

## THE AVOCADO IN SOUTH AFRICA

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*Twenty interesting photographs accompanied this article, which we were unable to include in the Year Book for lack of space. Any visitor to the Association headquarters can see them upon request.*

Avocado trees have been grown in South Africa for many years. There are many old West Indian seedling trees in Durban, Natal, that must be well over fifty years of age. Until 1925 the avocado trees in South Africa consisted chiefly of West Indian seedling trees. Attempts have been made to bud the West Indian seedling but nurserymen, in general, were only moderately successful, hence the percentage of budded avocado trees of the West Indian race prior to 1925 was very small, in fact negligible.

About 1925 some Mexican and Guatemalan avocado seeds were introduced into South Africa; one planting, namely at the Belverdere Nurseries, Duivelskloof, Northern Transvaal, has done fairly well. The seedling trees have made remarkable growth, being over fifteen feet tall at five years of age, thanks to the sixty inches of rain per year and a hot, moist climate. The other planting at Benmore Orchards at Durban on the Natal Coast, amid tropical surroundings, has likewise done well. The former planting consists of Puebla, Ganter, Harmon, Fuerte, and Challenge; the latter consists of about 20 varieties, including Fuerte, Dickinson, Taft, Lyon, and Sharpless. The manager of Benmore Orchards, Mr. W. E. Marriott, has found that up to the fifth year, in nearly every case the seedling trees have set fruits, but the fruits have dropped off before reaching any size. This is very different from our experience of budded Mexican and Guatemalan varieties at Alkmaar, Eastern Transvaal, where the trees produced fair crops at three years of age, and good crops at four years of age, the fruit in both cases being very good. The Fuerte seedling in the Benmore Orchards was twenty feet in height at five years of age. When Dr. H. J. Webber, ex-Director of the Citrus Experiment Station at Riverside, California, was in South Africa in 1925, he visited the Benmore Orchards, and was extremely interested in the old West

Indian Seedlings, some of which bear between two and three thousand fruits per tree in favorable seasons. It is the opinion of Mr. Marriott, the manager, that budded trees which bear so early, will never reach the size of these old seedling trees, hence in later years will not bear such enormous crops as the seedlings. It is interesting to note, however, that budded Gottfried trees and budded Itzamna trees at Alkmaar in the Transvaal Low Veld, where tropical conditions prevail, have reached well over fifteen feet at the fifth year. These enormous trees will present many difficulties when the time for pest control arrives, but up till now pest control has not yet been necessary.

## INTRODUCTION OF MEXICAN AND GUATEMALAN VARIETIES

In 1925 a new era can be said to have dawned as far as the South African Avocado Industry was concerned. Until 1925 West Indian avocados were common on all South African markets, the Natal Coast and Transvaal Low Veld supplying most of the markets. In Natal avocados were grown mostly by Indians who produced most of the bananas as well. In the Transvaal Low Veld most citrus growers produced avocados, pa-paws, and mangoes, but in all cases the trees were seedlings. Tropical fruits grow so well in these areas that no one has bothered much about the advantages of budded trees over seedling trees. Growers had to wait from seven to ten years for seedling avocado trees to come into bearing, but this was taken for granted. There are so many areas in South Africa, which are frostless that very little attention was paid to the question of frost resistance. If it were not for this fact, the West Indian race could never have become so firmly established. The failure of the Sexton planting of West Indian avocados at Goleta, California, soon proved that this race was not suited to Californian conditions. But in South Africa there was no failure of any large West Indian avocado planting, hence this became the popular race until the introduction of the Mexican and Guatemalan races *in 1925*.

Dr. Webber in 1925 examined many West Indian avocados in South Africa, and was impressed by the tremendous variation in the specimen examined, and by a general lack of the nutty flavor so common in Mexican and Guatemalan varieties. He found them all to be very low in oil or fat content as compared to Californian grown avocados, the average fat content being around ten per cent. In his opinion they lacked quality and flavor, in general, but some specimens seemed to be far superior to others. No attempt has been made to classify the West Indian varieties, although certain nurserymen list definitely named varieties, which are not generally known by those names and the same fruit might possibly be known under a different name elsewhere. For instance, a Fuerte is a Fuerte almost all over the world, but the named varieties of the West Indian race in South Africa are not sold on the markets under these names but merely as avocados.

