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Report of the Variety Committee on Avocados California Avocado Society—1945

Foreword

With the war in Europe nearing a victorious conclusion and the war with Japan reaching a favorable stage, the thoughts of the country are beginning to be focussed on reconstruction. The many problems of such a period are beginning to be apparent as well as the increased opportunities for progress in all phases of life. Into this complicated pattern, the California avocado industry must be fitted. With this situation in mind, the committee has definitely turned its eyes to the future in making recommendations regarding varieties, and such other technical matters as seem to be within its sphere.

The committee has been enlarged this year to twelve members, fully representing all producing areas and introducing new blood which will be invaluable in the future vigorous prosecution of the work of the committee. At the annual meeting of the committee held in March at the Citrus Experiment Station, there was a full attendance. All decisions were arrived at, after a full discussion, by unanimous vote.

The committee and the industry are again greatly indebted to Marvin Rounds for carrying on the active contacts and research in its work, which detailed material he has carefully filed in his office, where it is readily available to all interested in this phase of the industry. He has been enabled to do this to an extent denied to others in this work, through the traveling made possible by his University duties.

Policy and Objectives

The Committee recognizes the Fuerte variety as the basis of the California industry, comprising over seventy-five percent of all plantings and production. It realizes, however, that in many areas and under certain conditions, the Fuerte variety does not produce satisfactorily. Under any circumstances the extreme limit of its maturity period is six months. The Committee, therefore, is concerned with two primary problems—the search for supplementary varieties to aid producers in growing areas which have been proven unsuited to Fuerte production and the search for varieties to properly cover the summer and fall six months period when the Fuerte is not available to consumers.

The eventual goal for the commercial producer is from two to four varieties which will satisfactorily cover the year. One of the great marketing difficulties still confronting the industry is the great number of varieties and seedlings which each year have to be disposed of with profit to the producer. Only economic necessity and a better selection of varieties available to the producer will alleviate this situation.

Even after thirty years of study and experience, we still do not have the evidence to surely and drastically resolve the list of recommended varieties to this extent. At this

point, it is obviously unwise to attempt to arbitrarily reduce the use of varieties in the industry to a static basis. We simply do not have varieties, as yet developed, which adequately meet the requirements of the industry in all its phases.

In the new chart of recommended varieties for 1945, which is an integral part of this report, we have reduced the number of varieties recommended for commercial planting and topworking to five, no one of which is suitable to all growing areas. Three are restricted to one or two districts while one is recommended as an established commercial variety in one district, but as an experimental variety in all other districts.

For some years, it has been the policy of the Committee to place certain varieties on the experimental list for a time in order to encourage sufficient planting and to provide some volume of the fruit for trial marketing and then, if it did not continue to show promise, to remove it from the list to discourage further expansion. This season's chart shows three varieties withdrawn from the experimental list and three new ones substituted for them. No planter should plunge on the varieties in this list unless he has reasonable evidence to suppose that they will fill a needed place in his local situation successfully.

Detailed Explanation of Selections

Selection of the Fuerte variety for the commercial list needs no explanation after the years of discussion, which have preceded this report.

Though they have a place as yet in certain other areas, the main reason for the appearance of the Anaheim and Nabal in this list is their supremacy in production in the San Diego County coastal area. The Fuerte is very unsatisfactory, both in production and quality in that area whereas these two varieties form the backbone of production.

The Hass with high production in area 3a is definitely commercial in rating for that area, but by general agreement in the Committee, it was felt to be sounder, on the basis of evidence to date, to place it in the experimental list for the other areas. It would seem at the present time, looking towards the future, that the Hass variety is definitely the runner-up to the Fuerte. There is considerable argument over its appearance, but no denial of high quality, long maturity period and good shipping qualities. Its record for consistent, heavy production is excellent.

In the Ventura and Santa Barbara areas, the MacArthur seems to be very satisfactory as a producer and of reasonably good quality and is recommended for those areas, only.

With the future in mind, the Ryan has been unanimously recommended by the Committee for removal from the list on the grounds of inconsistent bearing and very variable quality.

Three varieties have been removed from the experimental list—the Edranol, the Irving and the MacPherson. There is general agreement that the Edranol has not been reliable enough in bearing during the last years to warrant a place on the commercial list and that there are sufficient plantings extant to demonstrate its relative worth in the future. Therefore it has been removed from the experimental list also.

The Irving has not withstood the concentrated study of the past year and has therefore

been removed.

