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Report of the Variety Committee—1940

Adopted at Annual Meeting—May 11, 1940

IN RETROSPECT

On this, the twenty-fifth anniversary of the founding of this Association, it seems fitting that we should pause for a moment and survey the work of its most important technical committee through a quarter of a century, and pay tribute to those whose efforts have helped this industry to avoid many a pitfall and to reach a firmer and somewhat more stable position today. The job is far from completed, but the untiring, self-sacrificing and enthusiastic work of many individuals who have labored at it through these years has made possible a sound understanding of the goal to be achieved. It has also accumulated a knowledge of those characteristics essential to a successful variety, which now permits us to discard many seedling candidates at an early stage of investigation and thus forestall much of the economic loss of the earlier years of the industry.

The present chairman of the committee, having been associated with the industry throughout the whole life of this Association and having gained his first urge to service of this sort through acting as errand boy for the earliest Variety Committee, feels that it is not amiss to take a few moments to pay our respects to those who carried on this vital work under much more trying circumstances than we do today.

Turning back the pages of history to our first Yearbook of 1915, we find P. O. Popenoe giving a full account of the then-known varieties, with descriptions. In opening his remarks Mr. Popenoe said "I believe it can safely be said that the most important problem which we avocado growers of California are facing at the present time is the question of varieties." To a considerable degree that is still true.

Our good friend, Dr. Webber, was the first chairman of an organized committee to study varieties and at the second semi-annual meeting in 1916 he brought in a report which has remained as a sound foundation for all future work of the committee. I do not wish to tire you, taut feel that it is only proper that the names of those who did such yeoman service in the trying early years should be recalled. They include Doctor Ira Condit. Wm. Hertrich, Chas. D. Adams, T. U. Barber, Knowles Ryerson and Dr. Coit. Dr. Coit served as chairman of this committee for ten years.

During all these years, the volunteer members of this committee courageously prepared recommendations based on the best information available—for which they were often assailed personally with great bitterness. They spent endless hours in the field and in conference. They managed exhibits and performed many other services to smooth the path of the planter and generally received small thanks for so doing. Their sacrifices and efforts should be gratefully remembered.

CONTRIBUTIONS OF PLANT EXPLORERS

When avocado growers think of plant explorers, the first name is that of Wilson Popenoe, whose contributions to our knowledge of the possibilities offered by the countries which constitute the home of the avocado have been even greater than the value of the varieties actually introduced by him. Though none of his introductions may have permanent commercial value, they form the basis for endless combinations which have, and will be invaluable to the work of the breeder of new varieties.

The same may be said of those other pioneers who sought to introduce varieties of value from Mexico and Guatemala. In their number are listed Juan Murrieta, W. D. Stephens, E. E. Knight, Dan Glower, Edwin G. Hart, the West Indian Gardens and A. D. Shamel.

In most cases the value has not been in the commercial significance of any individual variety, but in the fact that through their efforts we have a wider selection of the two important races of avocados (for California) than exist side by side in any other place in the world. That this is truly important is demonstrated by the large number of valuable new seedlings developed in the past few years, which bear the unmistakable mark of being hybrids. A cross between the thin and thick skin races bids fair to best meet California's commercial needs.

Tribute should be paid to both the University of California and U.S.D.A. for strong support and cooperation in these efforts.

PRESENT ORGANIZATION

The earlier committees usually consisted of from three to seven members and carried on investigation as a unit. Of late years, it has become apparent that the size and widespread character of the industry demanded more workers and more general local participation if the job were to be done efficiently by volunteers. Today we have the present method of much of the local field work being done by county committees with this committee acting as motivator, coordinator and disseminator for the required information and conclusions. More than fifty persons do a certain amount of active work in attacking these problems now. Further changes in method will be necessary from time to time.

PROJECTS

Complete File of Segregated Variety Information. It was reported last year that one of the most necessary tools for the work of this committee had been forged. A complete file of all variety information has been established by Mr. M. B. Rounds and much has been done during the past year to bring it up to date. Contributions come in from many sources. This past year Mr. Rounds' activities have been broadened by his transfer to the Citrus Experiment Station and this has enabled his growing enthusiasm and understanding of variety problems to be put to work more efficiently for the industry. This file is the property of the California Avocado Association.

