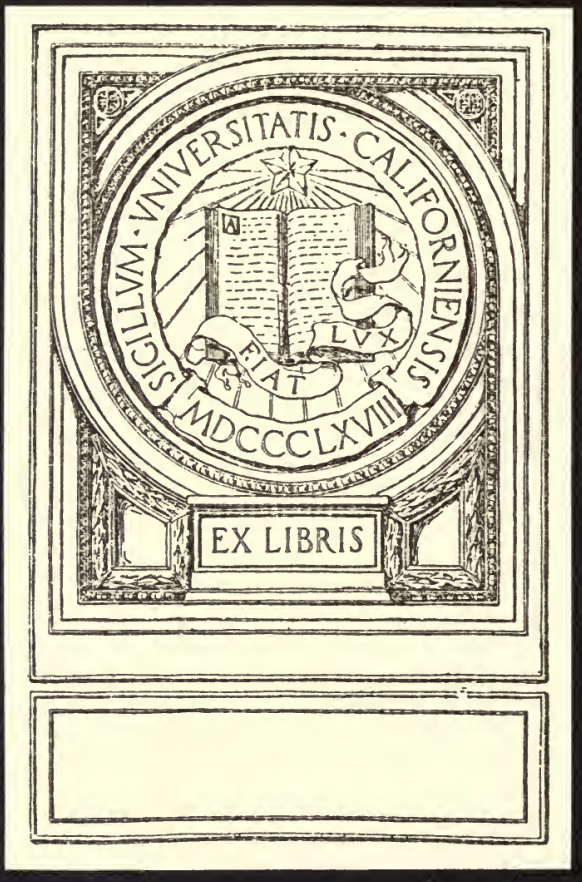
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QUEENSLAND.

DEPARTMENT OF AGRICULTURE AND STOCK.

The Custard Apple in QUEENSLAND.

With Notes on its History and Cultivation.

By

WILLIAM LESLIE

Assistant Instructor in Fruit Culture

UNIV. OF CALIFORNIA

Issued by the Authority of the Hon. W. N. GILLIES, Minister for Agriculture and Stock.

1922.

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UNIV. OF CALIFORNIA



TREE OF PINK'S MAMMOTH, GROWN BY JAMES COLLINS, REDLAND BAY.

The Custard Apple in Queensland

I. Introduction.

In order that the history of the cultivation of the Custard Apple in Queensland may be placed on record, it has been deemed advisable to collect all available information relating to the matter and to publish the results in pamphlet form.

The work has been carried out by Mr. Wm. Leslie, Assistant Instructor in Fruit Culture, who has gone fully into the matter and has received very valuable assistance in his investigations from many growers. The thanks of the Department of Agriculture and Stock are due to all those who have assisted Mr. Leslie in his endeavour to obtain reliable records, and particularly to the late Mr. Leslie Gordon Corrie, who was one of the first to recognise the value of this fruit and the suitability of Queensland for its production. Mr. Corrie not only recognised the value of the fruit, and recommended its cultivation commercially, but he made extensive plantings at his orchards at Redland Bay and Garden Island, where he tested many types and propagated those showing especial merit. Mr. James Collins, of Redland Bay, Mr. James Pink, of Wellington Point, Mr. William Soutter, of Sunnybank, Mr. Katterns, of Bowen Bridge, and others have also kindly supplied much valuable information which is incorporated in this pamphlet.

This pamphlet is primarily a compilation of records of the introduction and cultivation of the Custard Apple in Queensland, together with a description of some of the best types grown in this State; but, at the same time, it contains useful information respecting the soils and districts most suitable for the growth of this fruit, as well as advice regarding propagation, planting, pruning, cultivation, and manuring, that will be of assistance to growers, and particularly to those who purpose going in for the culture of this fruit.

There is no question regarding the suitability of Queensland for the production of high-class Custard Apples, or of finding a market for the fruit when grown, as, on account of its fine flavour, it meets with a good local demand, which is steadily improving. As the fruit becomes better known the demand for it is extending, and given better marketing facilities, the market for it in the Southern States is certain to improve.

With regard to varieties, there are several of proved merit and others are being tested. Of the former, that known as Pink's Mammoth is generally conceded to produce our finest fruit, as it is of large size, fine flavour, and contains comparatively few seeds. This variety is propagated mainly by grafting, and grafted trees are now producing fruit equal to that grown on the original tree still standing in the garden of Mr. Katterns at Bowen Bridge, and from which I obtained fruit, through the courtesy of Mr. James Pink, in 1897, when I was impressed with its size and quality, as it was certainly the best Custard Apple I had seen, and, although it is possible an equally good, or even better kind, will be produced, it still maintains its high reputation of being, perhaps, the best Custard Apple yet introduced.

ALBERT H. BENSON,

Director of Fruit Culture.

II. A few Notes on the Custard Apple.

By James Collins.

Redland Bay has been called by many, and rightly so, the home of the Custard Apple—no other fruit-growing district in the State having up to the present produced such quantities of Custard Apples as are sent every year to the Brisbane and Sydney markets. It may, perhaps, be safely said that Redland Bay produces more of this fruit than all other parts of the State put together.

It was in this district that the writer first saw fruiting trees of the Custard Apple, and had the pleasure of sampling their fruit. The trees were then growing in the garden now attached to the hotel at Redland Bay, which was at that time owned by Mr. William Dart, of sugar fame. Young trees from the seed of the above trees were planted by the writer, in a newly started orchard at Redland Bay, owned by the late D. J. Collins; this was about thirty-six years ago. Out of about twenty trees planted then, three trees turned out to be good croppers of fair quality fruit; the rest of the trees were duffers (unfruitful). Two, out of the above three trees, are still in a healthy and vigorous condition. Some seven years later, the fruit from the above trees was sent to the Brisbane market for sale, and it soon became evident from the demand, and the prices obtained, that Custard Apple growing would be a profitable undertaking. Among others who went in early for growing the Custard Apple in the district were Messrs. J. Moore, A. Strachan, the late H. Day, and the writer.

It soon became evident that seedling Custard Apples were not to be relied on, and, although the fruiting varieties then grown were not nearly so good as those now grown, grafting from the better varieties became the rule.

To Mr. John Williams, of Sunnybank, belongs the credit of grafting the first Custard Apple trees in Queensland; in fact, the trees that were first grafted by that gentleman were perhaps the first that had ever been done in any part of the world.

To the late Mr. L. G. Corrie belongs the credit of introducing to this district the two best varieties of Custard Apples now grown, viz.—the Island variety and the Giant or Mammoth, now known as Pink's Mammoth.

The Island variety is a strong grower, an early, regular, and persistent cropper of good quality fruit of medium size, weighing about 8 oz., although some fruits will turn the scales at from 1 to 2 lb. The fruit is uneven in shape, some are conical with a rough surface, while other fruits from the same tree are almost round in shape with a perfectly smooth skin. It is altogether a most desirable variety to plant.

The Mammoth comes from a seedling tree growing at Bowen Hills, Brisbane. It is a very vigorous grower, and, as a rule, does not commence to fruit until it has made a large tree, and is six or seven years old. Unlike the Island variety, it is not a regular cropper, the fruit is large, and some very large fruits weigh as much as 5 or 6 lb. It is very uneven in shape and appearance, but is of excellent quality and very free from seeds. To secure the best results from this variety, judicious pruning is needed, and it should not be forced into early growth during the spring—the later the trees are in starting their new growth, the more likely are they to have a good crop of fruit during the summer.

Much has been done by the writer in selecting likely looking seedlings, to produce something better than what is now grown (for the perfect Custard Apple is not yet), but he has not met with success yet. Perhaps no other fruit trees grown from seed produce so many worthless trees as does the Custard Apple; hence, a word of caution to intending planters—don't plant seedlings.

III. Anonas as relating to Queensland.

By William Soutter.

Away back in 1874 appears the first public allusion to these plants. Mr. Walter Hill, the then Director of the Botanic Gardens in Brisbane, issued the first catalogue of plants growing in the Brisbane Botanic Gardens, prior and up to 1874. At page 90, a list of the Anonas is given, as follows:—*A. cherimolia* (Cherimoya), *A. muricata* (Sour Sop), *A. palustris* (alligator apple), *A. reticulata* (netted Custard Apple), *A. squamosa* (Sweet Sop). It is reasonable to assume that all the Anonas then growing were seedlings raised from imported seed of the species mentioned. Some time away in the sixties the late Mr. L. A. Bernays, C.M.G., evidently imported seed of anonas; as a very old tree of *A. reticulata* was growing in what was known as the Economic Ground at Bowen Park in 1885. The late Alexander McPherson was the first overseer of the Acclimatisation Society, under the supervision of Mr. Bernays. Mr. McPherson told me that this plant was a seedling raised by Mr. Bernays. Mr. McPherson prepared the place for the young tree, and planted it along with several other seedlings of various trees that were planted at the same time, one being The Rose Apple (*Eugenia jambos*), and another The Brazilian Cherry (*Eugenia uniflora*). The Anona and Eugenias were destroyed when the land on which they were growing was resumed by the National Association for show purposes. From 1874 till 1884-5, nothing is heard of the Anonas that calls for notice, but about this latter date Mr. Wm. Pagan, then Engineer for Railways, who had recently arrived in Queensland from South America, in conversation with Mr. James Pink, who about that time was overseer of the Acclimatisation Gardens, told Mr. Pink that a Custard Apple grew in South America that bore fruit as large as a child's head, and of excellent flavour. Mr. Pink immediately wrote to Mr. Jenman, then



ORIGINAL TREE OF PINK'S MAMMOTH, GROWN BY G. D. KATTERNS, BOWEN BRIDGE.