In 1925 the South African Department of Agriculture imported some budded avocado trees of Mexican stock from California—it is quite likely that a few trees came from Florida as well.

A few trees were presented to each of the following nurseries in the Transvaal Low Veld, namely: Barclay Vale, Alkmaar, and the H. L. Hall & Sons Nurseries at Mataffin. The Transvaal Low Veld is the area adjoining Portuguese East Africa, and is low in elevation and experiences a tropical climate. Johannesburg, the centre of the goldfields, is 6,000 feet in elevation and this high plateau is known as the High Veld. Pretoria is only 3 6 miles from Johannesburg, but is only 4,000 feet in elevation and, therefore, is much warmer.' At Waterval

Boven, on the Delagoa Bay railway line from Pretoria, the descent is made from the High Veld to the Low Veld and the vegetation changes at once; the former is typified by huge stretches of grass, the latter by Bush Veld.

Barclay Vale is reached shortly after leaving Waterval Boven, but is still fairly high, although frosts are not severe; citrus and mangoes do well here, but certain areas on the Crocodile River banks are somewhat on the cold side. Unfortunately the imported

avocado trees were planted in such an area because of the good depth of soil, and were badly damaged on one or two occasions by frost. The trees given to the Barclay Vale Nurseries and to the Hall Nurseries consisted of Puebla, Dickinson, Queen, Fuerte, Spinks and Sharpless; that is to say, between these two nurseries the six varieties were distributed—each nursery, did not get all six varieties. The Alkmaar Nurseries received trees of the following three varieties: Gottfried, Collinson and Itzamna. The writer is of the opinion that these avocado trees were presented to the Division of Horticulture, Department of Agriculture, South Africa, by the United States Department of Agriculture, Bureau of Plant Industry, and that the selection was made by Dr. Wilson Popenoe. All these imported trees are on Mexican stock.

Alkmaar is on the Crocodile River midway between Barclay Vale and Mataffin where the H. L. Hall & Sons Nurseries are located—these nurseries are also on the banks of the Crocodile River, but it is much warmer here than at Barclay Vale, although the two places are only about twelve miles apart. The railway passes through the Crocodile River Valley, in which all three nurseries are situated, and is the main line between Pretoria and Delagoa Bay.

The imported avocado trees planted at Barclay Vale did very well at first and bore fruit at four years of age. The fruit was of good quality, although the Puebla had a tendency to drop most of its fruit and the Queen was rather slow coming into bearing. Just when these trees were doing remarkably well, a severe frost—rather unusual—gave them a terrible set back, and for many other reasons the trees never again looked so well. These trees have, therefore, played almost a negligible part in the improvement of the industry in South Africa.

The same can be said of the imported trees given to the H. L. Hall & Sons Nurseries at Mataffin. The trees did well for a time, but for many reasons they have also failed to influence the avocado industry in this country to any great extent.

## **THE ALKMAAR CITRUS AND AVOCADO NURSERIES**

The trees presented to the Alkmaar Citrus and Avocado nurseries, consisting of Gottfried, Collinson, and Itzamna have done remarkably well. The manager of these nurseries, Mr. J. Ludman, soon became an avocado enthusiast and paid particular attention to the six imported trees, two of each variety. The writer had just returned from California, where he spent four years attending the University of California, finally taking a Doctor's Degree at the Citrus Experiment Station at Riverside, and was in the Division of Horticulture of the Department of Agriculture in South Africa when these avocado trees were presented to the three nurseries. He found Mr. Ludman to be exceptionally keen, hence he encouraged him to go in properly for the avocado nursery business. Mr. Ludman was advised to make his own importations and not depend any more on the Department of Agriculture.

The Gottfried, Collinson, and Itzamna trees became the nucleus of an up-to-date avocado nursery and gave new life to the avocado industry in South Africa.

The Annual Report of the California Avocado Association for 1925-26, gives the following recommended lists, as far as lists one and two are concerned:

List No. I. Commercial Varieties—Fuerte.

List No. II. Varieties of proven merit, candidates for commercial rating— Dickinson, Dutton, Puebla, Taft.