Variety Test Plots. Those plots, for testing promising new varieties, are a cooperative

project of the Division of Subtropical Horticulture at U.C.L.A. and this committee. Established a year ago this spring at strategic climatic points from Santa Barbara to San Diego, they are already beginning to demonstrate their value. Under the system by which this project is operated, it has been possible to try out all varieties of positive interest, including the patented varieties, under the same relative conditions, in many varying climatic areas.

Unfortunately this project has been affected this season by one of the difficulties of a volunteer project which will be discussed in another section of this report dealing with the future. Most of the responsibility for any necessary replacements and extensions of this project has rested upon the shoulders of the chairman of the committee, who has been unable this spring to give the time and meet the costs of making them. Consequently, we still have a number of the plots which are not complete and have not yet established two others which we believe are very desirable.

We do have, however, all varieties growing in some of the plots and under similar climatic conditions. The results thus far are very interesting and seem to make it possible to get an answer in regard to the merits of these varieties much sooner than has been the case in the past with undirected and uncorrelated methods.

Field Work and Other Activities. A general meeting of the committee was held last fall in which objectives, policies and variety behavior were discussed. The county committees have made field investigations and held discussions. The excellent summarizing of the situation in San Diego County at the last Avocado Department meeting is an example to other counties.

Mr. Rounds and the chairman have spent a number of days in the field, scattered over all counties. Some of these trips have been made together, others alone or with other interested parties. A number of variety discussions have been held locally. We believe that close contact has been maintained with all sections of the field so that information herein presented is a true representation of the variety situation.

Private Study of Tree Production Problems. As indicated in last year's report, a private investigation on a commercial scale of the factors involved in the growing of healthy, high producing avocado stock has been undertaken. A progress report from this project, now in its third year is hereby given. The basic element in this study is complete identification of the origin of the delivered tree.

The first problem attacked was the relative desirability of various seedlings or budded thinskin varieties as stock sources. Several dozen sources have been tried and accurate records kept. The score still seems to show that Ganter or Ganter seedling seeds made the most uniformly germinating, most rapidly calipering and generally satisfactory trees for stock. There are many more to be tried. These results are further borne out by the seedbed trials conducted by Mr. Rounds at the Citrus Experiment Station. He has one other source that seems to top even the Ganter this year.

The second problem relates to the transmission through seed, of "Sun-blotch," generally accepted to be a virus disease. The records at the end of the second season show that, in all probability, a certain proportion of the seedlings of a sunblotched tree show active symptoms of the disease in the nursery. That the difficulties of eliminating this source of

infection are great, will be shown by details on which the statement is made.

The parent tree of these seedlings is one of the most vigorous and beautiful yard specimens existing and is of great size. Originally it was a budded Guatemalan which froze down in one of the early freezes and came up from the root. A fairly careful inspection by competent examiners failed to show any difficulty of this sort when the seed was purchased. This one stock comprised about five hundred trees out of a total block of three thousand. As the trees germinated, a considerable number of them showed peculiar growth characteristics, but these signs could not in any way be associated with known symptoms of sunblotch. The worst of these peculiar individuals were all eliminated at the time of transfer to the field.

Trees of this stock were budded to three different varieties. The parent trees from which the buds were taken were all examined more than once by experts and declared clean. Yet variety number 1 showed five trees definitely sunblotched; variety number 2 one tree affected; and variety number 3 showed eight trees.

Trees on no other stock showed any sunblotch symptoms. The apparent conclusion to be drawn is that sunblotch is carried through the seed in low ratio. If the source of seed is not known, the law of averages may work for or against the planter. Chance might make a given lot almost free, if not entirely so or it might make the amount of infection very heavy.

Trees of this stock, which have passed close inspection and seemed perfectly normal, have gone out for planting with other stock and in the course of time should determine a much argued question as to whether this disease may lie latent in the tree and appear later. As all these trees are definitely identified, it offers opportunity for study not heretofore available.

A third problem on which observations have been made is the influence of the stock on the bud and vice versa. Weakness or susceptibility of some stock over others for some of our common troubles is indicated by this example.

Twenty-six trees in the center of a row of 135 were of a different root stock. The whole row was budded from the same Fuerte tree. These twenty-six trees stood out from the rest of the trees in the row and the other rows next to it in a most striking manner. Eighteen were in advanced stages of chlorosis and nearly all the rest were affected sufficiently to be noticeable. The change of color beyond the end stakes of this lot was most striking.

