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SUGGESTIONS FOR GRAPEFRUIT CULTURE

— IN —

SAINT LUCIA

BY

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During the past few years the world's production of grapefruit has increased very rapidly and this increase in production will continue for some years to come. Great Britain is importing grapefruit on an ever increasing scale and there are strong indications that this increase in consumption will continue for some time to come. The development of the English grapefruit market is of recent date, as can be seen from the following figures, abstracted from the Empire Marketing Board Fruit Intelligence Notes of February 22, 1928.

IMPORTS OF GRAPEFRUIT INTO THE UNITED KINGDOM IN BOXES.

Year.	South Africa.	British West Indies.	Other British Countries.	U. S. A.	Other Foreign Countries	Total.
1921	2,440	8,770	254	17,923	4,931	34,318
1922	10,216	8,854		30,689	800	50,559
1923	12,509	16,877	1,170	45,105	4,418	80,238
1924	15,768	15,787	925	93,689	4,018	130,186
1925	21,837	28,171	784	200,071	17,353	268,186
1926	20,997	43,486	2,688	239,847	25,939	332,956
1927	23,907	47,493	8,926	501,314	24,829	606,468

In six years the quantity of grapefruit entering the United Kingdom has increased from 34,318 boxes to 606,468 boxes and a further increase is to be expected.

The United States are the source of the bulk of this fruit, Florida being the chief producing centre. Should production increase to any marked extent in the United States, it is reasonable to expect that there will be an increase in the quantity exported. A marked increase in grapefruit production in the United States will occur in the very near future, as can readily be seen from the following figures:—

Area	Total	Non-bearing	% Non-bearing to total acreage.
California	11,183 acres	5,501 acres	49.2 per cent.
Arizona	2,920 „	1,679 „	57.5 „
Florida	80,037 „	19,427 „	24.3 „
Texas	50,000 „	48,000 „	96.0 „

Since publication of these figures in 1926 there has been very extensive planting carried out in Arizona.

The British West Indies are in the fortunate position of being able to produce and market grapefruit in the United Kingdom at a lower cost than any of the grapefruit producing areas of the United States. Further, in the Canadian markets the British West Indies, including British Honduras, have a preference of 75 cents a box over grapefruit from the United States.

The following figures show the quantities of grapefruit imported by Canada from 1922 to 1926, in boxes.*

From	1922	1923	1924	1925	1926
U.S.A	205,605	241,470	269,775	302,955	264,780
Jamaica	15,000	10,095	6,465	7,230	12,660
Other countries	4,200	7,800	8,790	3,435	2,385

The United Kingdom markets are not readily accessible to producers of fruit in St. Lucia, although by transshipment at Barbados the position is rendered much more favourable than exists in Jamaica, for example. With direct, regular communications between St. Lucia and Canada, a matter that will be realized, it is hoped, by the end of 1928, it would seem most advisable that the attention of St. Lucian planters should be centred on the Canadian, rather than on the English market, in regard to grapefruit. A considerable volume of fruit is an essential requirement for a successful entry into the well-established and intricate fruit markets of England and a sufficient volume cannot be obtained from less than approximately 500 acres of trees. The writer would hesitate to advise the planting of such an acreage in St. Lucia until more information, based on experience of the planters, is available.

* From "Foreign Crops & Markets," Vol. 14, No. 8, U.S.D.A. Bureau of Ag. Econ., on the basis of 15 boxes per 1000lb.

It would seem most advisable, however, to plant 100 or 200 acres of select grapefruit for the purpose of marketing it in Canada. In addition to this market there is an excellent market to be found in Barbados, and it is surprising that so little has been done in the line of developing this adjacent market.

The question of orange growing for export to England or Canada can be eliminated from discussion as, aside from other reasons, the appearance of oranges grown in the tropics leaves much to be desired. Orange growing with the object of marketing the fruit in Barbados is a different matter and every effort should be made to push this matter. The growing of fruit of good quality is essential and it will probably be advisable to eliminate much of the seedling fruit now being grown and to substitute for it orange varieties of known quality. Good packing, careful handling and care in shipping are points that every grower should appreciate fully.