Director of the Botanic Gardens, Georgetown, British Guiana, and in due course four seeds arrived. These were planted, but only three germinated. One plant was placed in the old Economic Ground at Bowen Park, another was planted by Mr. Katterns in his garden in Sneyd street, Bowen Hills, the plant being given to him by Mr. Pink, and the third plant was placed in the Botanic Gardens on the flat just a little distance below where the existing bandstand is erected. The plant at Bowen Park never made much headway, and it finally perished. The plant in the Botanic Gardens grew, but never, so far as I know, bore fruit. It was destroyed in the 1893 flood along with many other plants that were submerged. Mr. Katterns' tree, therefore, became the sole survivor, and in this year of grace 1922 is still growing vigorously.

About the middle of the eighties the late Mr. Leslie Gordon Corrie was actively on the lookout for all sorts of novelties in the way of fruit trees. On one of his visits to me I showed him a fruit gathered from Mr. Katterns' tree. He got quite enthusiastic over it, and I forthwith took him to see the tree growing, and told him how it originated and how a few of us enthusiasts were keeping it under observation. On arrival at Mr. Katterns' that gentleman told Mr. Corrie the story of its origin, and in a letter to me from Mr. Corrie, dated 8th January, 1917, he repeats the whole of the interview that took place with Mr. Katterns on his first introduction to the tree, and invites my criticism as to its accuracy—

[*Extract from letter.*]

"18 Parbury House, Eagle street, Brisbane, 8th January, 1917.

"Dear Mr. Soutter,—A good many years ago—somewhere in the neighbourhood of twenty years, it may be more—when I was keenly on the hunt for Custard Apples, you showed me some fruit at Bowen Park one day, and said it came from a tree growing quite close, and you took me right away to see it at the back of Mr. Katterns' cottage off O'Connell terrace. That was my first sight of the tree. When I was admiring its stem and growth Mr. Katterns said it never gave trouble, but grew well from the day he planted it, when it was less than the thickness of his little finger. He gave me some fruit, and promised me cuttings later on, which he duly gave me, and from these my trees were worked. This is how I got this variety. Mr. Katterns also related, as you will no doubt remember, how he got the tree. He said some work was going on near the road on the society's boundary, and Mr. Pink, who was then with the society, came over to the fence with the tree in his hand, and gave it him, saying it was a good Custard Apple.

"I raised the point, and somewhat of a discussion ensued, as to whether it might not have been a worked tree, but Katterns said this was not so, that it was just a straight stem like a whip, showing no sign of ever having been worked, or cut, or pruned, and that he took and planted it where it was now growing, and no one had ever interfered with it. You also contended it was quite unlikely to have been worked; and, indeed, I am myself certain it was a seedling.

"The foregoing is my clear remembrance of the matter. I was uncommonly interested, because of the unusual interest of this variety and its good growth. Doubtless you will remember the circumstances as I do. If I am wrong in any particular according to your remembrance, will you please advise me? "(Signed) LESLIE GORDON CORRIE."

The foregoing extract from Mr. Corrie's letter is substantially correct. In 1889, at a meeting of the Fruitgrowers' Association, held in Brisbane, the merits of this seedling Custard Apple were discussed, and it was resolved that it be named Pink's Mammoth, after the raiser, Mr. James Pink.

It was not till 1887 that Mr. John Williams worked the first plants for Mr. Corrie on Garden Island (Tindappa). The first plants worked in Queensland were for Mr. Moore at Redland Bay, cleft grafting being adopted; Mr. John Williams operated. In 1889, Mr. Williams worked several hundreds of plants at South Park, Redland Bay, for Mr. Corrie, but quite a number of the buds or grafts did not take, owing to exposure to high winds. This accounts for the fruit variations found in this grove, as quite a number of the trees are the seedling stocks, chiefly seedlings of the original tree.

The following are a few notable Anona trees in Queensland that I have known, which must have been planted in very early times, but their early history lies beyond my advent to the State. A very notable tree of either *A. squamosa* or *A. sericea* was growing at Bowen, the one time residence of the late Eugen Fitzalan, one of Bowen's earliest settlers. He informed me that he got the plant from Mr. Hill, of the Botanic Gardens, about the latter end of the sixties. Mr. Fitzalan was an enthusiastic botanist, naturalist, and gardener. This Anona, in 1887, was about 30 ft. high, with a stem measurement at 2 ft. above the ground of 4 ft. 10 in. in girth. It bore enormous crops annually, and practically carried fruit for nine months in the year.

Another notable Anona grew at Mon Repos, the then residence of Augustus P. Barton, near Bundaberg. This was seemingly *A. reticulata* (the netted Custard Apple). The writer saw it in the middle eighties. The fruits were large, of fine form, and fair flavour. The flesh was a very pale pink. The seeds were numerous, but all attempts to germinate them were futile. Mr. F. L. Nott, Windermere, and Mr. Farquhar, of The Hummock, tried their best and failed. I tried about a couple of hundred with similar result. Mr. J. E. Noakes, of Maryborough, succeeded in raising one plant out of several hundreds of seed, and about twenty years ago it was growing in his garden. Mr. Barton told me that he brought the original plant from Java.

A somewhat notable plant of Anona grew for many years behind the original cottage that stood in the Brisbane Botanic Gardens. I have not seen it for ten or more years. It had the peculiarity of producing a fascicular branch which resembled a bunch of mistletoe. This tree and

its peculiarity was first pointed out to me by Mr. Walter Hill. He, however, never ventured to define its species to me. I am, however, inclined to the opinion that the plant was a seed variation of *A. reticulata*, as the structure of the foliage inclined to that species.

At various times during my term of connection with the Acclimatisation Society importations of seed of Anona were made, the following having all been imported:—*Anona sylvatica*, a native of Brazil, known there as Araticu do mato. Several plants were raised, but I have no record of any having reached the fruiting stage. Another importation was seen of *A. laurifolia*, which turned out to be *Eupomatia laurina*, a closely related species of the same genus. *A. sericea* and *A. furfuracea* were also introduced; and, although plants were raised and distributed of these Anonas, no records are available as to their growth. The late Mr. L. G. Corrie had plants of these placed on Garden Island, in Moreton Bay, they being planted by myself, I think, in 1892. Another Anona introduced was *A. montana*. This was sent from the gardens at Hackgalla, Ceylon, by Mr. Nock, the director. Out of the few seed sent about a dozen plants were raised. Mr. Corrie received three; two were planted on Garden Island; and another at South Park, Redland. One was planted at Bowen Park, which fruited about the middle nineties, but was regarded as possessing no merits to warrant its preservation. Like *A. palustris*, *A. montana* proved to be a very soft-wooded species that could not prosper and withstand the low temperatures of our Southern Queensland winters. These foregoing remarks, I venture to think, cover the history of Anonas as regards their association with Queensland. Although it must be borne in mind that thousands of seedlings have been distributed to many parts of the State, especially along the coastal lands, quite a number were also sent to Thursday Island and New Guinea. The late Hon. John Douglas, who was keenly interested in all plants of economic value, had several lots of Anonas sent him by the writer, as also had the Rev. Bishop Verges, who controlled the Mission of the Sacred Heart (R.C.) in the Papuan Gulf and New Guinea. To follow up the subsequent history of all these plants is beyond the scope of my efforts, but, no doubt, there are many Anonas growing in Queensland between Point Danger in the South and Cape Somerset in the North, and even in New Guinea, as the result of the distributions alluded to. Under normal and natural conditions all the species of Anonas might reasonably be expected to reproduce themselves from seed, true to type; but under agglomerative conditions, with diversified environment of climate, soil, and situation, and a distinctly different class of pollen-distributing insects, we may safely come to the conclusion that partial cross-pollenation must ensue, and seed variations will be manifest. We have not far to look for a marked example in the mango, as from *Mangifera indica*, *M. fœtida*, and *M. sylvatica*, introduced about sixty-five years ago, we possess to-day thousands of seed variations, which are annually being added to.

October, 1918. WILLIAM SOUTTER.

IV. Propagation and Grafting.

Custard Apples were at first propagated by seeds. After the discovery of the Mammoth variety grafting was commonly resorted to, to ensure the holding of its superb qualities. The Custard Apple is notoriously given to variation when raised from seed, which character probably arises from the habit of the male and female organs on one tree developing at different periods, and so causing the flowers of one tree to be pollinated from those of another tree. This is probably one cause of isolated trees flowering freely, but producing no fruit.

A Custard Apple orchard should always be formed of worked trees. If the grower does his own grafting, a few seedling trees may be grown from which seeds for stocks may be obtained, but the grower's rule should be to plant only worked trees of certain varieties.

At first it may be necessary to buy trees from a nurseryman, but it is desirable to have a small nursery on the plantation, so that young trees may be available at any time for extending the plantation or supplying extras.