In 1926 Mr. Ludman imported a few trees of the following varieties from Armstrong's Nurseries: Fuerte, Spinks, Ward, Mayapan, Linda and Dickey A. The Fuerte had long been recognized as the most outstanding variety in California, hence its importation. The Puebla and Dickinson were already among the varieties given by the Department of Agriculture. Dutton was not well known, which accounts for it not being imported at this time. The Taft was such an irregular bearer and took such a time to come into bearing that it was not included in the earlier importations.

The Spinks, Linda, and Dickey A were fairly important in the early days of the avocado industry in California, which accounts for their being included in the 1926 importation. The Mayapan and Ward were regarded as good and regular bearers, and the former as a late variety and the latter as an early variety. For these reasons it was thought they would be suitable for South Africa, and would help to extend the season. Up to this time very few avocados had been exported to England, and so far this part of the business did not prove to be very successful. Thus the first thought was to cater for the local markets.

The six varieties that were imported in 1926 have done well, that is to say the trees have grown remarkably well, and in the hot humid climate of Alkmaar they have made remarkable growth; in fact the growth made in the first five years can be considered as much greater than the writer has seen in young avocado trees in California in a similar period. As far as tropical and semi-tropical trees are concerned at Alkmaar there is no defined dormant period, which accounts for the remarkable growth made in a few years. Alkmaar is 210 miles from Pretoria and 139 miles from Lourenco Marques (Delagoa Bay), the capital of Portuguese East Africa.

The elevation at Alkmaar railway station is 2,480 feet, which is low compared with that of Johannesburg, viz., 5,735 feet. Mr. Ludman planted the imported avocado trees on the slope of the foothills about two miles from the banks of the Crocodile River, hence there is no danger of frost. The name Crocodile River suggests a rather wild country. As a matter of fact Alkmaar is only 40 miles from the famous Sabie Game Reserve, which together with the Isingwed-Zi Game Reserve, forms the Kruger National Park, probably the finest game sanctuary in the world. Thus only a short distance from Alkmaar can be found lions, elephants, leopards, crocodiles, hippopotami, and numerous kinds of other wild animals and buck. Little did Carl B. Schmidt and Dr. Wilson Popenoe ever think, when they were in Atlixco, Mexico, and were studying the parent Fuerte and Puebla trees, that these trees would give rise to a younger generation that would penetrate the wilds of South Africa, thousands of miles from the home of these two famous varieties. The Kruger National Park enjoys a tropical climate and amidst all this wild life numerous game wardens who have fine gardens containing many tropical fruit trees including the avocado, and already the Fuerte, in particular, has been propagated and sent to all parts of South Africa. In recent years roads have been constructed through the "Kruger National Park," hence visitors have the chance to view the wild life from an automobile in comparative safety.

## TWENTY-EIGHT VARIETIES AT ALKMAAR

In 1929 the Alkmaar avocado and citrus nurseries made another large importation of avocados from California—all these trees are on Mexico stock—hence at present there are twenty-eight different varieties growing at Alkmaar. These include Mexican and Guatemalan varieties and hybrids of these two races, and Collinson which is a Guatemalan-West Indian hybrid.

The following list represents the varieties and the year in which they were introduced into South Africa, and planted at Alkmaar, Eastern Transvaal:

<b>Date of Importation</b>	<b>Varieties</b>
1925	Gottfried, Collinson, Itzamna.
1926	Fuerte, Mayapan, Linda, Ward, Spinks, Dickey A.
1929 Lyon,	Anaheim, Benik, Cantel, Dutton, Dickinson, Ishim, Nabal, Caliente, Puebla, Blackbird, Duke, Mexicola, Northrop, Topa Topa, Carlsbad, Panchoy, Prince, Thompson.

No doubt the behavior of these twenty-eight varieties will be watched with much interest, both by South African avocado growers and California avocado growers. It is a very good policy for these growers to exchange ideas and experiences. Here are two countries, California and South Africa, widely separated—in fact they are about twelve thousand miles apart—and yet they have much in common in the way of climatic and soil conditions.

The 1929 Annual Report of the California Avocado Association shows some changes in the recommended lists. List No. 1 remains the same, and Fuerte is still the only commercial variety recommended.

