

## Variety Observations Following the Freeze Questions and Answers

*(Eighth Annual Avocado Institute)*

**H. H. Gardner:** A year and a half ago, when we met here, we had a full program and not enough time for questions and answers. You will remember that, having a stack of written questions and only twenty minutes to answer them, I was censured for having to shoot them through—but otherwise I couldn't have handled them at all. We made an effort this time to provide plenty of time for discussion and questions from the floor during the meeting. I have talked with the speakers this morning and it will be all right to wedge your questions into their talks and those who don't want to, can write their questions, and they will be answered just before lunch.

Our first item on the program will be in the nature of a symposium— on Variety Observations following the Freeze, with Elwood Trask, H. E. Marsh and H. B. Griswold speaking. They are the chairmen of the Variety Committees in the different counties and that part of the program will be under the supervision of Carter Barrett, who is chairman of the Variety Committee of the California Avocado Association. Mr. Barrett, will you please come up here and regulate your speakers?

### THE VARIETY COMMITTEE

**Carter Barrett:** The California Avocado Association has a committee which is composed of two or three of its directors, and representatives of the University of California, the United States Department of Agriculture and other similar organizations. Then in addition to that on that Committee sits the Chairmen of the Variety Committees of avocado growing counties. These are the men who are responsible for most of the actual field work that we are accomplishing today. They have their local committees operating out of each organization. Then in addition to that on that Committee sits the Chairmen of the Variety Committee of avocado growing counties. These are the men who are responsible for most of the actual field work that we are accomplishing today. They have their local committee operating out of each county, taking field trips, discussing problems, etc., and they get together two or three times a year and go over the information that has been gathered and try to correlate it. We will first call on San Diego county. It is the largest in acreage and I presume production also. Mr. Elwood Trask will present his information. Elwood Trask of Carlsbad.

**Elwood Trask:** Ladies and Gentlemen: I am not going to stick entirely to this matter of varieties. I think perhaps you are all interested in the reaction of avocados in San Diego to the freeze, so I am just going to step over the county and make a few remarks about the reaction within the various sections of San Diego county. In San Diego county we have two distinct climatic conditions and perhaps we might divide that into three-coastal,

intermediate (which is called intermediate-coastal) and the interior section which is not quite the same as we would consider the interior section of San Bernardino and Riverside but it is hardly the same as coastal-intermediate section.

## **EFFECTS IN SAN DIEGO COUNTY**

On the coast we found that the freeze affected the trees peculiarly— there were some sections in which we might say no damage whatsoever.

There were some of the more tender varieties injured to a small extent. Just a few miles away, no difference in condition—even Fuertes were badly hurt. Then when we go to the intermediate coastal section such as Vista, La Mesa, Rancho Santa Fe, we find there in some of the lower spots the frost was very severe. Many orchards cut back practically to the ground, but just a few hundred feet distant orchards, apparently with equal care and comparable soils went through the freeze with very little damage.

Getting back farther inland to the Escondido and El Cajon districts, we find the same conditions holding there—favored spots where there was no injury and just a short distance away trees and orchards badly injured. Of course, as you all know the varieties were affected differently. On the coast, perhaps 50% are summer varieties—Dickinson and Anaheim being the predominating varieties with Fuerte with many of the lesser varieties making up the balance of the 50%. Of these varieties the Anaheim was undoubtedly the most severely injured. Even in sections where there was little or no frost damage, there was indication of damage on the Anaheims.

The Dickinson was next in severity of injury, being hurt more than Fuerte which stood a little more of the cold. Anaheims, Nabals, Dickinsons quite badly injured—the Fuerte went through, holding the crop on the tree. In the intermediate section the same thing held true with a greater degree of injury on Guatemalan varieties. In the interior sections most favored location the Guatemalan received some injury. Very few places where there was very much of the Guatemalan fruit saved. I have seen groves where Fuertes were apparently not injured at all—occasionally fruit with dark stems and limbs killed back to main trunk, thus showing a difference in ability to withstand cold between adjacent trees.

## **RESULTS AND TOP-WORKING**

Of course you are interested in what we are doing with these frozen trees. In general, in the intermediate sections and inland section, the Guatemalans are being topworked to Fuertes; little or no topworking is being done to other varieties. Some have Nabals topworked but in general most of the growers are leaving their Nabals to carry on for summer fruit. Many are topworking Pueblas and most growers are taking the opportunity to topwork odd varieties through the groves, these generally to Fuerte.