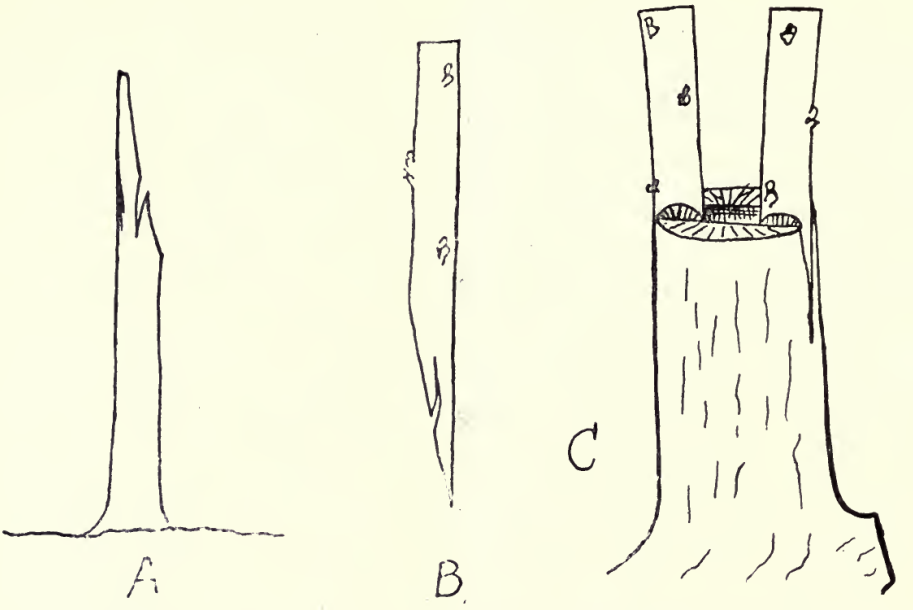
Though budding is practised in the propagation of the Custard Apple in California, Florida, and the Philippines, the system generally adopted in Queensland is grafting. In Madeira and the Canary Islands desirable varieties are also propagated by grafting, and Dr. Trabut in the "Bulletin Agricole de l'Algerie et de la Tunisie," in the course of a discussion on Custard Apple propagation, says that grafting has been found much more successful than budding.

The stocks used should be two years old seedlings of the Cherimoya type, such as the Island (Plate 1), or the Alligator Apple (*A. glabra*). In Florida and the Philippines the Sweet Sop or Sugar Apple is used as a stock, but a prominent Brisbane nurseryman says it is unsatisfactory. *A. montana* (Plate 13), and what Redland Bay growers call the Mount Cotton variety are also said to be good stocks. Probably the reason why tropical species like *Anona squamosa* and *A. muricata* are unsuitable as stocks in Southern Queensland is that they are out of their usual climate; they require more heat and moisture.

Provided good stocks are available of about the thickness of a common pencil or up to half an inch, the grafting may be proceeded with. The materials requisite for the work are a good sharp knife and tying or bandaging material; a strong budding knife will be found the best tool. Nurserymen generally use raffia for tying, but budding or grafting tape is more serviceable, quicker, and affords less chance of admitting dirt into the wound.

The best form of grafting on nursery seedlings is the tongue or splice graft. Well-matured wood of the previous season's growth should be obtained for scions, which should hold at least three good buds on the section to be used. Reference to figure will show how the cuts should be made, the stock being cut as at A and the scion as at B. The

tongue of the scion should be fitted into the tongue of the stock so that the inner bark of both stock and scion meets as nearly as possible all round. It is just under the bark that the union of the two parts takes place. The parts should then be firmly bound together with the tape or



other tying material. In event of the union being made within 6 in. of the soil, this may be heaped up round the graft to keep the parts cool and moist. But it may sometimes be found advisable to put on a graft higher up or on an old stock. If the stock is old, or of a greater diameter than half an inch at the point of insertion, other kinds of grafts may be found more suitable. The stock if thick may be cut across with a saw. It may then be cleft with a strong knife and mallet and one or two scions may be cut with wedge-shaped points and one put in at each side of the cleft so that the bark area of both scions meets with the bark area of the stock at each side of the cleft, see Fig. C. The union should then be entirely covered with the waxed tape and the whole made airtight. To further maintain coolness and moisture round the parts, a piece of bagging may be lightly tied over the whole.

Grafting should be done when the sap is moving freely, and this period generally occurs in the case of the Custard Apple between the middle of September and the middle of October.

"All tools used in grafting should be kept in good order, knives especially so, as it is difficult to cut a good-fitting graft with a blunt knife, and not only that, but the cleaner and neater the cut the more certain and perfect the union. All tools used for grafting should be kept perfectly clean, and should be sterilised frequently by immersion in a 5 per cent. solution of formalin.

"Grafting-wax, which may be used for all grafts above ground, is



PLATE 1.—ANONA CHERIMOLIA. ISLAND VARIETY.



PLATE 2.—ISLAND x STRACHAN'S NO. 1.

made in several ways. One recipe consists of melting together, over a slow fire, equal parts of beeswax, resin, and tallow till dissolved and thoroughly mixed, when it is ready to apply, and another good wax is made as follows. Take of—

Beeswax	1 lb.
Tallow	½ lb.
Resin	1 lb.
Turpentine	2 oz.

"Melt the resin and tallow over a slow fire; then add the wax, and when melted mix well together. Then add the turpentine and stir well, when it is ready for use.

"Grafting-wax may be applied hot with a brush to the graft when tied in position, care being taken to cover the wound carefully so as to exclude the air. A simple and convenient way of using the wax in the case of nursery stocks is to dip a sheet of thin calico into the boiling wax and, when cold, tear the waxed calico into narrow strips of suitable length. The graft being placed in position, the waxed tie is wound round it so as to completely cover the union; the heat of the hand being sufficient to soften the wax, so that it sticks well and is airtight.

"The principle of every method of grafting, whereby the scion or graft is made to unite with the stock, is the bringing together of the cambium layer of each, as this cambium layer is the growing or wood-producing portion of the stock and scion; and when the two layers are brought together and kept together without air, they each throw out new cells which join together and form one layer of wood." (A. H. Benson.)

V. Cultivation.

CLIMATE.

The Custard Apple (*A. cherimolia*) is native of the mountains of tropical America up to 4,000 ft., where the climate at that altitude would be subtropical, very much the same as that of the Redlands area of Southern Queensland. This is probably the reason why the Island and Mammoth varieties have done so well in this district (see Mr. Collins's notes, page 7).

Rainfall records from the native habitats of these species are not available, but it is evident that a rainfall of 40 to 50 in. per annum, the mean of the Redlands area of Queensland, is suitable. Years in which the mean has been exceeded or wherein the fall has been greatest about the time of fruit-setting, have proved the most prolific in the Redlands, and when drought conditions have accompanied this period, or have prevailed throughout the season, a resultant diminution of crops has been noted. Irrigation at the flowering and fruit-setting period would be beneficial in a dry season.

SOIL.

The Custard Apple tree appears to thrive in a variety of soils, but does best in deep friable loam and in rich chocolate soils like that found at Redland Bay. On the scrub and forest lands in south-eastern Queensland, on the higher lands of the North Coast area, within the tropics (the elevation should increase in accordance with proximity to the equator), provided the rainfall was suitable this tree would thrive. Purely tropical conditions, however, do not appear to be conducive to the production of first-class fruit of the Island and Mammoth types, though the Sour Sop and Sugar Apple thrive best under such conditions. After felling the scrub and burning off, bananas may be planted at 15 ft. by 15 ft. in September or October, and the Custard trees may be planted at the same time in alternate rows midway between alternate pairs of bananas, so as to have the trees 30 ft. apart in the banana row, but being planted diagonally they would be about 33 ft. in the other direction. After about three years, the two banana stools on each side of the trees should be cut out to give the trees sufficient space, and at the end of about another three years, the whole of the bananas should be rooted out, chopped in pieces to dry, and then ploughed into the soil, so that the trees would then be in full occupation of the area. In forest lands, after clearing and stumping, the soil should be worked to a depth of about 18 in. and all roots extracted. Two ploughs should be used, first an ordinary one to open up a furrow about 9 in. deep, wherein a sprinkling of bone meal or screenings should be put, then a subsoil plough should follow and stir in the bones at the bottom of each furrow, the whole area being thus worked over and manured to a good depth. After harrowing and getting the soil thoroughly pulverised the trees may be planted. The ground should be staked out diagonally in lines so that the trees will be 30 ft. apart in the case of the Mammoth and 25 ft. apart in the case of the Island and Kedron varieties, which are not quite such luxuriant growers. Small crops may be grown between the trees up to within 4 ft. of their stems for the first year, and 3 ft. further for each subsequent year, so that at about the fifth year the Custard Apple trees shall have the whole area to themselves. One row of bananas might be grown between the trees for the first four or five years if the soil is suitable, but in all cases of intercropping of this kind on forest soils liberal manuring must be resorted to, so that the soil will not be impoverished by any temporary crop at the expense of the permanent trees.

PLANTING.

The planting should be done in August or September. Care should be taken not to plant trees too deep. A tendency has been noted amongst planters to make an error here, in the desire to have the trees well anchored in the soil or to have the graft covered. The graft should not be covered, and the tree should not be planted an inch deeper than it was when growing in the nursery. A number of instances of young trees having died suddenly can be traced to trees having been too deeply

planted. The bark is softened, any bruises that the stem may have received in transplanting give rise to rot, and sometimes the rot starts at the graft where that is under the surface of the soil, whereas bruises heal more readily if above ground and exposed to light and air, the bark remains hard and healthy, and there is generally no tendency to rot from the graft. A hole should be dug of a size suitable to the roots of the young tree. The soil should be well pulverised, and the roots should be gradually and firmly covered by it. In dry weather, before completely filling the hole, a bucket of water should be poured round the tree, and after it has soaked down to the roots the remainder of the soil may be levelled over.

A stout stake should be driven in alongside the newly-planted tree, to which it should then be tied.