As there is no commercial grapefruit production in St. Lucia, planters can begin the production of grapefruit in such a way as to avoid the unnecessary mistakes that have too often been made in other countries. It should be kept clearly in mind that the grapefruit is not a crop that can be grown as a secondary crop; it should never be planted with cacao, coconuts or any other crop. Production depends on suitability of climate, the type of grower, the site, the soil, the type of tree and the care given to the tree. Unless all of these points are suitable, satisfactory results cannot be expected, nor will they be realized. The grapefruit is a crop with an exceptionally high value per acre but this high value per acre cannot be realized by a "laissez faire" policy of management.

The planter who is not prepared to give careful attention to the points mentioned above, should grow some crop demanding less attention and less exacting conditions.

SOILS.

The best soil for grapefruit is a deep, medium loam that is fertile and well drained. Such soils can be found to a limited extent in the Soufrière area and to a more marked extent in the Marquis Valley. Some of the flat, alluvial soil on the estate of Mr. E. J. Gallop are admirably suited for grapefruit production. It is unfortunate that the bulk of the soils of St. Lucia are very shallow and are very lacking in humus. The hillside lands are not suited to grapefruit growing because of their shallowness and low content of organic matter. Clearing of the natural bush on the hillsides will undoubtedly mean rapid depletion of the shallow layer of humus on the surface. Heavy rains will soon wash the good soil down into the valleys. Grapefruit, therefore, should not be planted on newly cleared hillsides but should be confined to the valleys and the surrounding gentle slopes, where such exist.

Planters should choose a medium loam, rich in organic matter, well drained and three to four feet in depth. A loam that is underlain at two feet with impervious clay, is unsuitable. Heavy clay soils are undesirable because of the fact that "gummosis" and other crown root diseases develop most readily in such soils.

A poorly drained soil is undesirable as free water in the soil for any length of time prevents proper root growth and may cause the death of the trees.

It is quite probable that fairly large areas of suitable soil can be found in some of the sugar plantings. The bulk of the sugar is planted on heavy soil with a water table within 3 feet of the surface but along the rising borders of some of the sugar estates, as in the Cul-de-Sac valley for example, suitable soil can probably be found. Much additional land could undoubtedly be made available through the creation of open drains dug to a depth of four or five feet. Such drainage would lower the water table and, where the soil is of the right texture, make it suitable for grapefruit.

NURSERY PRACTICE.

After the choice of a site on which to establish a grapefruit grove, the grower must secure the necessary nursery trees. It is impossible to secure nursery trees in St. Lucia and it is impossible for the grower to propagate his own trees because of the lack of any good bearing trees from which bud-wood can be cut. Promiscuous importation of nursery trees from a foreign source is unwise because of the danger of introducing new insect pests or diseases. Importation by the Department of Agriculture, from a reliable source, is quite safe and if any planting is to be done in the next few years, is essential.

For export purposes, Barbados excepted, no planter should set out less than five acres. To plant less means an investment that is not sufficient to compel the planter to give the grove careful and conscientious care. A planting of two or three acres can be neglected with no great loss; the resulting failure will usually be ascribed to the fact that "grapefruit doesn't pay." Care and attention are more apt to be given when the grove is large enough to make its loss rather serious.

The importation of nursery trees and bud-wood should only be carried out for a short time and steps should be taken to ensure a supply of locally grown trees for plantings of two or more years hence.

The best root stock for the West Indies is the Seville or sour orange. A better stock will no doubt be found but many years must pass before the value or lack of value of a given stock may be determined. Stocks such as the shaddock, grapefruit, rough lemon, *Citrus hystrix*, etc., should be tried experimentally and the sour orange should be used commercially.

Seed should be obtained from healthy, vigorous, well grown trees, preferably old ones, and should be planted as soon as possible after its removal from the fruit. It is undesirable to allow the seeds to become dried out before they are planted as if this occurs, a considerable number will develop crooked tap roots.

The seedbed should be well drained and preferably should be of light soil. The seedbed can be made to cover any area desired but for convenience in weeding it is well to lay it out in belts or strips about four feet wide. The length is immaterial. Between each four-foot bed should be left a path 18 inches to 24 inches wide.

The soil should be spaded up deeply, should be finely pulverised and levelled. The seed should be planted in rows about 6 inches apart, the seed being set 1 inch apart in the rows. A strip of narrow wood pressed lightly into the prepared seedbed will form a very shallow furrow into which the seeds can be placed. Some soil should be raked or scraped over them and then about $\frac{3}{4}$ " of sand should be sifted over the entire seedbed.