The MacPherson has been removed because none of the propagated trees have borne to any extent as yet.

Three new varieties have been added to this trial list—The Bonita, the Frey and the Stephens' Choice.

The Bonita is a rather large green fruit originated by Dr. Pierce at Santa Barbara and bearing well in contiguous areas of similar climatic conditions during the summer season.

The Frey originated at Baldwin Park and has done very well in production in a number of places. It is a green fruit for the summer season and the trees seem reasonably frost resistant.

The Stephens' Choice is a green summer fruit which has been planted for many years in a very restricted way. It has good qualities and was recommended for listing by Dr. Coit who feels that it has never had a sufficient chance to make good, because no nurseryman has had any particular interest in it.

Reasons for having the Hellen, the Encanada and the Hazzard on the experimental list will be found in previous reports.

PART II Recommendations on Other Industry Technical Problems

As we approach the period of considerable expansion of plantings which seems likely to take place after the war, there are certain problems which vitally affect the success of these plantings and the welfare of both nurseryman and planter. It seems to be within the province of this Committee to make certain comments and recommendations to the producing industry.

The importance of bud selection has become very well recognized of late years. It is very evident that growers must pay more attention to keeping production records of individual trees in order to establish a sound basis for such selection and to enable them to eliminate boarder trees. From such records in the past plus experimental propagation in difficult areas, have come certain well known, so called "strains" of the Fuerte variety, such as the Newman, the Cole, the Burgess, etc. Probably the Newman strain has given more universal satisfaction under test than any of the others, but there are other less publicized sources of good bearing strains which are probably equally satisfactory and particularly in the areas of their origin.

For the safety of the planter and the eventual progress of the industry along these lines, the nurseryman should be able to identify each tree produced as to its actual parentage, both bud and root. As will be shown later in this report, information which can be thus acquired is particularly essential in the study of such problems as the transmission of the virus disease known as Sunblotch.

The planting public should be advised that it is practically impossible for a nurseryman to produce more than a few hundred trees from budwood of any given tree. As trees grow older and get into increasingly heavy fruit production, it becomes more and more

difficult to cut any quantity of buds from them. Buds suitable for propagation purposes are simply not formed in any quantity. By the time a given tree's reputation is thoroughly established for consistent, heavy bearing, it is seldom producing much growth suitable for propagation purposes. The nurseryman is therefore forced to resort to young, vigorous first generation progeny of this parent for the source of any considerable amount of propagating material. If due care is taken, this seems to be a legitimate and necessary practice and under certain circumstances should possibly result in even better trees. However, these source trees should also be identified and comprehensive records of their behavior kept.

Rootstocks

As compared with bud selection, very little attention has been given the problem of rootstocks. That it is very much more serious than generally suspected will be brought out in this phase of the report. The Division of Subtropical Horticulture of the University has been and is conducting experiments along this line with some preliminary information available. Private individuals have also done some work of this nature and the recommendations contained herein are largely the result of their experience and that of practical nursery men.

The use of seed gathered indiscriminately from any and every source should be discouraged. Because of the complicated genetic background of seed from a single source, there is bound to be considerable variation in the resultant seedlings. If seeds come from many sources, the problems of germination, sizing and effects on the bud will be greatly accentuated. This results in greater production expense for the nurseryman and an orchard uneven in size and production for the grove owner.

Transmission of "Sunblotch" Through Seed

There is grave danger of "Sunblotch" infection being carried through seed from unidentified sources. Two parallel cases will be cited to sustain this conviction on the part of the Chairman of the Committee.

The first case occurred in a nursery five years ago. Source records were kept and segregation of seed in the beds was practiced. Out of thirty-six sources on which records were kept, one lot of seedlings showed "Sunblotch". This occurred in about fifteen percent of the trees when they were ready for balling. This group of seedlings was budded with buds from three varieties, all from definitely identified sources. These same bud sources were used on other stock in the nursery. Only on the #11 stock did the disease appear. On checking the parent tree of these seedlings, which is a beautiful and very large specimen tree, we found that there were no visual evidences of the disease but that its history showed that it was a budded tree which froze down in 1922, and as is apparently often the case, the new tree from the Mexican type root came up clean to the eye, but able to transmit the disease.