Along the coast it is a little different. The Fuerte has not been a profitable variety along the coast and for that reason topworking is being done mostly where there are odd varieties which have not proven satisfactory, such as Panchoy, they are being topworked principally to Anaheims. Most of the topworking being done is to Anaheims.

As a result of this freeze, we are of course interested in the crop to be expected for the coming year. In my observations on the committee, I believe there will be little change in crop in the coming year due to the fact that trees which were not injured are producing very heavy crops. The orchards which were mildly injured are producing some fruit and the outlook for the coming year, in all probability, is an increased crop.

Thank you, Mr. Trask. Has anybody any question which they want to ask Mr. Trask?

Q. Does "by the coming crop" mean this winter or do you mean the crop setting next spring?

**Elwood Trask:** I mean blossoms. I meant the crop for next year. The crop next year will be a little heavier than this year.

**Carter Barrett:** I want to say this. The hardworking chairman of San Diego County, Mr. Hazzard, is not on our program. He is suffering from poison oak and he asked that Trask speak for him. I would like to have Mr. Hazzard stand up and take a bow anyway.

## **ORANGE COUNTY—ONE ZONE**

Now I am going to come up the coast and call on our Orange County chairman—Mr. Harry Marsh. The fact of the matter is, folks, he probably knows as much about San Diego as he does about Orange County but he is going to give some interesting sidelights on Orange County.

**Harry Marsh:** What Carter said is true in a way. Mr. Trask takes most of my thunder when he reports on San Diego county; although I live in La Habra, my principal work is in San Diego county and I spend most of my time down there. Our problem in Orange County is considerably simpler than that in San Diego county because we do not have the wide climatic range that we have in San Diego county. Most of our orchards are practically in one zone; intermediate zone and for that reason the observations on one orchard go pretty well for all the rest of them.

We have been wondering just what a good freeze would do and some were almost wishing for it to see what would happen—well this year we got it.

In general, the situation regarding varieties is just about what Mr. Trask has said regarding San Diego county. The Guatemalans—hard shelled varieties—suffered the worst, and head of the list we must put Anaheim, Nabal coming very closely behind, and we do not have quite so many of the Guatemalans to observe here, but in general they fall pretty well into one class. They were hit pretty hard where some of the other varieties escaped.

There is conflict of opinion whether the next class should be called hybrids or not—Fuerte and Ryan—but at any rate they are in an "intermediate class"—thicker skin and different season and they seem to fall in one class largely in frost resistance; no great difference in the way they have reacted to cold. We had expected that the Puebla would be ever so much more resistant than the Fuerte but that has not appeared to be the case. Pueblas did a little better in some locations and in others the Fuerte; and I understand the same situation is true for the Ryan and possibly the Leucadia. The Mexican varieties, as we expected, stood the frost better than the Guatemalans. It

wasn't anything uncommon to see a Mexican tree very badly hit recover and bloom and set a good crop. I think that the range of damage has been a little bit unexpected to most of us. He knew, of course, the Mexicans were tough and the Guatemalans tender but we didn't expect the wide range. In some of the orchards, young Mexican avocado trees that were pretty badly hit were almost defoliated but came through with a good crop—whereas large, old Guatemalans under same conditions were killed almost to the ground.

## **EFFECTS ON NEW VARIETIES**

It may be of interest to mention some of the newer varieties. They are the ones to review, in particular, since we are continually looking for better varieties. The Isabella, which a great many of you have heard about, is a Fuerte-like fruit, probably of about the same class as Fuerte, but a little larger, but very much like Fuerte in appearance. It comes into maturity after the Fuerte and we are hoping that it will give us a continuance of Fuerte-like fruit during the summer. Isabella reacted very much like the Fuerte did. We couldn't tell any great difference. I mentioned that the Guatemalans, in general, were pretty hard hit. There was some variation between them, of course. I did observe one purple Guatemalan that we have been neglecting for some time although we considered it of promise; it did seem to stand frost better than most Guatemalans. Probably a great many of you have never heard much about it—the Frey. The old, original Frey tree is something like twenty-two years old now. It has been a very consistent bearer, approaching almost the regularity of the Anaheim in setting good crops, year after year. This fruit comes in the late spring and carries over in extreme cases until October and November. It weighs about a pound and is a very vigorous grower—young trees grafted from this parent tree doing splendidly and did better than any other Guatemalan in the immediate vicinity.