A fungus disease, "damping off," is frequently troublesome when the seedlings are young. It attacks the little seedlings at the surface of the ground and can be prevented by providing adequate drainage, by allowing the surface of the soil to dry out quickly (hence the sand mentioned above), by avoiding heavy soils and by keeping the seedbed reasonably free from organic matter.

The seedbed should be watered when necessary but should not be kept too moist. It should be kept entirely free from weeds and insect pests.

When the seedlings are 6 inches to 8 inches high, they can be transplanted to the nursery. The seedbed should be thoroughly soaked and each row of seedlings should be forked up, thus allowing them to be removed without injury to the roots. It is of the utmost importance that all small, weak, diseased seedlings and those with crooked or deformed roots should be destroyed. Probably 50% of the seedlings will fall in this category and for this reason double or treble the required number of seedlings should be grown.

When the transplanting is done, it will be found that the seedbed contains seedlings of varying size. Some, for example, will be 8 inches in height, others will be only 4 inches. Upon examination, some of the small ones may be found to have been injured or to have been planted on a poor piece of soil. The bulk of the small ones, however, will be just as sound as the large ones. All dwarf, under-sized trees should be destroyed whether the reason for their small size be apparent or not. In most cases *the smaller seedlings are of an inherently slow-growing type* and as such they can never make as

large a tree or as productive a tree as the more rapidly growing and more vigorous type. *Destroy them.* Drastic culling of the seedbed is inexpensive but of great importance.

The nursery site should be of light soil and well-drained; it should be level and free from stones. It should have been spaded up at least 12 inches deep, should be well-tilled and kept free from weeds.

The seedlings are taken from the seedbed and after the tops are cut back an inch or more they are placed in wet sacking to prevent drying. They should be planted in nursery rows about four feet apart, being set 12 inches to 15 inches apart in the rows. The soil should be moist before the seedlings are planted and should be watered immediately after they are planted. This is best done by running water in furrows along each row.

The planting of the seedlings should be done with a flat dibble or a trowel and great care should be taken to see that the seedlings are not pushed into the ground in such a way as to cause any bending of the delicate tap root. Should the tap root be bent, the tree will be found to have a deformed root when it is moved from the nursery.

Budding can be done when the stocks have a diameter of $\frac{3}{8}$ " to $\frac{1}{2}$ " at the height at which the bud is to be inserted. During the development of the seedling to this size, all shoots should be rubbed off in order that a single, straight little tree may be secured. Under conditions of medium to heavy loam and alluvial silt soils, budding should be done about 10 inches from the ground. High budding reduces the risk of of gummosis. The bud union itself is particularly susceptible to this trouble and should be kept a safe distance from the ground.

All small trees should be destroyed at the time of budding. Severe culling in the seedbed materially reduces the number of under-sized trees that will be found at the time of budding.

The actual operation of budding is doubtless familiar to most planters and need not be discussed in this paper. Should it be desired, details can be secured from Mr. E. A. Walters, Agricultural Superintendent or from any standard horticultural publication. The bud-wood should be young and plump, old wood containing too many dormant buds and young, angular wood containing very little stored food reserves and being difficult to handle.

When the bud has grown out about 9 inches, the stock can be cut away about an inch from the bud union. This little stub should be cut away entirely when the bud growth reaches 18 inches, the cut made slanting in order that it may heal over cleanly and soon. The cut should be painted with a wood preservative.

The staking of nursery trees leads to the production of straighter trees than would otherwise be the case. A flat stake about 38 inches long should be driven into the ground beside each tree soon after the

bud begins its growth and the bud growth should be tied to this stake from time to time as it continues its growth. The base of the stake should be dipped in tar before it is driven into the ground.

When the tree reaches 36 inches in height it is headed 28 inches to 30 inches from the ground. This causes several shoots to be thrown out, of which 4 to 6 are left and the balance removed. These main scaffold branches should be spaced for 6 inches to 12 inches vertically on the young trunk; in other words, they should not arise from a small space as when this occurs a weak head is formed.

When the main scaffold branches have developed sufficiently to have passed the succulent, tender stage of new growth, the young tree is ready for removal to the grove. The nursery should be irrigated well the day previous to that on which the removal is to be done. A trench dug on one side of each row greatly facilitates removal of the trees. The scaffold branches are cut back to about 6 inches in length; any leaves remaining can be left.

At the time of transplanting, all small, weak trees should be destroyed as they are inferior to the strong, well-grown trees *and will always remain so*. All trees with deformed roots should also be destroyed.