LATER CULTIVATION

will consist in keeping down weeds, and after the first six years the soil should receive a dressing of manure. This should be ploughed in during the winter months at the end of the seventh year after planting. The plough should not go nearer the tree than about the spread of the branches. After about another three years' interval another similar dressing should be given. If the soil is poor, manure may be required every year in order to yield satisfactory crops. If the soil is rich, or manured with meatworks or other nitrogenous fertilisers previous to planting, there is a likelihood of the trees throwing too many strong sappy growths, and they are not likely to fruit so well. No manure should be given except the original deep ploughing-in of bones in subsoiling until the trees throw their first crop of fruit. Manuring will depend largely on the nature of the soil. To keep down weeds and maintain the soil moisture, the scarifier with side sweeps may be run over the soil to stir it to a depth of 2 in. or 3 in.

PRUNING.

Pruning demands careful attention. For the first four or five years the grower should aim at getting a tree of a good shape and having the branches well distributed. The Mammoth is naturally a straggly tree, and pruning will be required to correct this habit of growth. As regards the general appearance of a well-pruned tree, reference should be made to frontispiece, showing a model-shaped tree as grown by James Collins at Redland Bay. In the first two or three years, in the month of September, or when the leaves show signs of dropping, all long sappy growths should be trimmed, except where they should be cut right out—*i.e.*, where they are in the wrong position—running through centre of tree. They should never be cut hard back, but about half the shoot should remain and the lateral-growing branches should be encouraged. In some instances—*i.e.*, with shoots about 3 ft. long—1 ft. should be cut off the point, cutting back to near a bud which is likely to produce a branch in a desirable position. An open centre should be aimed at in a tree at this age. Later, as the tree gets older, a canopy of branches



PLATE 4.—STRACHAN'S NO. 1.

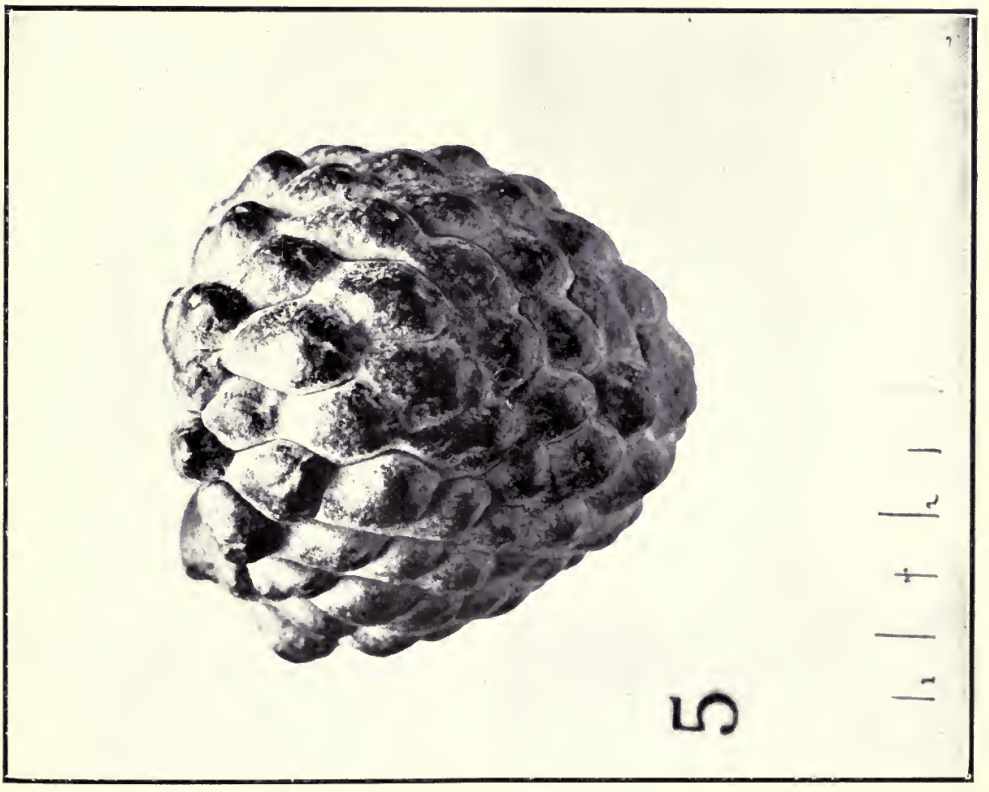


PLATE 5.—STRACHAN'S NO. 2.

should be allowed to grow over the hollow centre. No crossing or rubbing of branches should be permitted, and they should be thinned so as to admit a maximum of light and air to as many leaves and branches as possible. This principle in pruning holds good with nearly all trees. With regard to pruning the Mammoth, the statement of James Collins should be noted—viz., that they should not be early pruned, as this would cause them to shoot too early. If the trees are pruned early, and especially if they are cut too hard back, many long sappy growths may be produced, and there will be little or no good fruiting wood. Fruit is often borne on the small or medium-sized lateral branches when well ripened. Trees should be furnished with branches to within about 2 ft. from the ground, or at such distance as, even when holding fruit, they will not touch the soil. Branches or leaves touching the soil form a means of access to the trees for insects which live for a certain period in the soil.

PICKING AND PACKING.

The fruit should be gathered just after it is full grown, as shown by the lighter colour of skin between the protuberances. It should be handled with care—the more carefully the fruit is handled the better appearance it will have when opened up in the market, and the higher will be its value. Some practice will be required by a novice before he becomes sure as to when the fruit is ready for picking. If allowed to ripen on the tree the fruit will not be fit for packing for market. After picking, the fruit should be carefully graded and firmly packed in trays or cases.

During the first six years the returns from small crops should pay working expenses. In the sixth year and onwards the Custard Apple trees should yield an increasing return, so that in ten or twelve years the initial cost may be entirely paid off.

SPRAYING, Etc.

The Custard Apple tree has had a reputation for immunity from pests and diseases, but within recent years a few have been noticed, and it is likely that by bringing them under notice now their spread may be hindered if growers adopt measures of control. In this connection the following practical suggestions may be found helpful.

The laws of plant sanitation should be carried out as rigidly with Custard Apples as with other orchard fruits:—

1. Implements and materials used in grafting should be perfectly clean and sterilised, and no dirt or foreign matter should be admitted to graft wounds;

2. Care should be taken, especially when planting young trees, that the bark near the ground line is not bruised or broken;

3. All prunings or dead wood should be carried off the ground and burnt;

4. No ragged wounds should be left in pruning;



PLATE 3.—ANCONA SQUAMOSA—SWEET SOP.

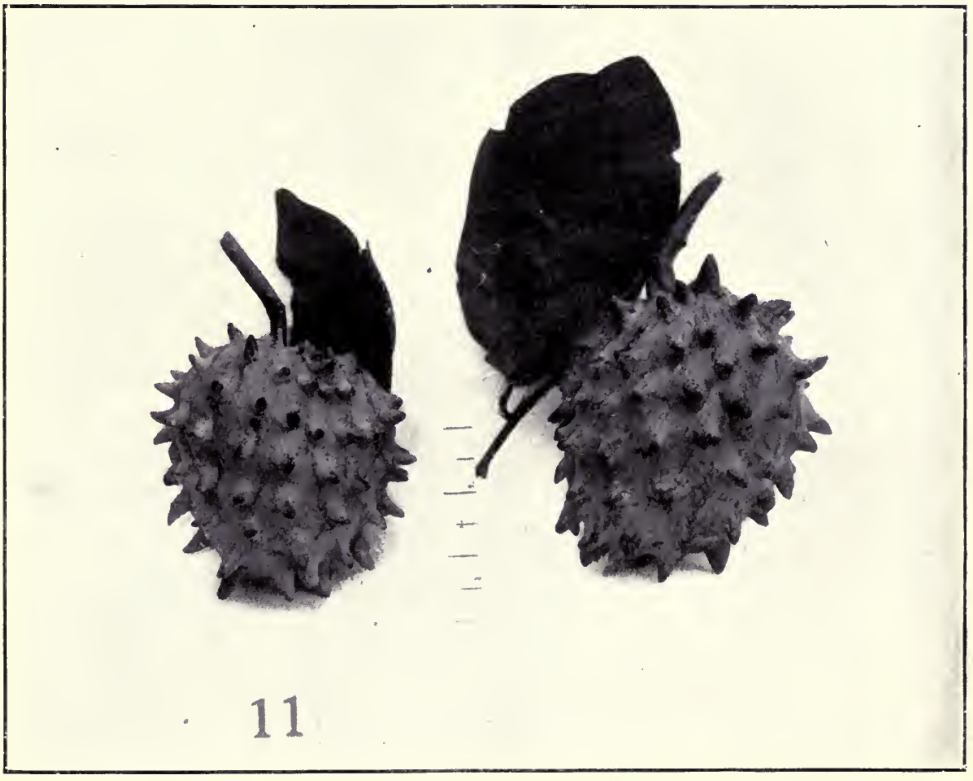


PLATE 11.—PRICKLY, OR MOUNT COTTON VARIETY.

5. All wounds, especially the larger ones made in pruning, should be brushed over with Stockholm tar;

6. No fruit should be allowed to lie on the ground;

7. Grub-infested fruit should be collected and destroyed by boiling or burning.

Fruit-fly seldom attacks Custard Apples, but grub-infested fruits have been found—*i.e.*, those which have been bruised or had fallen and burst. The larvæ of the maize moth have also been found in the fruit. They generally enter where the skin is soft—*i.e.*, where two fruits touch or where a fruit touches a branch.

Towards the end of September in each year trees of the Island and Mammoth varieties lose their leaves in a varying degree, and they may be almost leafless for several weeks. This period is the time for pruning and spraying. If the trees are infested with scale and smut, they should, after pruning, be thoroughly sprayed with lime and sulphur or kerosene emulsion. If a few old leaves remain after pruning, and they are infested, it is better to pull them off and destroy them with other infested material. Insecticides applied at this period check the growth and development of pests more successfully than at any other time, and the spraying solutions will reach all parts more thoroughly.

