about 3/4 of the tree. The poor 'Elimbah' is only on one corner. The 246 is completely outgrowing the 'Elimbah'.

WHAT ARE THE EFFECTS OF ALTITUDE? WHAT ARE MAXIMUM AND MINIMUM TEMPERATURES?

SNIDER: Read the Yearbook. There is an excellent article by Australians who have done a study on the effect of temperature. They find that above about 33 degrees C. the tree just quits growing and below about 10 degrees C. the tree quits growing. Temperature is a significant factor in growing.

JAMES: I think it is 75 degrees F. for vegetative growth. Unfortunately for us, the integrifolias have a requirement of temperature above a certain amount for a certain number of days for nut and oil development which tetraphylla doesn't. Now that would be one of the advantages of finding an integrifolia that didn't have that temperature requirement. Possibly we can get it just by chance or we can get it by using the hybrid and hoping that it is the dominant characteristic. I think it is a dominant characteristic just because of the hybrids. Possibly if we cross hybrid back with the integrifolia we will come up with something.

SNIDER: The 'Cate' doesn't do well along the coast. There is an elevation problem just as Hawaii has found. Hawaii has found that some integrifolias are better suited for the higher elevations.

COOPER: Dr. Gordon Shigeura in Hilo, Hawaii, wrote an article in the Yearbook about two years ago about the relative heat and humidity, the combination, and elevation. Through the pass from Waimea to Kona, there is a spot that is 2000 ft. in elevation and integrifolias grow, but don't produce. Tetraphyllas grow and produce well. Their latest introduction, 741, is recommended for the higher elevations and their 800 is recommended for the lower elevations, the ones nearer to the coast. In Costa Rica, they are planted more on the intermediate slopes, anywhere from 500 ft. up to 4000 ft. It doesn't cool off at night down there like it does in Hawaii. The consequence is that they have about a ten to 15 degree temperature differential in Central American mountain ranges, aside from the volcano peaks themselves. In Hawaii, there is a prevailing cool-off at night because all that cold air drains down and in the day time heat rises back up.

CAVALETTO: That is right.

THOMSON: It is all well and good to talk about the performance of the macadamias in Hawaii and in Central America, but we are not interested in that. We are interested in California macadamias and I would like to say a word about that. It so happens that atmosphere thins out the higher you get. Along the coast, at lower elevations, you have a very protective cover of air which moderates the climate and keeps it warmer. The integrifolia is doing much better along the coast because they don't have the variability of temperature. The farther inland and the higher you get, the less air there is, nights cool off much faster. The tree wants to protect itself by making a bigger shell around the nut. As result of this trying to protect itself, you have probably a ten percent thicker shell or a drop of ten percent in crack-out percentage at the higher elevation. From my experience, 'Cate' is less effected by the elevation than any of the integrifolias. I have found 'Palomar' to be quite good in some of the interior areas and effected the least of any of the integrifolias. I did a grafting job for a Macadamia grove at the elevation of 2200 ft. which is higher than any other grove that I am aware of at the present time. Whether or not that is going to be successful it will be interesting to watch and see. If you can get within an 800 - not over a 1000 ft., you are going to have far better production, better crack-out, and higher quality nuts than any other place that I know of. I noted that around Warren & Vicari's grove that there was another grove near there about the same elevation. The 'Elimbah' variety there dropped down to 25% Grade One whereas along the coast it was running 100% Grade Ones. 'Beaumont' was also effected very seriously by elevation. The 'Cate' variety was one of the varieties that held up in quality and size and production at that particular location which was about 1000 ft.

WHY TWINS?

JAMES: In the ovary of the flower, there are two ovules. So macadamias start out as two in each one, but generally one aborts. Aborting occurs at different ages and varieties, and even within the same variety. In 'Beaumont' very often you see a little tiny crater on the shell and if you look on the husk you can see the twin. It aborted very early. What we really want, of course, is for abortion to take place very early so that you would have one round nut.