A good nursery tree cannot be produced for less than 2/- to 2/6.

The theory of bud variation and selection need not be discussed herewith. Suffice it to say that from a good parent tree can be propagated trees possessing the same characteristics; from a poor parent tree good trees cannot be propagated as the asexually propagated descendants of a tree possess the same characteristics as the parent tree from which they are budded. Thus it would be foolhardy to propagate a commercial grove from any of the inferior seedling trees that can be found in places in the Island.

Every propagator of grapefruit (or oranges) should propagate trees only from parent trees of known inherent character. The parent tree must be *known* to produce fruit of the type that the grower desires. As an occasional "mutation" or bud variation occurs, it is not safe to take budwood from a non-bearing tree as it is possible that the young tree may not be "true to type."

PLANTING AND CARE OF THE YOUNG GROVE.

Directions for the actual laying out of a grove can be secured from such books as Wickson's "California Fruits"; Coit's "Citrus Fruits"; Hume's "The Cultivation of Citrus Fruits" and Powell's "Grapefruit Culture in the West Indies."*

When the planting holes have been dug, the nursery trees should be brought into the field, a few at a time as needed. It should be remembered that citrus trees do not live because of transplanting but

* In preparation, to be published late in 1928.

in spite of it. They should be handled carefully and should not be allowed to dry out. The roots should not be exposed to the sun even for five minutes but at all times should be protected with wet sacking. Any broken or injured roots should be cut away beyond the injured point and any very long roots should be shortened.

In placing the nursery tree in the planting hole, care should be taken to avoid any bending or cramping of the roots.

One of the chief causes of gummosis is deep planting. The young nursery tree should be planted as high as possible. If the crown roots are just showing, the planting has been well done. No manure should be placed in the planting hole as to do so means sinking of the soil above it with consequent subsidence of the tree.

Whitewashing of the trunk will prevent injury from sunscald and is recommended for the first year after planting.

All grapefruit trees should be planted from 25 to 30 feet apart. A planting distance of 25 feet by 25 feet will give 69 trees per acre.

Young trees should be given an occasional pruning which should consist solely of the removal of poorly placed branches. Suckers or water sprouts should be rubbed off before they pass the succulent stage. No growths should be allowed to develop on the trunk below the scaffold branches. A careful inspection of each tree must be made at least every 2 months and many conscientious growers inspect each tree every month. This work must be done by the planter himself as it requires careful thought and judgment. It is not work that can be left to the casual labourer.

Weeds and bush should be cutlashed whenever necessary. Such growth should never be allowed to become so rank as to interfere with the growth of the young trees. At all times an area extending at least six feet on each side of each tree should be kept clean and in this area vegetation should never be allowed to develop to a height exceeding two feet.

Until the trees come into bearing, the principal care of the grove will consist of controlling weed growth and an occasional light, corrective pruning. Should any scale insects attack the young trees they should be thoroughly sprayed with one of the usual sprays used for such pests, such as whale oil and soap, resin wash, soap and water, or the commercially prepared insecticides.

The writer can give no specific recommendations regarding fertilization because of a complete lack of young or bearing groves in St. Lucia. In general, however, it would seem that soil fertility and tree health and productivity under conditions of heavy rainfall and high temperatures can best be maintained through maintaining or supplementing the humus content of the soil.

In semi-arid countries such as California, Spain, Palestine or South Africa the item of fertilization forms a considerable portion of the grove expenditure. In Florida, the general practice is to apply large quantities of commercial fertilizers every year. The average soil in Florida, however, is very poor.

The soil fertility problem in the West Indies as a whole is purely one of a tropical nature and experimental evidence from the countries mentioned above can be disregarded because of differing soil and climatic conditions.

The writer is able to recommend the practice of "bush mulching." It consists of cutlassing the weed growth in the grove from time to time during the year and letting the cut grass remain on the surface of the soil between the trees. If this proves to be insufficient, grass and small bush from adjacent land is cut and strewn through the grove.

Mulching alone may prove to be insufficient over a long period of years. It is quite possible that it may be found advisable to supplement mulching with the use of pen manure or commercial fertilizers or both. No information is available on this point, nor can it become available for a number of years. It is strongly recommended, therefore, that the primary object of the planter should be the maintenance of the organic content of the soil. As long as the trees under the mulching system make satisfactory growth, bear well and have a healthy, green appearance there is nothing more to be desired. Should production decline and the trees appear pale and show a lack of vigour, the planter should take steps to ascertain the cause. The use of commercial fertilizers is expensive and should only be resorted to when all other factors have been explored, such as disease, insect pests, or *poor drainage*.