In seasons when the fruit becomes infested with mealy bug it amy be found helpful to give the trees another spraying when the first crop of fruit is about half-grown. Kerosene or kerosene-carbolic emulsions are generally preferred for combating mealy bug. The natural enemies of this pest generally reduce its numbers considerably, but in some seasons it becomes quite abundant and renders much of the fruit unsightly; additional work is also laid on the grower, who has to brush or wash the fruit before packing it. A third spraying, aiming chiefly at the fruit, might be necessary when the fruit is nearly full grown. The first spraying with a strong solution or emulsion when the trees have just been pruned and are leafless will be found useful for this as for many other pests.

Kerosene Emulsion.

Kerosene, 2 gallons;
Soap (whale-oil or soft soap), ½lb.;
Water, 1 gallon.

Boil the water and in it dissolve the soap, then add the kerosene. Whilst still hot churn thoroughly with a pump till a thick emulsion is obtained and no free oil. For spraying use one part of this emulsion to twelve parts of water.

Carbolic Acid Emulsion.

Crude carbolic acid, 1 gallon;
Whale-oil soap, 8 lb.;
Water, 8 gallons.

Dissolve the soap by boiling in the water, then add the carbolic acid. For spraying add 20 gallons of water to every gallon of the emulsion.

FIELD NOTES AND RECOMMENDATIONS, &c.

Custard Apple Diseases.

Director of Fruit Culture.

Sir,—I have previously reported on the occurrence of diseases on Custard Apple trees, and, in view of the increasing area now being devoted to this excellent fruit, I wish to record some recent observations.

Certain young custard trees on the property of L. G. Corrie at Garden Island were found in a dying state, and specimens of them were obtained for head office investigation, so as to determine the cause of the disease.

My inspection of affected trees in various places leads me to believe there are two distinct causes for the sickness or death of these trees and each is characterised by a series of symptoms.

Collar Rot of Custards.

I give it this name to distinguish it from the collar rot of oranges and lemons.

The symptoms of this disease appear as follows:—

1. The leaves near the base of the branches turn yellow abnormally, whilst the remainder of the trees looks vigorous and healthy.

2. Within about three days after this is first noticed all the leaves on the tree suddenly dry up and generally drop off.

3. The leafless branches dry up from the tip downwards.

Unless the tree is treated at the very first appearance of yellowing, death will ensue within a few days.

Die-back of Custards.

1. The leaves generally of the weaker or smaller shoots turn brown at the edges.

2. The shoots become stunted in their growth and die back from the tips.

3. The foregoing symptoms appear sometimes on only a few branches, and the tree may live a long time in a weak state.

In view of the fatal character of the collar rot, preventive measures have been recommended in accordance with certain conditions which have been noted as likely to introduce or encourage the disease.

(*a*) It has been observed that the disease causes the rotting of the bark of the stock and stops when it reaches the scion, and it is possible that certain species of Anona are more liable to the disease than others, and should therefore be avoided as stocks.

(*b*) It seems likely that the disease may gain an entrance at the graft wound, germinating in the exposed cambium and growing downwards into the roots and around the stem. It is therefore important to



PLATE 7.—KEDRON.

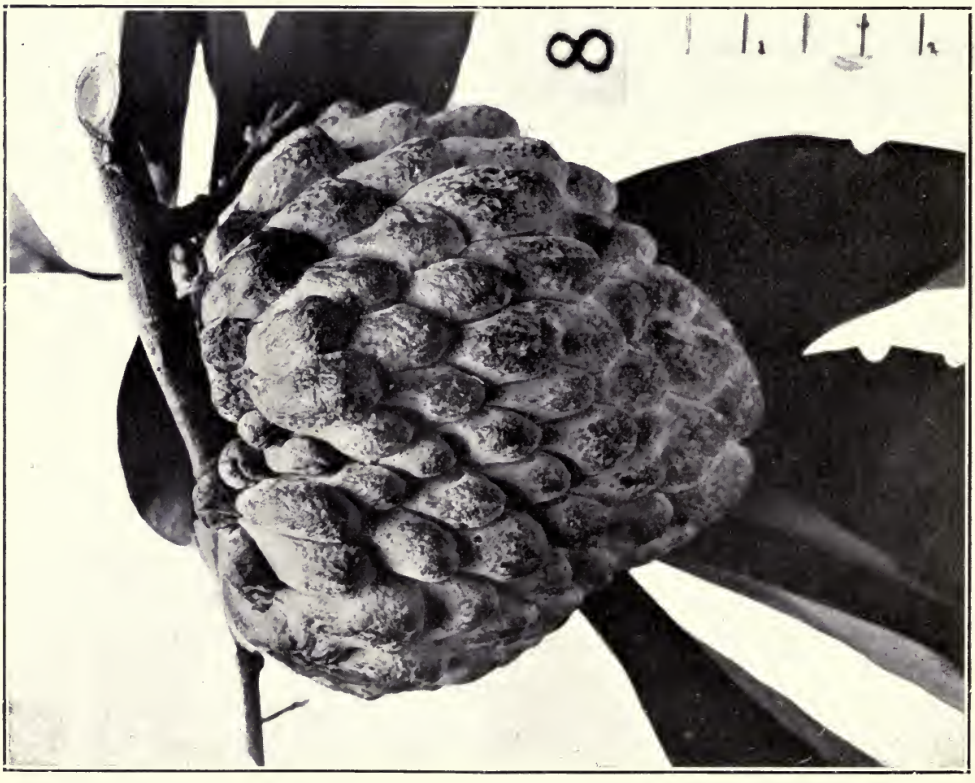


PLATE 8.—BUNKER'S No. 1.

have clean or sterilised grafting tools and the graft should be well covered to exclude air or foreign matter. Wax containing an antiseptic might be used.

(*c*) I find that diseased trees have generally been planted too deep. Instead of staking the trees after planting they are planted deep enough to enable the tree to stand in the wind without staking. The burying of the stem in this way will tend towards softening the bark (the piling of earth or rubbish round the neck of a tree will have a similar tendency) and will almost certainly encourage this disease, and planters should be careful not to plant deeper than the tree was when it was in the nursery, and stakes should be used for support of the young tree.

(*d*) At planting time also the bark of the tree may be bruised by careless handling and the disease may begin at such a bruise.

If the disease is noticed in time the following measures are commendable:—

(1) The excision of all diseased bark, and if even a small area of healthy bark remains to connect root and branch the tree may often be saved.

(2) Painting the wound immediately after with an antiseptic or fungicide—Stockholm tar or Bordeaux mixture.

The die-back seems mostly to affect the feeding roots and the following measures may be tried:—

1. Trim off or shorten all weak or decaying branches.
2. All prunings and dead wood lying about the orchard should be burned.
3. Apply a stimulant, in the form of a top-dressing of good stable manure, and if the weather is dry soak the soil with water or weak liquid manure.

WM. LESLIE, Inspector P.D.A.

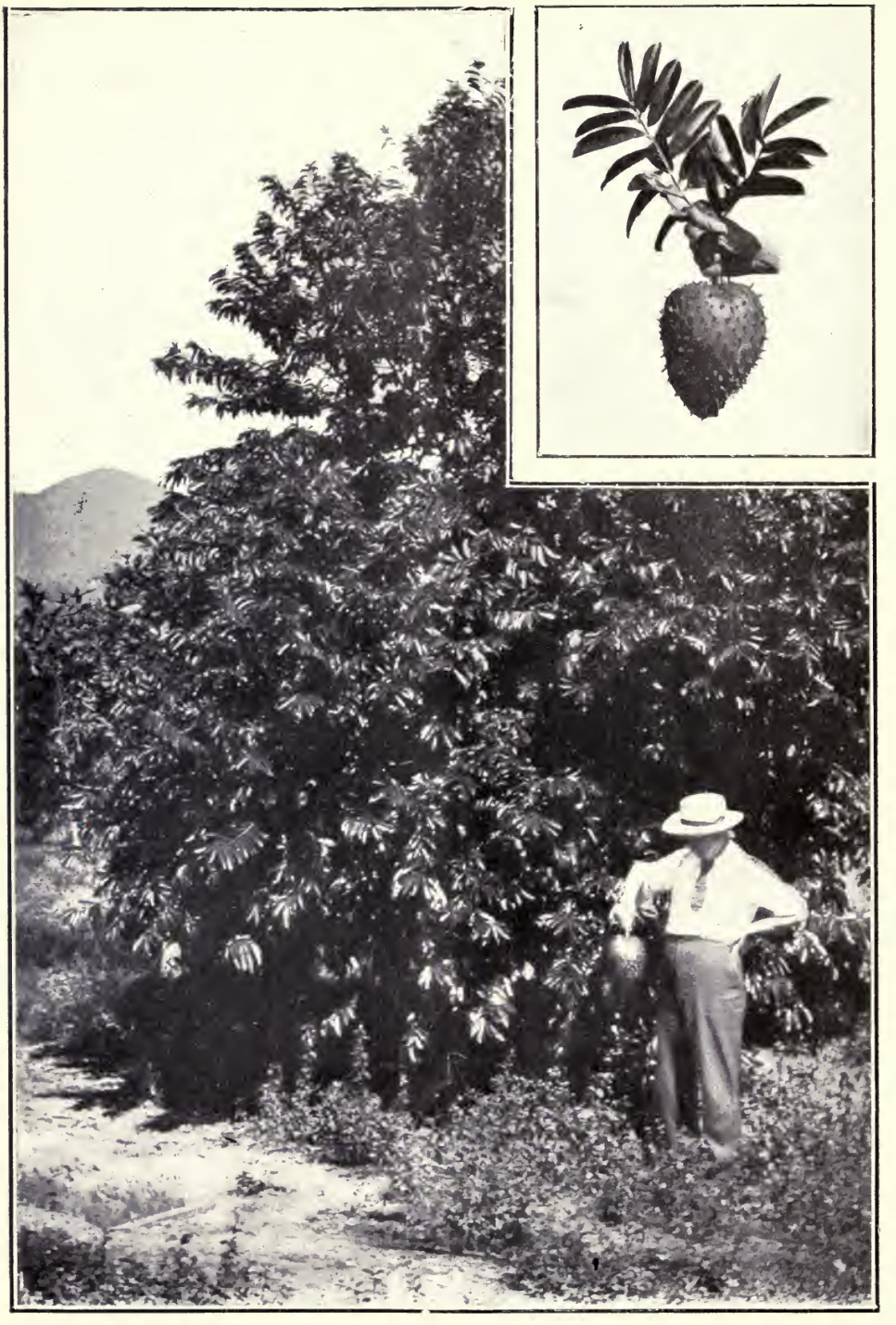
15th April, 1918.