Regarding the Mexicans. There were very few cases where we were able to observe any large number of Mexican trees but it has been observed that they all seem to stand the frost to about the same degree. I was interested in observing Mr. Henry's orchard at Escondido, where Fuertes and Nabals suffered badly but the Mexican varieties came through in nice shape with a good crop.

**Carter Barrett:** Is there anything you wish to ask?

## **PUEBLAS BEING TOP-WORKED**

Q. May I ask Mr. Trask a question? He spoke of Puebla being topworked to Fuertes. Is that on account of susceptibility to cold or the color of the fruit?

A. (Trask) I think most of the growers in San Diego county have found that the Pueblas, as they get eight or ten years old or older, are not satisfactory—producing a larger quantity of small fruit and we had some trouble on account of the size; not the color. In occasional years they have some internal trouble. Also they were less hardy than the Fuerte this year. Puebla suffered more than did the Fuerte in the same orchard.

Q. (Shamel) Do you consider the color of the Puebla objectionable?

## THE FREY VARIETY

A. (Marsh) The old seedling tree is probably forty-five feet tall, and agency, however.

Carter Barrett: Thank you, Mr. Shamel, for bringing that out. I was quite interested in our recent field trip in San Diego county to get that reaction. The Puebla has not been behaving satisfactorily with most of the growers, after it reaches a certain age and many of them are turning the Puebla into other varieties—chiefly to the Fuerte.

Q. Concerning the Frey—does it grow upright or spreading?

A. (Marsh) The old seedling tree is probably forty-five feet tall, and has a spread of twenty-five feet or so; however, that isn't an indication of what an orchard of these trees would do. I haven't been able to observe any that are topworked on old seedlings. Their habit of growth is pretty high and not very spreading. Mr. Ruf, who has that old tree, says on small trees there is a larger spread than that of the old Frey.

**M. B. Rounds:** With regard to the Frey—I presume the reason we cannot definitely tell is because those trees are crowded together in Mr. Ruf's orchard.

Q. Carter Barrett: Mr. Rounds, I want to ask you a question which will bring out something. Mr. Griswold made a telephone report to the effect that the Frey was not particularly hardy, which conflicts with the opinion of Mr. Marsh. Will you please give us your opinion?

A. (Rounds) I don't know just where Marsh made his observations on the progeny of this tree. One orchard which we have been watching closely in Baldwin Park is on light soil. I don't know how well cared for these trees have been in the past—the man who owns the place is not there to look after them—I think Mr. Adams will bear this out—that the Frey scions where they were placed on other varieties were frozen clear down to the unions.

**Adams:** Yes, I was surprised at Marsh's statement concerning this particular variety.

**H. E. Marsh:** This was on Mr. Ruf's orchard, where I went over these trees. He pointed out his Guatemalans and the Guatemalans suffered tremendously more than his Preys had—some of them are only five or six years old—topworked on old large seedlings. It is his own personal opinion that the Frey will stand more frost than the Guatemalans which he has there. He had Nabals which certainly showed greater damage.

**M. B. Rounds:** Of course, he is pretty well protected and he did some firing with wood—his trees are closely crowded together.

**Marsh:** I am glad to get that slant on it, too. There is plenty of room between all of the trees where he has topworked them.

**Carter Barrett:** I think there is a point brought out that we should pay attention to. There may be quite a bit of variation in frost resistance due to soil conditions. We know positively that the physical condition of the tree has a bearing on how it stood the test during the past winter. Naturally, trees grown on light soils where they wouldn't have quite the opportunity that they would on better soils—might react more unfavorably—that is the thing we will watch carefully.

## **L. A. COUNTY—LEUCADIA, RYAN**

One of our committee chairmen this morning is evidently preparing for a hard winter because he telephoned that he probably wouldn't be able to get here during the morning because he is putting in eight wind machines; this is quite an event and companies are taking moving pictures of it. I don't believe he is in the audience—Mr. H. B. Griswold, not here. In that case, I am going to ask the most loyal Variety Committee man in Los Angeles county to give just a little account of the trip made this last Tuesday—Mr. Albert Adams of La Habra Heights. Will you just tell us a few words about your trip?