DOES WATERING MACADAMIAS DIFFER FROM WATERING THE AVOCADOS - EITHER MINI SPRAY OR DRIP?

SNIDER: Kitty changed hers from spitters to mini sprinklers. She thought her trees looked better. I looked at what she was doing and thought the trees looked great. So I put in mini sprinklers and I think that there is something to be said for them. They do put the water over a wider area and you don't get the run-off. They soak in nice and gently and I think that it is an efficient way of using water.

COOPER: From my observation, it appears that the Macadamia trees like to have a moist field to the leaf line and not flood irrigate it. The wetting of the field under the tree seems to be the clue as I see it. In conjunction with this, this past year I heard of people having an early drop of their nuts. I investigated and found that usually these people water once a week or once every two weeks and flood it. I believe this is an improper maintenance of soil moisture. By watering regularly, my trees had practically no drop at the initial fruit set. Throughout the whole year, they didn't drop. The water maintenance, I feel, was handled correctly or well enough that the tree didn't have competition for the demands of the tree and the root system compared to the formation of the nut.

MEMBER PAUL SHAW: California Farmer had an article in there about three or four months ago in regards to drip systems which I have been predicting all the time. I hope that people are not all going to go to the drip system and find out in 10 years that they have such a salt and alkaline build up that they can't grow anything. This is what the article says - that they have a tremendous salt and alkaline build up in the area of the drip system and the reason is it is so unnatural and there is no flush out of the alkaline and the salt. Thank you.

SCHOLLES: We originally started with half spitters watering about an hour a week. We did have very immature growth so we put in tensiometers and noticed we were not giving them enough water. With the reading of the tensiometers now we know when to water and how much we have to water.

HOW MANY TIMES PER YEAR TO FERTILIZE?

SCHOLLES: For granular, the Australian article in our Yearbook suggested three times for five year old trees and over - April, July, October (for us Jan., April and Oct.). Sounds good to me. A three pound coffee can will contain about five pounds of granular fertilizer.

SNIDER: You also don't want to put that volume on a small tree.

SCHOLLES: No. Use less on smaller trees and what you do is spread it out. You don't just dump it right at the trunk. Broadcast around the tree. ✓

SNIDER: Most of our avocado growers fertilize their trees twice a year. We do the macadamias the same time that we do the avocados. We had a grower in Santa Fe - he is since deceased. But he used to bring in some of the best nuts. I don't care what the variety was - whether it was 246 or 'Burdicks' or 'Beaumonts' or 'Elimbahs'. He used to bring in 'Elimbahs' that had a 57% crack-out and I asked him once about what he did. He fertilized every month. But he took what he would give them a year and he would divide it up just every month. And he had beautiful looking trees and beautiful quality nuts. I would think that it would be ideal to fertilize every month. To me, a tree likes a steady diet rather than all of a sudden, and then starving for six months. ✓

COOPER: I invested in a proportioner. To me, this seems to be the simplest because it is in liquid form and it goes right to the roots. There is a dial on the machine where you can set it as little as 200 parts to one, and have had good results out of it. The Macadamia can not tolerate real concentrated doses of fertilizer at one given time. Dilution seems to be the key. If you use granular fertilizer, you have got to get it in solution promptly. If you don't, you have chemical changes, you have oxidation that takes place too. Liquid infusion, to me, is a more plausible technique.

HOW ABOUT YOUNG TREES, ONE - TWO - THREE YEARS OLD, SIDE BY SIDE, TREATED THE SAME, SOME DOING VERY GOOD, SOME YELLOW WITH YELLOW LEAVES, SOME LEAVES DEAD AT TIPS, LARGE DIFFERENCES IN THE SIZE OF THE TREES?

JAMES: If it is a seedling, the answer is pretty obvious because trees are variable. If they are a grafted tree, who would like to answer it?

COOPER: I think the article that is in the L.A. Times Home section this past Sunday says one of the killers of young trees was over-watering especially if they are in heavy soil.

HOW ABOUT INSECTS?