VI. Notes on Species and Varieties.

Seeds* of Custard Apples have been imported into Queensland from time to time, some through the Botanic Gardens, Brisbane, and others through the Queensland Acclimatisation Society, and both trees and seeds have been distributed by each of these centres to growers throughout the State. This stands proved by the existence of trees of a number of species of Anona which have been discovered in the course of recent investigation.

Two of the oldest trees in the State used to grow in the grounds

*It is also likely that *plants* of several species of Anona would be obtained in wardian cases from the Royal Gardens, Kew—especially in the period when Walter Hill was Director of the Brisbane Botanic Gardens, 1868 to 1880.



TREE AND FRUIT OF ANONA MURICATA L.—SOURSOP. Grown in the Mossman District, Queensland.



PLATE 9.—NEAR PINK'S MAMMOTH.

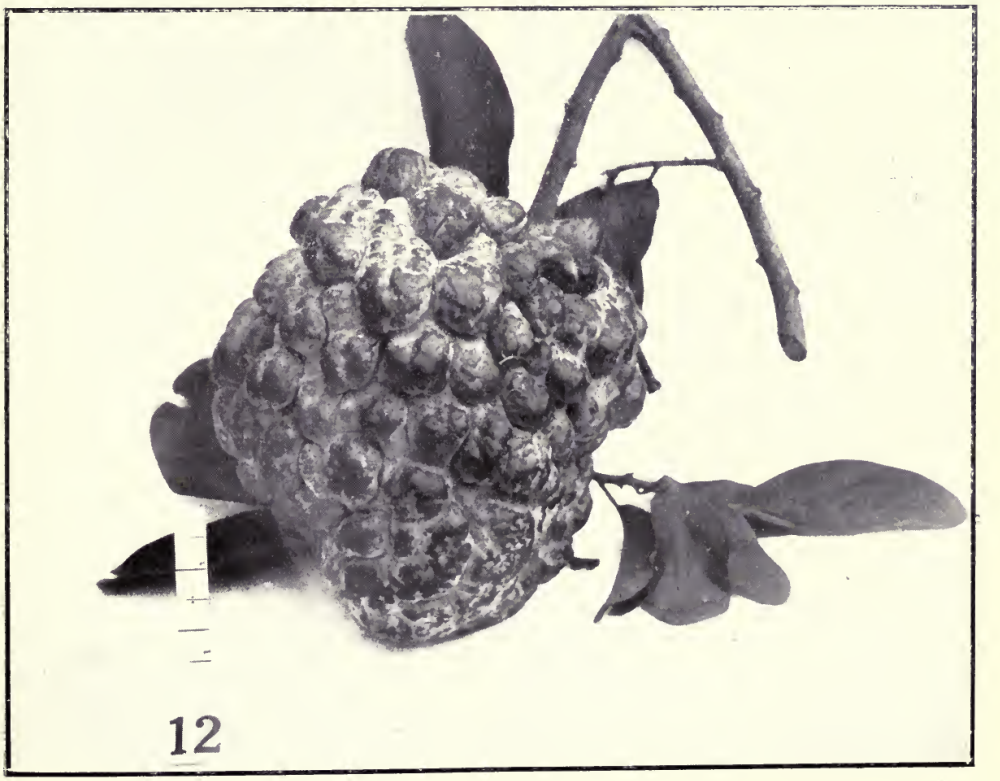


PLATE 12.—PINK'S MAMMOTH (OUTRIDGE.)

of the Redland Bay Hotel. The remains of one, consisting of a few fresh branches, are still to be seen there. Mr. James Collins states that they produced good fruit and that he obtained seeds from the better one and he has now growing in his orchard the progeny of that old tree. Plate 22 shows a fruit from one of these trees. A fruit from another old tree growing in the orchard of Mr. William Moore, of Redland Bay, was obtained and is described on the list (No. 17). This tree had borne some fair-sized fruits, but the flavour was poor. The age of the above-mentioned old trees is estimated at over fifty years. The following notes *re* old trees and introductions were given by Mr. J. F. Bailey, Director of Brisbane Botanic Gardens, in 1910.

"*Anona muricata* and *A. cherimolia*.—Growing in Captain Wickham's garden in 1856 and at Brisbane Botanic Gardens in 1861. The lastmentioned fruited at the Gardens for the first time in 1867.

"*A. reticulata*.—Growing at Bowen Park in 1866. Thirty-four Custard Apples were distributed from the Brisbane Botanic Gardens in 1862, but the species are not recorded. Five hundred and fifty-seven bushels of Custard Apples were produced from 13 acres in 1908.

"*Anona squamosa*.—Plants were sent to M. C. O'Connell, Port Curtis, and to a gardener in Brisbane in 1854 from the Sydney Botanic Gardens. Growing in Captain Wickham's garden at Newstead in 1856 and in the Brisbane Botanic Gardens in 1861."

There is a record in the report of the Acclimatisation Society for 1885 of *Anona palustris* (Syn. *A. glabra* L.) the alligator apple, having fruited in the society's gardens in that year. The Custard Apple appears to have been little noticed in Queensland until the late Mr. L. G. Corrie brought into prominence a very fine variety (Pink's Mammoth) found in a private garden near Brisbane. The years 1879 to 1885 hold the most important period in the history of the Custard Apple in Queensland. About the former date, Mr. James Pink, who was then manager for the Acclimatisation Society, heard "Custard Apples as big as loaves" spoken of by Mr. W. Pagan as having been seen in South America.

Mr. Pink sent to the Director of the Botanic Gardens (G. S. Jenman, F.L.S.), British Guiana, for seeds. He ultimately obtained a few, from which he raised four plants. One of these plants was given to Mr. G. D. Katterns, of Bowen Hills, and the others were lost. Mr. Katterns took care of the tree and it grew well. Its first fruit was sent to Mr. Pink, who was then at the Botanic Gardens, and he obtained scions and sent some to Mr. James Collins, of Redland Bay.

Meanwhile the late Mr. Leslie G. Corrie had been taking much interest in the introduction of Custard Apples as well as other desirable fruits. He had been making inquiries throughout the State for first-class varieties, and in the course of these inquiries he discovered Katterns' Custard Apple. Having tasted it, he at once realised the superb qualities of the fruit, and obtained scions, which he had grafted on to trees

growing on his Redland Bay properties. He distributed a number of scions through the Acclimatisation Society, of which he was President, to Mr. James Collins and others in the State, and in this way he obtained for the giant fruit a wide reputation. After this the variety was freely grafted by fruit-growers and nurserymen and the demand for plants of it has always exceeded the supply.

The production of Custard Apples in Queensland has risen during the past twenty years from a few hundred cases to about 20,000 cases (19,787 cases to 15th July, crop incomplete) in 1918, and the value of the produce to between £5,000 and £7,000.†

The name "Custard Apple" is used in a generic sense in the above statement. It may include various fruits with names such as Cherimolia, Cherimoya, Bullock's Heart, Sweet Sop, Sour Sop, Sugar Apple, Pomme Canelle, as well as many of Spanish or American origin. The botanical name of the Custard Apple is commonly spelt Anona by British botanists, but the American botanists now spell it Annona, as shown in the following extract*:—

"It is doubtful whether there is any other genus which contains so many species having edible fruits as the genus Annona. Already Linné seems to have anticipated this when he created the genus, for the name Annona signifies 'provisions'; it is not, as generally believed, derived from the pre-Linnæan name 'Anona,' which, after Linné, superseded Annona, in our days being again set aside for its older rival."

"Custard Apple" seems a better generic common name for anonaceous fruit than any other. It is English, whereas "Cherimoya" is of Mexican or South American origin. "Custard Apple" aptly describes the consistency of nearly all the fruits of the genus—*i.e.*, like a custard. In California, Florida, and the Philippines the name "Custard Apple" is applied exclusively to the fruit of *Anona reticulata*, but this fruit has long been known in the West Indies as the "Bullock's Heart," also at the Royal Gardens, Kew, and this name indicates well the appearance of the fruit, which is of the size and shape of a bullock's heart—smooth skin with reddish reticulate veins or markings.