**Albert Adams:** Ladies and Gentlemen: About this particular trip last Tuesday, I don't know whether there is much to offer you but we covered a good deal of the eastern portion of Los Angeles county. Our experience on the whole is no different from that in San Diego or Orange counties. The varieties stood up about the same. Mexicans are most hardy and the hybrids next, with the Guatemalans the most tender. There is one thing most outstanding—and that is something which influences our opinion of the relative hardiness of the tree. The vigor of the individual tree has a great deal to do with it. A tree in weakened condition will not withstand the frost nearly as well as a tree of the same variety which was more thrifty and vigorous. I think that has thrown us off in a lot of cases because we haven't taken that into consideration, and it is very important. Another thing about frost affecting varieties—what happens one year is not a criterion by which we can judge what we are going to get another year. In other words, lightning doesn't strike twice in the same place. Frost may strike twice in the same place, and frequently does, but one grove may get very severe freeze or frosting one year whereas a neighboring grove may not be so hard hit—but the next year, absolutely the reverse may be the case. You can't judge by location just what is going to happen. There are a few varieties that I feel are outstanding. If I had had time to prepare this, I might have been able to comment. The Ryan we found in this particular neighborhood, as far as frost is concerned, has stood up particularly well—the Leucadia has stood up remarkably well. Although Mr. Griswold, who should be giving this talk, doesn't agree with me, Leucadia didn't stand up as well as Fuerte. I have some and have seen some in other locations which withstood the frost even a little better than the Fuerte.

## **THE HASS**

Then there is another variety in which there is a good deal of interest—the Hass. That is a small Guatemalan—most of you are familiar with it, although comparatively new. It is a summer fruit, hangs on a long time and while it is a Guatemalan and tender to frost, it seemed to come through remarkably well for a Guatemalan. Original tree is in La Habra Heights and was heated—orchard heated intermittently. On the coldest nights the heaters were not lighted but it came through moderately well.

**Carter Barrett:** I understood that the wood was not hurt in particular but the foliage was badly damaged.

**Adams:** You are correct. That is the situation. There seems to be no damage of any consequence on the wood of the original tree or that of the budded trees, although I happen to have one which had no protection and was growing pretty vigorously. Don't

get the impression that the Hass is frost-hardy. It is not, but for a Guatemalan it is comparatively hardy.

Q. Did the trees bloom at all?

A. The Hass has a peculiar characteristic—it never seems to have much bloom on it; the bloom isn't evident like it is on the Fuerte that comes out with a flush of bloom all at once. It apparently is never going to do any amount of blooming but it always ends up with a fine crop of fruit. I believe that the tree bloomed this spring. Mr. Griswold could give you complete details of that or perhaps Carter Barrett knows.

**Carter Barrett:** Yes, it bloomed but due to being hit hard, I don't think it is carrying anything. It has no fruit on it now.

Concerning Frey, which has been pretty well discussed, I might say in this orchard that we saw the off-spring of the Frey—not the original tree— every one of the trees in this orchard was killed to the ground as I recall.

**Rounds:** All killed down to the Mexican bud union.

## VENTURA OBSERVATIONS

**Carter Barrett:** Thank you. Now I am in a quandary but I don't think I need be, knowing the ability of the gentleman to respond. When we worked this out, we asked Mr. Albert Thille of Ventura to be here also. Up to this time I have had no word from Mr. Thille but I see Mr. Vincent Blanchard and I wonder if he could give us two or three words.

**Vincent Blanchard:** I am going to apologize, not for Mr. Thille, but for myself. Mr. Thille came into my office some time after he received your letter and stated that he was so busy with marketing associations with which he is associated as director and president, and doing a lot of building on his property, that he just couldn't do the job which you asked him to do. He asked me if I would handle it. When your program came out and it looked as though you had a full program, I did nothing about it.