SNIDER: The Southern Green Stink Bug was at one time quite a problem in Hawaii. Keep the vegetative growth like weeds and that down because the stink bug seems to like to live in the vegetative growth that surround the trees. Then when they dry out, they will migrate into your grove. They have a proboscis that will go through the shell, mind you, and actually feed on the nut meat inside. This marks the nuts - so they have a black mark on them - when the nut is cracked, you have this awful

looking piece of nut meat that has all of these little black spots on it. I have eaten them and they are not bad, but visually, they spoil the nut. Most people that I have known who have had this problem have had a lot of weed growth around their groves. The Navel Orange Worm is another pest. It will actually drill a hole through the shell. It is a little brown moth that flies around and is very prevalent. Although it is called a Navel Orange Worm, it goes into everything. The problem with it is, if there is the slightest crack in the shell, it will lay an egg. That egg then becomes a worm, damaging the nut.

JAMES: We notice that in the 'UCLA' variety, which has an extremely hard shell, the worms go in with the greatest of ease right through the shell. In the 'Santa Ana' all they do is go into the husk and just chew the husk to pieces. I have very rarely found a worm inside of a 'Santa Ana'.

COOPER: I bought some nuts once from other growers and they had these Navel Orange Worms. They scared me because my grove had been pretty well cleaned up until that time. I didn't spray, didn't use any herbicides or pesticides at my place. Just tried to keep the place as clean as I could. Amazingly enough, in my barn where this particular problem occurred, it had a lot of spiders, a lot of webs. I noticed that later in the summer, there was a tremendous amount of them (moths) that had been trapped in these spider webs.

WE HAVE TWO-YEAR-OLD 'BEAUMONT' CUTTINGS PLANTED IN A WINDY CLIMATE AND THE TREE LOOKS LIKE THIS. THEY HAVE GOT THIS . . . AND THEN ALL BRANCHES COMING OUT FROM ONE POINT. WHEN AND HOW WOULD YOU PRUNE THESE TREES?

JAMES: I would urge anyone who is pruning trees to read "Macadamia Nut Tree Pruning" in the 1960 Yearbook. It is the only good article that we have on pruning.

COOPER: First off, just from what I've seen working with a seedling - if you top a seedling, the trunk thickens up and it will throw new growth. Cut off about 50% of the top growth and let it thicken up, stiffen itself up, and then form its new structuring of the actual tree. You could put stakes up but you want to put them at least three ft. away from the tree. Don't interfere with the foliage of the tree. Put the tape up wind, and tie the tree so that when the wind blows, the tape is flexible.

USING ONE HUNDRED PERCENT AS PERFECT GROWTH MANAGEMENT, RATE THE FOLLOWING AS CONTRIBUTING TO THE PERFECT TEN. WATERING, FERTILIZER, PEST CONTROL, PRUNING, AND OTHER.

JAMES: My opinion would be that watering was most important. Pest control may be first, and watering second, and pruning last.

SNIDER: They are all important; depending on the degree you do them - your tree will respond.

JAMES: Now this one asks for a comparison between 'Cate' and 'Beaumont', and please put it on the blackboard. I have some 'Cates' that came into production at about 2200 ft. I have had 'Beaumonts' in production at 2200 ft. It is probably dependent upon root stock. Integrifolia as a whole is more frost resistant than the tetraphylla - the maximum amount we found is two degrees. I think they are both pretty good at high elevations.

COOPER: As Paul said, at about 2200 ft. there is an acre of 'Cate' trees and that is as high as we know of at this time.

JAMES: What about low elevation?

COOPER: The original tree that I saw was on Balboa Island growing in the sand. I have seen a 'Beaumont' growing in the sand on the beach. I haven't seen a 'Cate' growing in the sand on the beach.

MEMBER MONTY WARD: We have 'Cates' and 'Beaumonts' at 250 ft., 3/4 of a mile inland from the ocean. 'Beaumonts' grow about twice as fast.

COOPER: As a matter of fact, over at Carlsbad at Elwood Trask's, who had his trees growing right alongside the railroad on the bluff at the ocean, he had a little bit of everything growing in there.