The chief object of cultivation of the soil is to conserve moisture through the destruction of weeds. In the West Indies in general, and St. Lucia in particular, the rainfall is sufficient for the needs of both the trees and the weeds. Actual tilling of the soil under such conditions is unnecessary.

VARIETIES.

The country that produces a large quantity of fruit of a small number of varieties is able to approach uniformity of its product far more than a country that grows many varieties. Uniformity of a given product is of great value in the large markets and this point is so evident that it need not be discussed here. As it is apparent that the West Indies in general intend to extend the grapefruit trade to a marked degree it would seem that uniformity of varieties of grapefruit in all the Islands should be approached as closely as possible.

The grapefruit trade of the West Indies as a whole will probably reach a degree of development which is not realised at present and it is quite possible that the marketing of West Indian grapefruit in ten years from now will be handled as a unit and it will undoubtedly be found desirable to carry out the marketing through the medium of a central distributor in London. If such should be the case it will be found that uniformity of the fruit through the Islands as a whole will be a very great asset.

The growing of seedling trees is a practice which should be severely condemned. It has been stopped in all the leading fruit areas in the world such as California, Texas, Arizona, Florida, Porto Rico, Spain, Palestine, and South Africa. The seedling tree is undesirable because the fruit produced is extremely variable and generally of very poor shipping quality; the quality of the fruit itself is usually inferior; the tree is tall, upright, very thorny and takes a much longer period to come into bearing than does the budded tree. Budded trees of a given variety are remarkably uniform and produce uniform fruit. The trees are low and spreading, making the fruit easier and cheaper to pick. The tree is free from thorns. The sour orange root stock is resistant to gummosis on heavy soils, seedling grapefruit trees are susceptible to gummosis. In view of the severe competition in the large markets, it is of the utmost importance that St. Lucia should acquire a reputation for uniform fruit of high quality. High quality in itself is not a guarantee of satisfactory returns. A product of medium quality, but of absolute uniformity, has a much better chance of securing market preference. For example, Sunkist oranges are by no means the finest oranges in the world yet because of their uniformity they demand a premium over all others. It is strongly recommended that the varieties of grapefruit which should be planted in St. Lucia, as well as other parts of the West Indies, should be the Marsh Seedless, Duncan and Walters. Additional varieties may be found to be entirely suitable but unless they prove to be much better than the three varieties mentioned it would be better to concentrate on these three varieties alone to the exclusion of all others.

MISCELLANEOUS.

St. Lucia is in the unique position of having a large undeveloped market within easy reach and it is difficult to understand why active steps have not been taken to exploit this market. Barbados, with a population of 175,000, should be able to take all of the fruit that can be produced in St. Lucia for many years to come. The planting of oranges with the object of exporting to the United Kingdom and to Canada is not recommended, but the planting of commercial groves for the purpose of shipping fruit to Barbados would seem most desirable. The writer has not been able to see any of the oranges produced here, but as the trees are all seedlings, it is safe to guess that the bulk

of the oranges are of very inferior quality. Budded oranges of selected varieties should be planted. The building up of an export trade with Barbados on the basis of seedling oranges would be decidedly unsound because at any time in the future one or more of the neighbouring Islands might conceivably enter this trade on the basis of the shipment of fruit of choice varieties. Seedling fruit would be at a great disadvantage under such conditions. A very profitable trade could undoubtedly be found in the shipment of the papaw to Barbados. The fruit can be shipped a comparatively long distance if handled very carefully. Numerous growers in South Africa are shipping the papaw up from 1,000 miles without refrigeration. Extreme care in handling, picking and shipping is essential. A recommended planting distance is 10 feet by 10 feet. The trees should be replaced with new ones at least every four years as the fruit produced by old trees is very small. The marketing of citrus fruit is as important as the actual production of the fruit. The fruit must be picked, packed and shipped under such conditions as will ensure its arrival in the market in a condition that will make it attractive and satisfactory to the trade, whether that trade be the well established and exacting wholesale trade of the United Kingdom or the more elementary trade of Barbados. The chief causes of decay in oranges or grapefruit are the blue-contact and green moulds (*Penecillium italicum* and *Penecillium digitatum*). These moulds usually attack citrus fruit only at a point of injury, therefore if the fruit is shipped free from mechanical injuries the loss from decay in transit due to blue-contact and green moulds will be reduced to a minimum. In the citrus fruit areas of the United States and to a rapidly increasing extent in South Africa, the prevention of mechanical injury to the fruit is secured by a strict adherence to the following points:—Pickers are equipped with gloves in order that finger nail scratches may be avoided. Fruit should never be dropped or bruised at any stage of the handling. Clippers of the Tuttle design should be used exclusively. The fruit should be placed in suitable containers and these containers should be thoroughly shaken out before any fruit is placed in them in order that any foreign material such as twigs or small grains of sand may be removed. Pickers and all handlers of the fruit should be taught to appreciate the fact that careful handling means less decay. Impress on them that a grapefruit or an orange is a highly perishable article and that it should be handled as such. The thick skin of citrus fruit is in no way a protection against decay. Fruit should be picked carefully in order to avoid clipper cuts.