So far as Ventura county is concerned, I don't know that we can add anything. We did not have quite as severe a freeze as you did in the other districts but some of us got hit pretty hard. Our county has variations in climate perhaps a little more extreme than was mentioned for San Diego county. We have the extreme coastal conditions from Ventura to Oxnard and interior conditions as at Ojai, Simi Valley—the Ojai valley was hit exceedingly hard with the freeze. I saw orchards there—avocado and citrus very badly frozen higher up than I had ever seen or heard of any trouble prior to this year, and the Mexican varieties—the ones which seem to stand it more because temperatures were exceedingly low there. The coastal area's main damage was in places where there was a lull in the wind which we had during that period and the damage occurred in a few instances. My own orchard was hit rather hard in comparison with some of the other orchards around. I have been fighting wind up that way, trying to find windbreaks for best protection, and perhaps had them a little closer than I should have. Consequently, damage was greater than neighbors who were not fighting wind. But, I would say that so far as varieties are concerned that presenting a picture from my orchard would be quite different than anything you mentioned. We had, according to the recording

thermometer, only three hours of freezing temperature—very low ceiling—did not freeze up any higher than this (indicating four feet)—Nabals, so far as foliage is concerned—tops good and fruits uninjured. That is quite different from anything you have mentioned. Generally speaking, in Ventura county with very few exceptions—our damage was not extensive. I can't think of any differences so far as our varietal response is concerned. I think about the same as those mentioned here today.

**Carter Barrett:** Thank you very much. I am sorry there was any misunderstanding about our program. We will have to go back to Albert Thille on that score. I felt pretty sure you could give us the picture, which you have very well done.

There are just a few things regarding the variety situation before we leave this subject and possibly you may have a few more questions. We need more help on the variety situation in L. A. county. There were only four, or possibly three out on the variety committee tour. We have many more interested persons—many more in the past. We may have had a particularly bad day. We need a larger group. In making field investigations, you don't want a large group. If you have too large a group, it is of no help, but if we could get more smaller groups out and get the same cooperation—reporting to me or to your county chairman on matters of interest regarding varieties in connection with those of commercial importance or the new ones that we are interested in, we will get along and make progress as we have in the past.

## **BETTER STRAINS AND VARIETIES NEEDED**

Now regarding what we are looking for. We are interested today in this question of so-called strains. When you begin to talk strains, bud mutation, etc.—lots of you don't look at it from the scientific standpoint, but we have certain Fuerte trees scattered throughout the country from Ventura to San Diego that seem to have exceptional promise and in some cases we have a considerable line of progeny which are following that promise as shown by the parent tree. Now if we can develop something of that sort either in one strain or several, in different localities, it may go a long way in solving our production problems in connection with the Fuerte variety. The California avocado industry is based on the Fuerte variety. There is no getting around that—75% of the plantings and production are of the Fuerte variety and it fills the best season for marketing and delivers better in most localities that are suited to avocado production. There are many localities, however, in which it doesn't produce well.

Now there is one other thing I want to stress at this time. Soon after the freeze occurred, a number of growers wrote to us and asked about top-working their Fuerte trees which were badly exposed to wind and badly frozen, to Mexican varieties. I wouldn't recommend that as a general proposition but of course there are some places where it might be a good plan if not carried too far. The fly in the ointment is that we have no satisfactory Mexican variety to recommend to a grower for commercial production. The only one on our present recommended list is the Duke and it is only good in interior areas. The one place where we can find new varieties under the present situation so far as I can determine is going to be in backyards. It may be in San Diego or in the metropolitan area of Los Angeles, or in Santa Ana, or in some grower's yard. Most orchards have largely topworked their Mexicans as well as many of the other



Guatemalan varieties and they haven't them in the orchards and are not experimenting to any great extent. So it is much harder to locate what we need in backyards. Now if you people here and the people you can interest will cooperate with us to the extent of calling to our attention seedlings which look interesting to you, we will appreciate it very much.

### **FUERTE BLOOMING AND BEARING**

Q. Did I understand you right—that you have found Fuerte trees that are bearing consistently which you recommend for propagation?

**Carter Barrett:** We have certain trees and have watched certain of their progeny to the extent that we feel those trees are better than average Fuerte trees but we haven't sufficient evidence over a long enough period of time. However, many nurserymen and many of us are so convinced at the present time that we are using them in larger proportion.

Q. The reason I am asking that is because I happened to buy 575 trees and they are leaning the other way. They seem to refuse to bear. They are now seven years of age and there wasn't anything known at that time in regard to this particular thing; at least it was just the beginning.

Q. Are they trees that have excessive bloom or light bloom?

**Carter Barrett:** That is an interesting point discussed somewhat at the last Institute. I couldn't say what the bloom habit is in regard to the Cole strain but we are of the opinion that trees that over-bloom are not likely to carry such large crops. Trees that bloom, normally, and hold a large proportion of foliage during blooming period are much more likely to carry fruit to maturity.