List No. 2 (varieties of proved merit and candidates for commercial rating), however, has seven varieties instead of four as in 1928, namely: Nabal, Puebla, Queen, Taft, Anaheim, Dickinson, and Mayapan.

The writer has not yet seen the Annual Report of the California Avocado Association for 1930, hence during 1929 these eight varieties must be regarded as the eight best varieties in California. The Fuerte is firmly established in South Africa, and has fruited for a number of years. Furthermore many budded trees have already been sold by the Alkmaar avocado and citrus nurseries and have been sent to many parts of South Africa. Of the seven varieties in List No. 2, the Mayapan has fruited for several years and like the Fuerte, budded trees of this variety have been sent to many parts of South Africa.

The Puebla and Queen were planted in 1925 at Barclay Vale, but as explained before these trees have not done well in recent years, partly through neglect and their being planted in a somewhat cold spot. The Puebla has fruited here but has been inclined to drop most of its fruits, and unfortunately just as the Queen showed signs of bearing the trees went into decline. The same is true of the Dickinson which was also planted at Barclay Vale. However, it will be noticed that the Puebla and Dickinson are amongst the

1929 importation, and are doing well at Alkmaar; thus in the near future more definite information will be had of the behavior of these two varieties. Special attention is given to avocado trees at Alkmaar. Therefore, one can expect most of the varieties there to do well.

The Anaheim was imported in 1929 and is doing very well at Alkmaar.

Thus of the eight best varieties in California in 1929 only the Taft and Queen are not to be found at Alkmaar at present, but these two varieties have been ordered, and should arrive at Alkmaar from California in the near future.

In the meantime it is hoped that extra attention will be given to the Queen trees at Barclay Vale and perhaps they might recover their normal condition.

The recommended list No. 4 in 1929, namely varieties most hardy to cold suggested for amateur growers, contains the following six varieties:

Blake, Duke, Topa Topa, Fuerte, Puebla and Northrop. Five of these varieties are now growing at Alkmaar, and it is hoped to import Blake, the only variety of this group not growing at Alkmaar at present.

There is no doubt that a definite attempt is being made by the Alkmaar avocado and citrus nurseries to establish an up-to-date avocado nursery and to give South African fruit growers the chance of obtaining the best varieties possible.

Every year, since 1926, Mexican seeds have been imported from California for stock purposes—in 1930 ten thousand Mexican seeds were imported, and in addition some Guatemalan seeds were imported for experimental purposes. The Transvaal is rather subject to severe hailstorms, and no area in the Transvaal is entirely free from hail. Whilst all areas are not visited by hail every year the fruit grower never knows when to expect hail and is always anxious about it. The degree of severity varies greatly; some years the hail storms wipe out everything, whereas in other years the hail is comparatively small and little damage is done. When immature the avocado seems to be able to withstand quite severe hail storms, and the scars on the fruit caused by the hailstones soon heal over, and the fruit seems to be none the worse for the attack. When mature the hail marked fruits seem to keep just as well as the unmarked fruit. In this respect the avocado seems to be able to withstand hail better than citrus. The avocado tree, in general, has a more dense foliage than the citrus tree, hence the avocados are better protected from hail than the citrus fruits. On the other hand the young avocado fruits are much more subject to wind injury than the young or mature citrus fruits, and have a tendency to drop more easily in strong winds. At Alkmaar the Mayapan seems to withstand strong winds very successfully, and this characteristic might help to explain the reason for the good crops born regularly by the Mayapan.

Hail storms naturally do a great deal of damage to young nursery trees, whether citrus or avocados, and once severely damaged by hail in the nursery much difficulty is experienced in getting them to grow vigorously when planted in the orchard. If a nurseryman in the Transvaal wants to give his customers satisfaction always—and after all this should be every nurseryman's aim—it will be necessary for him to protect his citrus and avocado nursery with hail proof netting wire. This is naturally an expensive item, but if the nursery stock is valuable, this is only good insurance.