The stem should be cut flush with the "button" but should not be cut so close as to injure the "button." No long stem should be left as other fruit coming in contact with the projecting stem will be injured. If a stem is left even a thirty-second of an inch long it forms a ready point of injury to other fruits. Fruits should never be piled on the ground. In commercial plantings of grapefruit, field

boxes should be provided, the dimensions of which will be mentioned in a future publication. For oranges to be shipped to Barbados, the use of field boxes is probably not necessary. Well padded baskets will probably be found satisfactory for the conveyance of the fruit from the tree to the packing house. Such a container should be entirely free from hard points or projections of any kind. Should the trade with Barbados reach an appreciable degree of development it is suggested that trials should be made in the reduction of decay through the use of a solution of Bicarbonate of Soda. Fruit should be left for 4 or 5 minutes in a solution of 4% to 5% Bicarbonate of Soda at a temperature of 90° F. Further details regarding the picking and packing operations will be found in the book "Grapefruit Culture in the West Indies" by the writer, to be published at the end of this year.

SUMMARY.

1. Grapefruit imports into the United Kingdom for the past six years have increased very greatly and a still greater increase is taking place at present.
2. Grapefruit production in the United States at present equals approximately 10,000,000 cases annually and the indications are that this production will reach at least 15,000,000 cases in the near future with a resulting increase in exports to the United Kingdom.
3. The British West Indies are able to produce and market grapefruit in the United Kingdom at a lower cost than any of the grapefruit producing areas of the United States.
4. In the Canadian markets British West Indian grapefruit is given a preference of 75 cents per box over grapefruit from the United States. With the inauguration of the new Canadian Steamship Service which is expected at the end of this year, there is no reason why grapefruit from St. Lucia cannot be placed in the Canadian markets at a profit.
5. Planting of grapefruit in St. Lucia for shipment to Canada is recommended.
6. The best soil for grapefruit is a deep, medium, alluvial loam that is fertile and well drained. Such soils are to be found in St. Lucia to a limited extent. Hillside lands should be avoided. Heavy clay soil should be avoided. Land with a water table three feet or less from the surface should be avoided.
7. The success of a planting is to be found not only in the site itself but in the character of the trees. The planter should secure the best nursery trees it is possible to obtain. The initial cost of such trees is immaterial.
8. Young nursery trees should be handled as carefully as possible; they live in spite of transplanting, not because of it. Deep planting is highly injurious.

9. The young trees in the grove should be inspected every month, at which time any undesirable branches and any shoots arising below the main scaffold branches should be removed. No additional pruning is necessary.

10. Weeds and bush should not be allowed to interfere with the growth of the young trees. In a radius of six feet from the tree no bush should be allowed to reach more than two feet in height.

11. Bush mulching is recommended for an indefinite period of time. Should the natural growth in the grove prove insufficient it should be supplemented with grass and bush cut from adjacent lands.

12. The use of commercial fertilisers is not recommended except in cases where trees are in poor health and where the poor condition is not due to other factors than a deficiency in soil fertility.

13. The varieties recommended for planting are Marsh Seedless, Duncan and Walters.

14. The planting of selected varieties of oranges for the Barbados trade is recommended.

15. The commercial planting of papaws for the Barbados trade is recommended.

16. Careful handling of fruit carried out in such a way as to avoid mechanical injuries will reduce decay to a minimum.

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