IS WIND A FACTOR IN THE 'CATE' OR 'BEAUMONT'?

WARD: Say 'Cate' is good for high and 'Beaumont' is good for low.

COOPER: The 'Beaumonts' up at 2200 ft. are really loaded this year. Dr. James has a 'Beaumont' tree that puts out little bitty nuts and she has been complaining about it for years. But she comes over to my grove and my grove puts out very big nuts. I think the secret is maintenance rather than anything else.

JAMES: You don't have a tree that is more than 100 pounds; I have.

COOPER: Everything she does is more productive than mine.

SNIDER: I have known growers of 'Beaumonts' too that say they do produce a lot of little nuts. Like Tom says, I suspect that it is the grower's care.

GROWTH RATE?

SNIDER: About the same.

COOPER: In the earlier years, the 'Beaumont' is more precocious. It will usually come into bearing sooner.

JAMES: 'Beaumont'?

COOPER: I have a rooted cutting of a 'Beaumont' that I started rooting last fall and it has thrown flowers out. It hasn't thrown any leaves.

JAMES: Years to produce? 'Cate' produces faster.

COOPER: It doesn't.

SNIDER: Sometimes you get a 'Beaumont' that bears really early, but then you get a 'Cate' that bears really early. The 'Cate' has a little thinner shell, a little higher crack-out, generally 42 to 45% whereas the 'Beaumonts' only run in the 30 to 35% range.

SNIDER: I say they are about the same as far as ease of cracking.

SPEAKER FROM THE FLOOR: I have a good 'Beaumont' and about 1/2 of them crack on their own.

JAMES: Nut drop. There is no comparison. 'Cates' drop within two weeks.

SNIDER: In my experience, you can't go out and pick 'Beaumont' nuts because they tend to flower three or four times a year.

COOPER: We picked this year just as the flower started to emerge and I have 125 'Beaumonts' out of 300 other type. It took 2½ days to pick. They used pruning shears and ladders and they just cut the nuts off and didn't break the flowers off.

JAMES: Concerning the production, I don't think we can answer that. We just don't have the data yet.

SPEAKER FROM THE FLOOR: If they were the same age, what would it be?

JAMES: The only comparisons that have been made are quite unfair; comparing two trees of different ages.

COOPER: The oldest 'Cate' tree I have is 11 years old, and is from scion wood from the original 'Cate' tree. I grafted out another 15 of them and they are only eight years old right now. I am getting from as little as three pounds a tree to no higher than 12 to 15 pounds on those eight year olds.

CAVALETTO: Generally, we are looking for 5000 to 6000 pounds per acre.

COOPER: That is what Masa Nakamura, who is vice president of Mauna Loa, told me. He said five is their target - 5000 pounds per acre.

CAVALETTO: In Hawaii, it depends on the location. In the Kona area of the island of Hawaii, the west side of the island, the trees are very, very productive.

COOPER: In Southern California, I think, from what I have seen 30 pounds is good. I think you need at least 30 pounds to come out on a chart.

SNIDER: Are they self-pollinating? I have been telling people for years that they are self-pollinating. Simply because the male-female flower are on the same stem, you think "Well, who needs another one?" But if you have an isolated tree, apparently sometimes they will not bear.

KRAMER: I know of two different 'Beaumont' trees that are well-isolated. One produces a crop. The other one is at the San Diego Zoo. It has lots of blossoms, they tell me, but it has never produced a nut since they put in the Zoo.

MEMBER SID BOWMAN: If I have two 'Beaumont' Macadamia trees that are purchased from different places and I have them in my yard, are they going to pollinate each other?

SNIDER: Probably. Are we going to talk about chlorosis?

JAMES: Some chlorosis is hereditary and some is lime-induced. So you get an iron deficiency. There is a lot of hereditary chlorosis because the process of photosynthesis is very complicated and it involves a lot of enzymes. A mutation on just one enzyme can cause chlorosis. Sometimes you can take a chlorotic seedling and graft it and it just does very well. Other times, it doesn't. It would depend on what is causing the chlorosis.