In South Africa at present the average price charged by nurserymen for citrus trees would be about fifty cents. This is much less than in California, but then one cannot guarantee that bud selection has been carefully practiced and that the parent trees are of high performance. Whilst the price at Alkmaar of a budded avocado tree is \$2.50, the expense of importing the seeds and tending same until the stocks are budded works out at about fifty cents per stock. This allows for seeds failing to germinate, but does not include the cost of tending the budded tree or take into account budding failures. In South Africa the cost of importing the parent trees amounts to a great deal, because some consignments from California are almost total failures, most of the trees arriving dead. It is really a wonder that any of the trees can stand the twelve thousand miles and arrive in the Transvaal alive. Strangely enough some avocado trees from California and Pecan trees from Texas have arrived at Alkmaar in perfect condition. It all seems to depend on the treatment received on the way, and on the climatic conditions experienced during the voyage.

The Alkmaar avocado and citrus nurseries have decided to cover their avocado nursery with hail proof netting wire, since each stock has a potential value of \$2.50. Photo 1 shows a portion of the avocado nursery at Alkmaar. In the photo can be seen the stocks. Some have just been budded and the others are either being budded at present or will be budded in spring—and the poles being put up to support the hail proof netting wire. On the left of the photo in the foreground are some Guatemalan stocks, and on the right the Mexican stocks. The former have actually made a better growth than the latter. The Mexican stocks are the regular stocks used for budding and form the greater part of the stocks in the nursery. The Guatemalan stocks will be budded for experimental purposes only. In the background of photo 1 can be seen the rolling hills covered with bush and huge round rocks—a feature of the surrounding country. The citrus grove in the background consists of a red sandy loam, although the predominating soil type in this area is a decomposed granite. These stocks, shown in the photo, are from seed imported from California and they have done remarkably well and are very vigorous and healthy. The uniformity of these stocks is another marked feature, and should give rise to good trees.

## **INTEREST TO CALIFORNIA GROWERS**

California avocado growers are very well acquainted with matters pertaining to avocado culture in Cuba, California, Florida, and the Hawaiian Islands as a result of the Annual Reports of the California Avocado Association, which are full of valuable information. But this is probably the first time that an attempt has been made to acquaint California avocado growers with the position in South Africa since the introduction of Mexican and Guatemalan avocado varieties. The position in South Africa is far different to that in California. Whereas there is an enormous market in the United States and Canada for avocados, and consumers are prepared to pay large prices for the fruit. In South Africa there are only about two million whites and they have been used to obtaining West Indian avocados in large numbers at an average of ten cents per pound. In fact in Natal, during the winter months, West Indian avocados are so plentiful that they are sold for less than ten cents per pound. During the summer months the supply of West Indian avocados drops considerably, and the demand is fairly good, fine avocados realizing

about twenty cents per pound. Growers with enormous old West Indian seedling trees, however, do very well at these prices as the cost of production is very low and some of the largest trees produce as many as two thousand fruits per tree in good seasons. On the Natal coast where the rainfall is high, many avocado orchards are never cultivated or irrigated and pest control is unnecessary, resulting in very little upkeep of the orchard— in some cases the trees are fertilized very occasionally and yet seem to pay the growers.

## THE FUERTE

The Fuerte has done very well in South Africa and it seems more than likely that this variety will become the outstanding variety in this country as in California. The markets in South Africa have not yet become so discriminating as those in the United States, and until such is the case and an export trade to England is developed a variety will have to have other good qualities besides having good marketability value. Popularity on the markets is not sufficient and for South African conditions, at present at least, good bearing qualities are equally necessary. Thus a variety like Taft will probably not be as popular in South Africa as the Itzamna, Mayapan, and even Ward varieties, which have borne well consistently.

The Fuerte, so far, has made good growth; photo 2 shows a Fuerte at Alkmaar four years after planting, and photo 3 a Fuerte at Alkmaar five years after planting. During the fifth year the Fuerte tree began to assume a spreading nature, as distinct from the upright growing habit of the Mayapan, but in comparison with the Gottfried, Collinson, and Itzamna—the trees at Alkmaar of these varieties are a year older than the Fuerte— would be classed at medium in growth as far as vigor is concerned.

Photo 3 A is a bad photo but gives one a good idea of the growth of the Fuerte at 4½ years of age.