The first record of the fruit in the world is that of the Dutch naturalist, Piso, who in 1648 described and figured species of Anona which he had found in Brazil in 1637. Since then there have been many additions to the number of species, until now there are about sixty. Only prominent ones which have been introduced or have fruited in Queensland will be dealt with here. The order *Anonaceæ* is represented in the Queensland flora by sixteen species, but none are of the genus Anona.

A. cherimolia (*Mill*)—The Cherimoya.—This is the most famous of the Custard Apples, and is the species most cultivated for the excellence of its fruit, especially in California and other parts of America, also in

*P. J. Wester in Phil. Agri. Review, Vol. VI., No. 7 (July, 1913), page 313.
†Area under Custard Apples in 1918=159 acres.

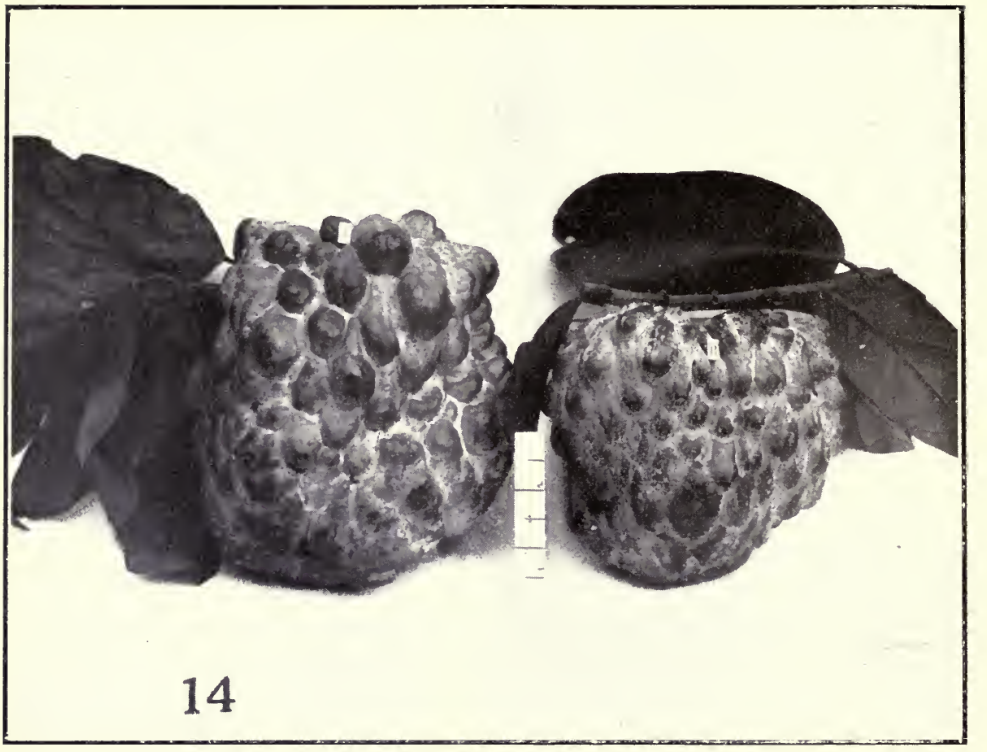


PLATE 14.—PINK'S MAMMOTH. (STRACHAN.)



PLATE 15.—COLLINS'S VARIETY.

Madeira and the Canary Islands. It is a native of the highlands of tropical America, from Mexico to Peru, being found at an elevation of 4,000 ft. It has been noted that it does not thrive in the tropics at a low elevation. It forms about 80 per cent. of all Anonas cultivated in Queensland. It is liable to much variation in size and form of fruit. The following varieties are recognised in Queensland, and there are a number of others more or less nearly allied to these which are at present unclassified.

The Island variety (Plate 1).—This variety was so named by the late Mr. L. G. Corrie because he first took notice of it on Garden Island, where he grew Custard Apples and other fruits. This fruit is small—average 8 to 10 oz.—but generally uniform in size and shape. It has a rich sub-acid flavour. The following are sub-varieties:—

Collins's Island (Plate 22).—This is the variety which Mr. Collins describes (page 7) as being obtained from the grounds of the Redland Bay Hotel. It is larger than the typical Island and has about the same fine flavour.

Moore's Island (Plate 2 and No. 16).—This has generally a smoother skin and more distinct reticulation. In Plate 2 a resemblance to *A. reticulata* (the Bullock's Heart) is noted, and it may possibly be a natural hybrid between that species and *A. cherimolia.* (See also No. 25.)

Strachan's Island (Plate 5).—This is about the best variety of the true Cherimoya type. It is larger than the type, has a very thin skin, and exquisite flavour. It was first borne by a tree belonging to Mr. Andrew Strachan, at Redland Bay. Mr. Strachan says of it: "The tree has been a good cropper every year for the past twenty-five years, and is the parent tree of Moore's."

Strachan's No. 1 (Plate 4).—This variety is distinct in shape, being like a pouch. The skin is fairly smooth and thin. The flavour is sweet and the flesh generally of good texture. The tree is said to be a good regular bearer. On plates 18 and 24 are fruits akin to this.

Bunker's Golden (Plate 32).—This is a fine cherimoya. It is fairly regular in size and shape and generally having large protuberances. As it becomes full grown the skin, especially around the protuberances, turns to a yellow colour, giving the fruit an attractive appearance. It was raised in the orchard of Mr. Edward Bunker, at Redland Bay, where it was probably planted by the late Mr. L. G. Corrie. The flavour is not so good as the type.

Pink's Mammoth (Plates 9, 12, and 14).—The species to which this variety belongs has not yet been determined, but it appears near *A. cherimolia* (Mill.) whilst showing some characteristics of *A. diversifolia,* Safford (1912). The seeds yielding this variety were introduced by Mr. James Pink, and the name Mammoth was used because of the great size of the fruit. The average weight of the four fruits figured is just over 3 lb., and the fruit figured on plate 12 weighed 5 lb. 11 oz. The tree,

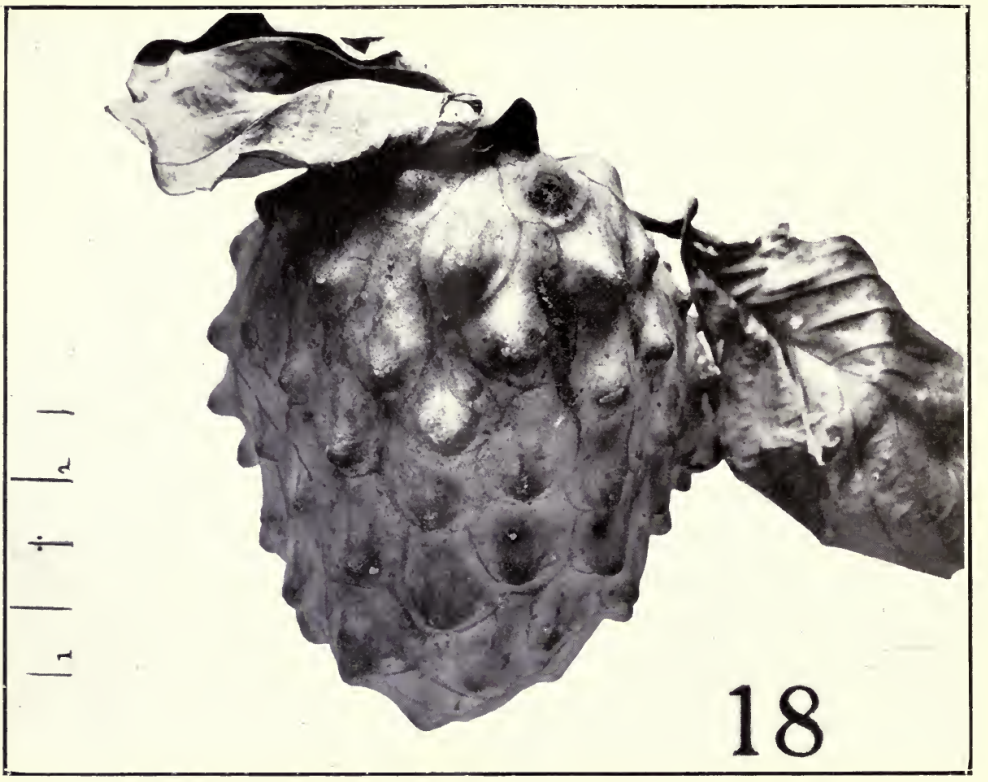


PLATE 18.—SMOOTH VARIETY. (MOORE.)



PLATE 22.—ISLAND. (COLLINS.)

as well as all its parts, are quite diverse in form. The branches are straggly and are of all sorts and sizes, so are the leaves, fruits, and seeds. It has been recorded that there appeared on one small branch (1) a fruit almost indistinguishable from a smotth heart-shaped cherimoya and (2) a large, uncouth, irregularly shaped fruit with prominent protuberances. The flesh is firm and the flavour is rich and aromatic, with a little acidity, which appears to increase its palatability. The seeds are generally few in proportion to the size of the fruit. This is the most popular variety in Queensland and is the one which the late Mr. L. G. Corrie did so much to make known.

Bunker's No. 1 is a nearly allied variety appearing on Plate 8. Fruits described under Nos. 15 and 27 are from seedlings akin to the Mammoth. They were raised by Mr. James Collins, being results of some of his plant-breeding work. All three are likely hybrids between the Mammoth and *A. cherimolia* (the Island type). They are more regular in form and size than the Mammoth, and the flavour is generally good. The fruit on Plate 9 is also in this class.