The second case of this sort was checked upon during the last year. An East Whittier grower planted a grove with approximately four hundred nursery trees and four hundred seedlings, which were to be budded in place. The seedlings were all from one parent

tree which grew near the home of the owner. Seed had been taken from this tree in other years and it had been examined by a number of competent observers for "Sunblotch" without being suspected. The seedlings were budded at one year of age to four main varieties—Fuerte, Ryan, Encanada and Hellen. The buds were all taken from individually identified trees. The same buds have been repeatedly used on other stocks both in nursery production and in topworking without any trouble appearing over a period of years. When the buds on these seedlings were mostly one year of age, some re-budding of missed trees was needed and on inspecting a number of specimens of the buds in working the rows, unmistakable signs of "Sunblotch" were discovered. A careful check which took over a day and a half disclosed that one hundred and fifty-two trees out of three hundred and forty-one showed conclusive evidence of "Sunblotch" with a number of others apparently border line cases. Therefore at one year of age over half of these buds on this root showed the disease. The buds from the same parents on other nursery stock in the planting failed to show symptoms of the disease. On close questioning, the owner remembered that the seed source tree had been a Sharpless or Fuerte originally and had frozen to the ground in 1922, coming up as a vigorous, apparently healthy seedling, bearing heavy, consistent crops of a black fruit which seemed very satisfactory for seed purposes. Yet the facts indicate that the disease is systemic and such an apparently clean tree is fully capable of transmitting the disease in a heavy percentage of cases.

These two cases would seem to establish that for all practical purposes, the disease of "Sunblotch" is transmissible through seed and that it is imperative that the greatest care be exercised in the selection of seed sources. It is not only necessary that the appearance of the source tree be checked by competent specialists in the identification of the disease, but that the history of the tree be thoroughly checked and established.

It still seems probable that no seedling which has not been budded or grafted and whose parentage was clean should be a source of transmissal. Budded trees as a seed source need much more careful checking than seedlings but without a case history most persons cannot tell certainly whether a tree is a seedling which has never been subjected to vegetative propagation.

Qualities Needed in Good Stock

The nurseryman will want high germination ratio in his seed, ability to. grow rapidly and caliper quickly for early budding, a sturdy, healthy foundation which will show good affinity for the majority of the tops which he is to bud upon it. However, while the nurseryman desires trees which make size quickly, that may not be the most desirable attribute of trees for planting on certain deep, rich soils where tremendous size soon creates expensive harvesting problems. For such soils a slower growing stock which will produce a more spreading tree and one that may come into bearing earlier may be superior from the grove operator's viewpoint. There are indications that such a stock may be found, as tentative experiments with a stock known as #28 show that it was slower in growth and calipering and that buds from a high bearing Fuerte source began bearing on this stock at one year in contrast to trees from the same bud sources on other more rapidly growing stocks, which began to bear at two and three years of age.

Such lines of investigation may possibly bear fruit in the future which will be of great help in solving a number of industry problems.

Named Seed Sources As a Step in the Right Direction

Generally speaking, the only identifiable sources of good stock which the experience of nurserymen has shown to be superior are certain named varieties of the Mexican or thin skinned type. These are the Ganter, the Christie, the Gardner Seedling, Topa-Topa, Mexicola and Carton. All trees of these varieties which are selected as seed sources should be subjected to the most searching investigation as regards infection from "Sunblotch".

It would seem desirable that some individuals should be encouraged to embark on the project of growing these varieties for seed purposes only, and it might well prove more profitable than fruit production for food. It has been further recommended that these plantings be isolated from other avocados in order to produce selfed pollination. The buds of each variety should be grown on seedlings of their own kind.

Conclusion

The general level of quality in the trees produced for avocado planters will depend largely on the informed opinion of prospective planters and the extent to which they are willing to pay a premium for quality. An avocado grove is or should be considered a lifetime proposition, and in that light a small difference in the price per tree should be considered immaterial against the immense liability of poor production and health over a long period of years.

It would probably be highly beneficial to the industry if planters would organize their plans far in advance and have their trees grown to agreed upon specifications by reputable nurserymen of proven integrity.

The Committee desires to thank all of those persons who have contributed to the information out of which these reports are built and to those who have through the Press and other media made the information available to the growers.

The Chairman, in preparing and rendering this report for the tenth time particularly appreciates the whole-hearted cooperation of the members of the Committee through the years and the fidelity with which they have served through often trying conditions. There is also a deep appreciation of the manner in which the field has accepted from year to year, the attempt to make these reports stand for fairness and integrity, as well as sound factual interpretation. We all hope that the solutions of many of these difficult problems of the industry may be found in future activities of the Committee.