Observations to date seem to indicate that both certain seed sources and certain individual trees of many sources show a greater-than-average susceptibility to disease; in this particular case, to chlorosis.

As is well known, the Leucadia is one of our most vigorous and rapid growing varieties. In balling trees, it was found that the root system under the Leucadia trees budded on the, same stock source as two other vigorous varieties was much greater than in the case of the other two varieties and that the roots were more evenly distributed throughout the ball.

Variety and Individual Susceptibility to Insect Pests. The information here given was gathered and presented to the committee by Dean Palmer, whose careful observations

have so often served the industry.

In areas where Dothiorella rot is prevalent, the thinskin and hybrid types with light leathery skins, are much more affected than the thick skin fruits

Certain varieties show more resistance to tip-burn than do others.

Some varieties and individual trees are more susceptible to red scale infestations than are others. One Fuerte tree observed was literally covered with red scale while trees which interlocked branches with it were practically clean. Thinskins have less resistance to greenhouse thrips than the thickskin types. Varieties with particular susceptibility to thrips are the Gottfried, the Itzamna and the Northrop.

Itzamna shows extreme susceptibility in coastal areas to ring neck and other infections.

Suggested Conclusions To Be Drawn from These Two Sets of Observations. That much more careful study should be made of the inter-relation of stocks and tops.

That greater care should be exercised in the production of stock to eliminate disease, particularly sunblotch.

That weak individual trees or those varieties showing some particular susceptibility to any of several known avocado difficulties should be eliminated as the possible source of further plantings.

That the matter of resistance by known varieties and individuals to insect pests be given ample consideration in determining the merits of those varieties for planting, particularly in certain localities.

That information of this type be freely pooled for the common good of the industry.

That the planting public be urged, for its own protection, to demand constantly higher standards in the production of nursery stock. In so doing it will not only protect its individual interests, but probably slow up the production of stock and the planting thereof, so that the expansion of the industry may not only be on the basis of sound, producing stock, but more in pace with the ability of the industry to develop its great potential market.

The Sunblotch Situation. Intermittent reference to this disease has been made throughout this report. Progress in its study is slowly being made to supplement the admirable report originally made by Professor Home and Dr. Parker.

Nearly all those engaged in the study of this problem have arrived at a point where they are willing to urge a campaign among growers for the elimination of all such known cases as being economically unprofitable and a potential source of danger to other avocados.

Tree Records. The need for simple tree records regarding physical behavior and fruit production should again be emphasized. The problems of "boarder" trees, over-planted orchards and the study of disease and insect pest reactions cannot be intelligently handled without such records. They are of tremendous advantage both to the grove owner and the research man, and should be available in all cases.

A Look Toward the Future. In the opening portion of this report, we took a look at the

past, as is natural at the turn of a quarter of a century; but the industry is very young and it is even more fitting that we view the possibilities for the years ahead.

For the avocado industry certain things seem to be indicated.

First, we have completed a certain portion of our trial period and with the proviso that various problems of production and marketing can be solved, we are likely to be entering a period of expansion involving large scale commercial plantings.

That much of the present planting is not to figure in the permanent commercial production of the industry.

That California avocado growers have always been a forward-looking and resourceful group and that the problems standing in the way of sound expansion will be solved.

For this committee, the future seems to hold a very real need for some time to come.

During the past year, two articles bearing on the problems of the committee have attracted attention and provoked considerable thought.

One of these is "Looking Forward" by Wilson Popenoe appearing in the 1939 Yearbook of the CALIFORNIA AVOCADO ASSOCIATION. The other is "More Regularity of Production Necessary in Avocado Industry" by Vincent Blanchard appearing in the March, 1940 CALAVO NEWS.

Wilson Popenoe states that he feels that much of value may yet be obtained from the native habitat of the avocado in Mexico and Guatemala, not only in the way of varieties, with immediately useful places in our marketing picture but even more so in the matter of stocks and bases for breeding work. His remarks concerning the value of periodic study of the trees in the Atlixco Valley (the home of the Fuerte) are fully concurred in I by the chairman of this committee. It is here, mainly, if not entirely, that thin and thick skins are intermingled in such proportions as to give an excellent chance of finding hybrids such as the Fuerte, which seem to offer the best type of avocado for California conditions.

Though Dr. Fairchild calls Wilson Popenoe's avocado explorations in Central and South America one of the outstanding examples of such work, Wilson would be the first to admit, we think, that he was only able to open the way and that there are tremendous fields and phases of such work to be covered profitably.