Photo 4 shows a bunch of Fuerte avocados on a tree five years of age, and photo 5 shows a close-up of three avocados off this tree. As can be seen from photo 5 the fruit is of good size and excellent quality. The writer can find no difference in the quality, size, flavor, and appearance of the Fuerte grown in California and that grown at Alkmaar. Without a doubt the Fuerte fruit is the avocado par excellence, but in South Africa, so far, it cannot be said to be the best and most consistent bearer. It would seem that in California the Fuerte has not borne well and consistently in all parts and although it is still, and probably, will be for many years, the leading variety, there are certain other varieties that, at least, from a bearing point of view will prove superior to the Fuerte. However, the only point that matters, is the return per tree, and if the Fuerte, owing to superior quality and flavor, can return more per tree or acre than any other variety, it is entitled to be called the leading *variety*. The Itzamna, Mayapan, and Gottfried have borne more consistently than the Fuerte and the Ward has also borne more consistently than the Fuerte, but is not a vigorous grower and the tree is much smaller than the Fuerte tree, being a semi-upright grower.

## THE MAYAPAN



The Mayapan, one of the varieties on the list No. 2, recommended by the Variety Committee of the California Avocado Association as varieties of merit and candidates for commercial rating, is doing remarkably at Alkmaar and is likely to become one of the most popular varieties in South Africa because it bears well and consistently, and its thick skin, which is a disadvantage in the United States, owing to fruiterers allowing the fruit to become over-ripe at times and selling them in this condition, should be an advantage in South Africa because the thick skin should result in better keeping quality—a requisite from an export point of view. Trial shipments of Mayapan avocados to England have already been made with success, and this variety promises to become a good export variety. Mayapan avocados kept with West Indian avocados at room temperature have shown far superior keeping quality than the latter. Picked at the correct time Mayapan avocados will keep for two weeks and longer at room temperature. Besides the market in South Africa has not become as discriminating as that in the United States, hence the general objection to the thick skin of the Guatemalans is not likely to operate in South Africa for some time to come. The quality and flavor of the flesh of the Mayapan is very good, and so far superior to the average West Indian avocados—which are a mixed lot—on the South African markets that the Mayapan is likely to become very popular in South Africa. The Mayapan tree bears well and consistently, and is very hardy and vigorous. So far at Alkmaar it has borne well every year, and the large, round fruit is quite a curiosity as far as the shape of avocados is concerned.

Photo No. 6 shows a fine Mayapan tree at Alkmaar 4½ years after planting and photo No. 7 shows a fine cluster of fruit off the same tree. As mentioned before the Mayapan stands up well against wind storms and the fruit hangs on well

## **THE ITZAMNA**

The Itzamna is an exceptionally fine variety, and has done very well at Alkmaar. The tree is very vigorous and has borne good crops of fine fruit every year. The tree is much more vigorous than the Mayapan, and owing to its spreading habit, combined with height, it is a much larger tree than the Mayapan and will naturally carry more fruit. The Itzamna fruit is much superior to the Mayapan, hence in the opinion of the writer the Itzamna is a much better variety than the Mayapan, at Alkmaar at any rate, yet the Mayapan is ranked higher than the Itzamna in California. It would seem that the Itzamna would merit promotion to list No. 2. Photo 8 shows a six-year-old Itzamna tree at Alkmaar. This tree bore fruit at three years of age and a good crop at four years of age, and the fruit is exceptionally fine, resembling the Fuerte somewhat. This is a particularly fine growth for six years, and it is doubtful whether one could find anything much better anywhere. The writer is full of praise for this variety, and regards it as our second best variety of those fruiting so far at Alkmaar. It would be interesting to know whether the Itzamna has also gained in favor in California. In the Hawaiian Islands it seems to be making a name for itself. The Itzamna so far has beaten the Fuerte, as far as yield is concerned, at Alkmaar and its future performance will be watched with interest. It is also a good late variety and, therefore, valuable.