COOPER: From Dr. James' Whittier property is an integrifolia. It is a thin shell integrifolia and everything Lois tells us about it is correct. It has dropped all its nuts in one week. They have a consistent uniformity to them. They are a very beautiful nut. I grafted some of these and I am going to have some available. This tree has to be planted all over southern California from as far north as we can get to the Mexican border. It very possibly will be a new introduction to California.

JAMES: I am not as excited about this as Tom is because we don't have enough information on it yet.

BOWMAN: You can try it on mine.

CAVALETTO: Generally the tetraphylla are higher in sugar content and that is the reason that they roast darker. The temperature needs to be adjusted for that higher sugar content. There is, generally, a higher oil content also. We have only done a very limited amount of work with roasting of the tetraphyllas. I think there is still the argument that if we had spent as much time and energy in develop-

Paul

ing a variety of tetrphylla as we have varieties of integrifolias that we knew that we would have them because I think we have seen a variety of tetrphylla that look much better than what we ever had in Hawaii. The two species should be processed separately.

SPEAKER FROM THE FLOOR: What temperature do you use when you roast them?

CAVALETTO: For the oil roasting, they use about 275 F. for anywhere from ten to 15 minutes depending on the type of roaster that is used. With dry roasting, the temperatures can be quite variable depending on the design of the roaster.

THOMSON: Years ago when Col. Miller was buying the nuts from any and all, he had quite a few at that time of 'Burdick' nuts. He was selling them to the Morro Brothers Nut House which had a chain in Los Angeles and San Diego. They finally decided that "if you will bring us 'Burdick' nuts, we will buy them." They roasted them and they had an excellent product. They sold well. They only wanted 'Burdick' because that was the one that roasted best. I was in Australia a year and a half ago, or so. A large grower of macadamias there handed out samples to some of us of tetrphyllas and integrifolias. The consensus was 100% that the tetrphyllas were far superior in flavor and quality to any of the integrifolias.

JAMES: Now you can see why there have been no reports in the Yearbook concerning varieties for several years.

SNIDER: Most of our customers are people who like the raw product. In fact, our in-shell business really thrives on the fact that there is a health food industry out there who likes unprocessed, unsalted, no anti-oxidant and all that sort of thing.

SHAW: We dry roast all of our nuts and have for years. We turn the oven to 400 degrees with four pounds for 20 minutes. We take them out and they are good for months.

SNIDER: That is pretty high, Paul. I think you have got to watch them real close.

SHAW: Look. I do it, and I have done it for years, and it works. It is a rotor. People put them on cookie sheets - that is no way to go.

COOPER: If that is the prescription temperature, other people's ovens may not be exactly what their thermostat is set at.

SHAW: Now, they are not 400 degrees for 20 minutes because I have to get them warmed up. There is the probability that they would never get to 400 degrees because they don't have time. This is the way we have done it and we have had

Paul

Paul

Paul

more remarks on our nuts being the best nuts they have ever tasted. When we roasted the tetrphyllas, we may have to pick out half a cup of dark nuts that are darker. They are not a uniform color like the integrifolias. The integrifolias come out very, very nice and very uniform. The tetrphyllas are not uniform.

CAVALETTO: When you are roasting in that type oven, rotating, they are not all receiving that 400 degrees heat directly at the same time. I think if you measured the final roast, the final temperature that Paul is talking about sounds in order.

COOPER: Paul Shaw has just come up with a new model of his cracker over here to my right. If you will take a look at that, it is one that we poor folks can afford now. It would get you into the crack-nut business.

That will conclude this part of the meeting. Thank you.



CMS New Nursery Committee Members attended a special field trip during the year. (L. to R) Tom Cooper, John Stevenson, Charlotte Hotchkiss, Art Lynch, Karen Lynch, Oliver Atkins, Bob Zuckerman, Larry Dalen, and Joe Lopez.

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