At the present time, the general feeling seems to be that such work should wait for more ample means than seem to be available. The observed difficulties arising from seasonal differences, cultural methods at variance with our own or the entire lack of them, and the lack of overlapping between the two races of avocados would seem to show that better results can be had in California with small expenditure. Thanks to the early introductions—we have a better chance to obtain what we want right here than in any other place in the world, either from chance seedlings or systematic breeding. The two races are intermingled in greater profusion in California than in any other place and they are already acclimatized.

Should another attempt be made to study and introduce new forms from the native habitats of the avocado, the research worker of the governmental agency which performs this task, should be accompanied by a representative of the industry, who has

a large practical background of industry knowledge and a commercial viewpoint as to the merits of a given fruit and tree. In the days of the early introductions this knowledge was not available in any degree. Today, after slow and painful experience many points as to the commercial value of a variety have been fairly well established. The viewpoint of the trained, technical horticultural research worker as to the value commercially of a given variety will often be found to be widely at variance with that of the man who has to produce the fruit for a living and has demonstrated that he can do so profitably. In sending such a representative, the industry should also consider the merits of having him trace out the question of whether sunblotch exists in the native habitat of the avocado.

This committee of lay workers has a very important place to fill for a long period ahead as it can definitely represent the growers, their needs and desires, in dealing with the proper agencies for carrying out such a program as has been outlined. It can enlist and direct the activities of the large number of lay workers which are essential to the success of professional workers in covering such a large field and it can act both as a spur in carrying out such work and as an agency for the release of information previously acquired and correlated.

But the experience of the last few years show very plainly that a volunteer committee of this sort has neither the time nor the means to prosecute the intensive studies and projects required for efficient and early results.

We believe that the Board of Directors of this Association recently took a long step in the right direction, when they again set up a special fund for research work. There is little in it at present and its growth will depend upon the generosity of those who see the vital needs existing in the industry; but it demonstrates an essential principle, that if the industry is to receive help, it should help itself. If we can go to the University with an offer to share in the expense of such a program, we are far more liable to be listened to favorably. The crying need is for groups such as ours to bend our own energies toward the solution of their problems rather than dumping them entirely in the hands of government and then sitting back supinely with folded hands and kicking because they do not get what they want and need.

Status of Varieties—May, 1940. Only as we have gradually worked up to a climax can there be any substantially great change in the status of varieties. Such a point was reached last year, when by practically universal agreement, the committee stated that the older varieties which have constituted commercial plantings of the past and present are probably definitely out of the running so far as future plantings are concerned.

This statement, of course, excepted the Fuerte, but included Puebla, Nabal, Queen, Benik and Dickinson. As the reasons for this position were given in full in the 1939 report, they will not be repeated here.

The Anaheim occupies a peculiar position by itself. For certain conditions, we have not as yet developed a satisfactory substitute. The Anaheim has the best record for consistently heavy production and in spite of low prices pays on the basis of volume. The past year has seen some Anaheims worked over and scions from the same trees being used to topwork other growers' trees to Anaheim. The variety is very tender to frost and the fruit is of poor quality, but until it can be replaced with a better variety with

heavy production it seems to be able to hold its own.

Thinskin Types. We have real need for better thinskins and any information concerning such varieties will be welcomed.

The Topa Topa, Mexicola and Ganter are in demand as seed sources, but no one of them makes a satisfactory fruit to market.

DUKE—The Duke has again demonstrated that it is a satisfactory fruit for the severe interior valleys. Both in the San Fernando Valley and at Etiwanda, it produced good fruit and brought satisfactory prices. The trees stand wind, cold and heat better than even the average thinskin type.

FUERTE

The season just closing has been the off-year for the Fuerte variety, but we have seen isolated instances of good crops and certain trees have not dropped sufficiently to spoil their record for consistency.

The study of so-called "strains" is being carried on largely by the Division of Subtropical Horticulture of U.C.L.A. In time they will be able to determine the value of such propagation as there are farflung plots in many sections.

During the past season, attention was focused on the Newman strain as being outstanding in bearing ability under the most difficult Fuerte conditions known. Strong warning to the growers should be made in this case as in all others not to go too far with their own propagation or planting of such a strain until it has also demonstrated an ability to repeat under their own local conditions.