## **THE GOTTFRIED**

The Gottfried is another fine variety for this country. It is very hardy and the most vigorous grower of the nine varieties tested so far. It should, therefore, make a good stock as it is Mexican. Photo No. 9 shows a six-year-old Gottfried tree, and is the largest six-year-old avocado tree the writer has ever seen. In fact the growth is so remarkable that it is almost unbelievable, and it just shows what trees will do in a hot humid climate. The writer can vouch for the age of the tree as he has seen it grow up. Photo No. 10 shows a fine cluster of Gottfried avocados, and photo No. 11 shows an individual Gottfried avocado of the tree in photo No. 9.

The Gottfried trees have borne well and consistently and being so large good crops have been harvested. The fruit is pyriform but distinctly necked, and the quality and flavor are very good. This variety is the first to ripen of the present varieties, and ripens in January (summer in South Africa) when there are hardly any West Indian avocados on the market, which is a distinct advantage. For the colder areas in South Africa this variety is particularly suited

## **THE WARD**

The Ward ripens in February in South Africa, before the bulk of the West Indian avocados arrive on the markets, hence is in great demand like the Gottfried. The Ward does not seem to be regarded as a good market variety in California. The fruit at Alkmaar is of good size, and keeps well; furthermore it contains very little fibre, and the flesh is of good quality and flavor and infinitely superior to the average West Indian avocados on the South African markets. Photo No. 12 gives one a good idea of the Ward fruit. The tree does not attain a great height, but is hardy and what it lacks in size it makes up for in bearing, being a prolific, precocious and consistent bearer. It will, therefore, be popular in South Africa.

Photo 13 shows a 4½ year-old Ward tree in bloom at Alkmaar, and the semi-upright habit is distinctly shown. In comparison with some of the other varieties, notably Gottfried, Collinson, and Itzamna, its growth is small but this does not seem to interfere much with its yield.

## **THE LINDA**

Photo No. 14 shows a four-year-old Linda at Alkmaar. It has a somewhat spreading habit like the Fuerte and Dickey A. The Linda has grown very well but its bearing has been somewhat disappointing. The large fruit is of good quality and flavor, but this variety is not a good and consistent bearer. However, its behavior in the future will be watched with interest.

## **THE DICKEY A**

The remarks made about the Linda can be applied to the Dickey A. The trees have made excellent growth, and the quality of the fruit is good, but the tree is not a heavy,

nor a consistent bearer. However, both the Linda and the Dickey A will be of importance to growers in South Africa since the fruit is superior to the average West Indian avocados on the South African markets, and they will help to keep the markets supplied all the year round. Photo No. 15 shows a five-year-old Dickey A avocado tree at Alkmaar.

### **THE COLLINSON**

The Collinson is a vigorous grower, and although not a heavy or consistent bearer, the large tree bears a good amount of fruit of very good quality. The fruit is very attractive, and some of the characteristics of the West Indian race are apparent. Photo No. 16 shows two six-year-old Collinson trees at Alkmaar, and it is evident that they have made remarkable growth.

### **THE SPINKS**

The Spinks seems to have become very unpopular in California in recent years, and this unpopularity seems to be due to the fact that the flesh around the seed turns black. The writer is inclined to agree with Dr. Coit that much of this trouble is due to the fruit being picked at the wrong time and allowing the fruit to become too soft before eating it. The writer has found that if the fruit is allowed to color up well before being harvested, and is then eaten just as the fruit shows signs of softening most of the fruits will not show any blackening of the flesh. However, from a marketing point of view, this is a decided disadvantage, and this is a great pity because the Spinks is a good and consistent bearer, and the quality of the flesh is good when the blackening of the flesh is absent.

Photo No. 17 shows a five-year-old Spink tree at Alkmaar. Its growth may be described as medium, compared to some of the other varieties, but good nevertheless. As will be judged from photo No. 18, the Spinks has borne good crops at Alkmaar. For home gardens the Spinks can still be recommended, because growers will soon learn the characteristics of this variety and know how to overcome the great fault associated with this variety, namely the blackening of the flesh around the seed.

Of the Mexican and Guatemalan varieties now being sold in budded form, the Gottfried and Ward are the earliest, reaching the markets before the West Indian avocados from Natal arrive in large quantities. They have, therefore, been in great demand, and have realized good prices. The Mayapan and Itzamna are the latest and arrive when the West Indian avocados are off the markets, and likewise realize good prices. The Fuerte is harvested in South Africa from March until August, and by far the best variety.