Committee:

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M. B. Rounds	H. B. Griswold
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Table 1—Varieties Recommended For Commercial Planting or Top-Working

Variety	Market-ability	Oil Content	Color	Shape	Weight	Skin	Seed	Race	Area Adaptation
Anaheim	Fair	Low	Grass Green	Ovoid	12-28 ozs.	Med. Thick	Medium	Guat.	2-3b
Fuerte	Excel.	High	Dull Green	Pyriform	7-16 ozs.	Leathery	Medium	Hybrid	1-3a-3b-4-5-6-7
Hass	Good	High	Black	Ovoid	7- 9 ozs.	Leathery	Small	Guat.	3
MacArthur	Fair	Medium	Green	Pyriform	14 ozs.	Med. Leathery	Med. Large	Guat.	5
Nabal	Good	High	Green	Round	16-32 ozs.	Smooth Thick	Medium	Guat.	2

For Experimental Planting

Bonita		High	Dark Green	Pyriform	13 ozs.	Med. Thick	Small	Guat.	5-2-3b
Encanada		Medium	Green	Pyriform	7-10 ozs.	Leathery	Small	Guat.	3a
Frey		Medium	Green	Pyriform	15-18 ozs.	Leathery	Small	Guat.	1-3a-4-6
Hazzard	Fair	High	Green	Pyriform	12-16 ozs.	Medium	Medium	Guat.	1-5-6
Hellen		High	Green	Ovoid to Pyriform	12-18 ozs.	Leathery	Medium	Guat.	1-3b-5-6
Stephens Choice	Good	Medium	Green	Pyriform	16-20 ozs.	Smooth Thick	Medium	Guat.	1-3a-2-5-6

NOTES

1. All varieties are listed alphabetically. Their position in any list does not indicate their relative value.
2. In the chart giving season according to area, only those varieties marked with an asterisk (*) are recommended for commercial planting in a given area.
3. The area adaptation numbers on the first table refer to the designations on the second table.
4. Oil content designations—Low: 8-12%; Medium: 12-18%; High: 18% and above. Race Guatemalan, Thick Skin; Mexican, Thin Skin; refers to type and not to country of origin.
5. Seventy-five percent of planting and production in California is of the Fuerte variety.
6. Selected "strains" of the Fuerte meet with widely varying success in Area 5—Consult Farm Advisors. No Fuertes are successful in Ventura City and Oxnard districts of Area 5.
7. Fuerte is a failure in Area 2.
8. Hass is established as a commercial variety in Area 3a and is a promising experimental variety in all other districts.

Table 2—Normal Season of Maturity In Designated Areas

Area (1)—San Diego County, Inland
(Fallbrook, Vista, Escondido, La Mesa)

Variety	Season
*Fuerte	November-May
Frey	July 15-Sept. 15
Hass	May-July
*Nabal	June 15-August 15
Stephens Choice	May-August (?)

Area (2)—San Diego County, Coastal
(Chula Vista, Encinitas, Carlsbad, Oceanside)

*Anaheim	May-August
Bonita	July-August
Frey	July-August
Hass	May-July
*Nabal	July-August
Stephens Choice	May-August (?)

Area (3a)—La Habra, North Whittier Heights, Yorba Linda, Whittier

Encanada	July-September
Frey	July 15-September 15
*Fuerte	December-May
*Hass	May-July
Stephens Choice	May-August

Area (3b)—Santa Ana-Capistrano

Anaheim	May-August
*Fuerte	December-May
Hass	May-August
*Nabal	July-August

Area (4)—Foothills, Los Angeles County
(Pasadena, Azusa, San Dimas, Covina)

Variety	Season
Frey	July 15-September 15
*Fuerte	Dec.-April
Hass	April-July

Area (5)—Upper Coastal
(Ventura, Oxnard, Santa Barbara)

Bonita	July-September
Frey	August-October (?)
*Fuerte (See note)	February-July
Hass	June-November
Hellen	September-November
*MacArthur	August-November
*Nabal	August-September

Area (6)—Ventura Co. Intermediate
(Santa Paula, Fillmore, Ojai, Camarillo)

Bonita	July-September
Encanada	August-October (?)
Frey	July-September
*Fuerte	December-June
Hass	June-August
Hazzard	June-July
*Nabal	July-August
Stephens Choice	May-August

Area (7)—Interior
(Riverside, San Bernardino, Corona)

*Fuerte	November-April
Hass	May-July