Varieties **Still in the** Experimental Stage. Growers will still continue to have to grow varieties with promise in reasonable numbers in order that the ultimate test of consumer acceptance may be reached. As in all pioneering, this is costly and a gamble—but the only way in which the goal may be reached.

With the exception of entirely new varieties, no descriptions will be given as they are available in past Yearbooks.

HASS—Seems to have thoroughly demonstrated its worth in the La Habra-Whittier area, both in vigorous growth, early and heavy fruiting. Market reports were satisfactory on a limited production during the past season. The coming season, with a good crop, should further test this phase of the situation. Reports from the coastal section of San Diego County are also distinctly favorable. The 1939-40 crop, probably due to extreme weather conditions in the growing season has shown a greatly increased roughness of the skin. This is probably seasonal, and has not apparently affected the eating quality. This should be taken into consideration when planning future plantings.

EDRANOL—Has greatly increased its favorable standing in the northern coastal belt of Ventura and Santa Barbara Counties where it is a smooth, well formed and well sized fruit. Too many slender and crooked necks and too much woodiness of the skin have spoiled its standing in the Whittier and La Habra area, where its usefulness is confined to home plantings. The San Diego coastal area presents conflicting reports as to acceptability of this variety. A good report from Vista.

RYAN—Has risen in favor since the last season. Has been granted "Calavo" rating by that organization and was marketed with reasonable success. A most attractive fruit in appearance and in size, frost resistant -and rather consistent in bearing habits. Good sized plantings should soon determine the consumer acceptance of this fruit, which is variable in eating quality. In many districts the fruit has to be picked early to avoid difficulty, but Dr. Coit reports that they hang late in good condition at Goleta. Does reasonably well at La Mesa and coastal district of San Diego County and very well at Vista.

HENRY'S SELECT—A promising thin skin type which has stood well on the market during the past season. Of excellent quality; it bears at the period when there is little first class fruit. Very hardy and matures its fruit between frost periods. Well suited to many of the flat country areas with good deep soil, cheap water and frosty conditions, where it can be produced at costs with which warm hillsides cannot compete.

HELLEN—A medium sized, late summer and fall fruit of green color and good quality. The season is somewhat later than originally given in charts—being late August to November. Has been a consistent producer of readily marketed fruit for seven years in the Santa Monica area. No information of its reaction to conditions in other areas will be available for another year or two. Reasonable amounts of nursery stock have been distributed and trees topworked in widespread areas, Some trial of the fruit made last year, when still immature gave some unfavorable reactions and the main crop was damaged by the intense heat of last September; yet in proper season a number of excellent specimens were tested, which bore out earlier favorable impressions. One year old buds are blooming heavily and the trees are outstandingly vigorous.

MacARTHUR—Still giving good results in the north coastal country but not of sufficient quality to indicate any great extension of present plantings.

MACPHERSON—Has been patented and a limited amount of stock will be available for trial. Untried other than the parent tree, except in the cooperative plots for the committee and the University. In these plots wherever the variety was successfully established, as it has been under a wide variety of climatic conditions, it has shown outstanding vigor of growth. The parent tree is in very poor condition and has been heavily cut for bud-wood, so its record may be impaired during the coming season.

NOWELS—The outstanding find of the past season has been registered as the Nowels and originates in Huntington Park. Was brought to light through the efforts of those loyal and indefatigable searchers in that area, Mr. Ebey and Mr. Hirschvogel. This fruit is almost identical in appearance with the Fuerte, more frost resistant, and has an earlier season. The tree is apparently vigorous—is now seven years old and has borne three increasing crops. This rather indicates precocity. The parent tree is about eighteen feet high and the same width. This fruit went through the laboratory and was subjected to the judgment of the tasting committee and the tests of the chairman with the most promising results of any seedling submitted in some time. For the present it will be propagated only in the cooperative plots of the University project.

There are a number of varieties, which are interesting, which do not appear in this report. The committee will be glad to supply further information in regard to them; but they are not sufficiently outstanding at present to warrant inclusion here. The attempt is

being earnestly made to focus attention on those with the most promise, in order to narrow public consideration to fewer varieties.

The chairman wishes to express his own thanks and those of the committee for the loyal, earnest and widespread assistance given this work during the past season. With such interest and help we are assured of progress.

Respectfully submitted,

CARTER BARRETT, Chairman Variety Committee

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