Kedron (Plate 7).—Was much in favour with Mr. Corrie, who at first called it Day's because Mr. Day, of Kedron, was the first to show it to him. Whilst discussing names it was thought that Mr. Corrie's name should be associated with some good variety, and the name Corrie's Late was provisionally applied to this one, but Mr. Corrie modestly refused to have his name used, and at his suggestion it was named Kedron. At Redland Bay it is sometimes called Bullock's Heart, but as this is the common name applied throughout the world to *A. reticulata* it seems better to call it Kedron. There are indications, however, that it might be a cross between that species (*reticulata*) and some other, possibly *A. diversifolia.* It has a particularly coarse exterior, but is more regular in form and size than the Mammoth, which it resembles in flavour and other qualities. Its reputed habit of fruiting late should commend it to growers so as to prolong the growing period.

A. glabra, L. (syn. *A. palustris* L, and *A. laurifolia,* Dunal.), the Alligator Apple or Mamon. This was one of the earliest of the genus to be described (see No. 17 on tabulated list), but has never come into favour as a fruit. It grows best near swamps and the fruit is readily easten by alligators. It is not palatable and is said to have certain narcotic properties. In a letter from Mr. Pink certain fruits are mentioned as being sparely eaten in British Guiana, which statement probably refers to fruits of this species. It has been recommended as a stock for grafting or budding. It has a wider natural distribution than any other species of the genus as it extends throughout the American tropics to Southern Florida and is also found in tropical Africa.

A. montana Macfad. (No. 13. See also in Mr. Soutter's notes, page 12).—This species was introduced from Ceylon. The trees that have been seen in Queensland are small and show signs of weak growth. Possibly they prefer a warmer climate than Southern Queensland. The



PLATE 24.—SMOOTH VARIETY. (COLLINS.)



PLATE 32.—BUNKER'S GOLDEN.

fruit described was from a tree growing at Mount Cotton. The flavour is poor—watery sweet, and the seeds are numerous. It is not a desirable kind to grow.

A. muricata, L. (page 26).— The Sour Sop is one of the oldest known kinds of Anona. It is indigenous to the West Indies and other parts of the tropics. It does not thrive in Southern Queensland, but is to be found growing well in the North. The tree figured is from Mossman district. The fruit is large, sometimes attaining a weight of 6 or 8 lb. It is of an irregular pyriform shape, and is covered with soft prickles or spines. It has a pleasant sub-acid flavour, but the pulp is inclined to be fibry. Fruit No. 11 may be from a cross between the Sour Sop and the Cherimoya.

A. reticulata—Bullock's Heart.—Another species requiring tropical conditions, and not common in Southern Queensland, but found growing well in the North. The name Bullock's Heart aptly describes the appearance of the fruit, which is heart-shaped, smooth, and has reddish reticulation or veining over the skin. The flesh is yellowish-white and of a good flavour. Plate 2 shows indications of *reticulata* characteristics.

A. squamosa L. (Plate 3. Sweet Sop or Sugar Apple).—This, like the Sour Sop, is a native of the West Indies, and requires tropical conditions for perfect growth. The tree has a regular system of branches—not so diffuse as the Cherimoya and the Mammoth. The fruit is heart-shaped or globular, with very prominent tubercules, and the average weight is about 8 oz. The flavour is good, flesh firm, but seeds are numerous.

Up to the time of going to press flowers were not available, hence the other fruits described, which are not otherwise known, have not been determined as to species. No. 6 is a distinct fruit of a regularly flat shape. No. 21 is the first fruit from a young Anona growing in Mr. Pink's garden at Badgen, Wellington Point. He obtained the seed *viâ* the United States Department of Agriculture from Paraguay. The skin was somewhat thick and hard and the flesh gritty. The flavour was fairly good. No. 23 is a fruit of a very distinct kind from the orchard of Mr. James Collins. It is of a dark cholcolate colour, and the skin is hard and much inclined to split or crack. The flavour is fair. The fruit No. 20 had the thickest and hardest skin of any of the whole collection. Judging from this and other characters it might be placed under *A. scleroderma,* and the fruit described as No. 19 might come under *A. lutescens,* being a bright lemon colour, and otheriwse resembling that species.

It is probable that, in view of the tendency of Anonas to cross-fertilisation, a number of the fruits described are from natural hybrids. Until the determination of species is complete little comment can be made on these. The fruit figured on Plate 11 shows signs of being a cross between *A. cherimolia* and *A. muricata.* This fruit is commonly called the Prickly or the Mount Cotton. It is quite distinct in its having

long prickly or pointed protuberances. It has a fairly good flavour and is reputed to be an early cropper. The tree is a regular bearer of medium-sized fruit and it is said to form a good stock. No. 10 is a distinct variety, possibly between *A. glabra* and *A. squamosa,* and that on Plate 2 already described as Moore's Island is probably *A. cherimolia-A. reticulata.* In this connection the following extract has some special interest[1]:—"In 1908, at the subtropical laboratory, Miami, Fla., U.S.A., the writer successfully hybridised the Cherimoya and the Sugar Apple,[2] the Sugar Apple and the Custard Apple,[3] the Cherimoya and the Mamon,[4] and the Mamon and the Sugar Apple. Several hundred seedlings resulted from this work, the hybrids between the Cherimoya and the Sugar Apple showing remarkable vigour and thriftiness."

Seeds of a cross between *A. cherimolia* and *A. reticulata* were obtained from New South Wales by the Director of Fruit Culture in May, 1918, and were handed to the Acclimatisation Society per the late Mr. Leslie G. Corrie. They were sown in the society's grounds at Lawnton.

[1] P. J. Wester—Philippine Agricultural Review, Vol. VI., No. 7.
[2] *Anona squamosa* L.
[3] *A. reticulata* L.
[4] *A. glabra* L.

RECORD OF INVESTIGATION OF VARIETIES OF CUSTARD APPLES.

Plate No.	Description or Name.	Specimen grown by	*Weight.	Foliage and Seed Mark.	Seeds.		Flavour.	Remarks.
					Number.	Size.		
1	Moore's No. 1 (Island)	Moore Bros., Redland Bay	lb. oz. 0 10¼	K	Numerous	Medium	First class ..	1. Typical Island variety, firm flesh of good flavour.
2	Island .. .. / Island × Strachan (?)	Moore Bros., Redland Bay	0 12	G1	Numerous	Medium	First class ..	2. Smooth thin skin, no waste, good flavour, near Strachan's (Plate 4), but more globular in shape.
3A	Anona squamosa (Sweet Sop)	Andrew Strachan	0 5½	None	Numerous	Small ..	Second class ..	3. Typical Sweet Sop.
3B	Anona squamosa (Sweet	Andrew Strachan	0 8½	A1	Few ..	Medium	First class ..	3B. Prominent carpels.
4	Strachan's No. 1 ..	Andrew Strachan	1 0¼	F	Rather few	Medium	First class, extra sweet	4. Smooth thin skin, no waste.
5	Strachan's No. 2 ..	Andrew Strachan	1 4½	None	Rather numerous	Medium	First class ..	5. Regular shape. Strachan says, "Tree has been a good cropper for 25 years, and is parent tree of Moore's (Plate 1)."
6	..	John Holzapfel, Mount Cotton	0 15¼	U	Forty (40)	Small ..	Watery sweet, poor	6. Tree good bearer of fruit, regular in shape and size.
7	Kedron or Day's (Corrie)	Ed. Bunker, Redland Bay	1 11	E	Few ..	Medium and small	First class ..	7. Distinct form, flesh thick and firm, very good flavour, convolutions deep.
8	Bunker's No. 1 ..	Ed. Bunker, Redland Bay	1 11	D	..	..	..	8, 9. Nearly related to the Mammoth (Plates 12 and 14), but more regular shape.
9	Bunker's No. 2 ..	Ed. Bunker, Redland Bay	2 10½	Z	Few ..	Large ..	First class	
10	Outridge's	P. P. Outridge, Redland Bay	2 14½	Q	Few ..	Small ..	Third class ..	10. Distinct form, convolutions too deep, poor flavour.
11	Prickly	Moore Bros., Redland Bay	1 1¼	A	Numerous	Large ..	Second class ..	11. Distinct form, flesh firm and thick.

* Where two fruits are figured on one mark the average weight is given. Specimens of leaves and seeds of each mark are being preserved for reference.

Record of Investigation of Varieties of Custard Apples—*continued.*

Plate No.	Description or Name.	Specimen grown by	Weight.*	Foliage and Seed Mark.	Seeds.		Flavour.	Remarks.
					Number.	Size.		
			lb. oz.					
12	Pink's Mammoth ..	P. P. Outridge, Redland Bay	5 11	R	Few ..	Large ..	First class ..	12. Extra large fruit of Mammoth variety, excellent flavour.
13	Slightly prickly, prickles very small	Fred. Kopp, Mount Cotton	..	X	Very numerous	Medium	Watery sweet, poor	13. Small prickles at points of carpels.
14A	Pink's Mammoth, typical fruit	Andrew Strachan, Redland Bay	3 7½	..	See No. 12	..	See No. 12	14B. From tree whose stock was 33 years old, scions were from A. Williams, Eight-Mile Plains.
14B	Pink's Mammoth, typical fruit	Moore Bros. ..	1 10½	R1				
15	Collins	James Collins, Redland Bay	2 4½	B	Fairly numerous	Medium	Good, but rather gritty	15. Regular heart-shaped fruit, slightly tuberculate, leaves extra large.
16	Moore's No. 2	Moore Bros. ..	0 15	N	Fairly numerous	Medium	Second class ..	16. A regularly shaped globular fruit and fairly smooth.
17	From tree about 45 years old or over ..	Wm. Moore, Redland Bay	0 4½	*a*	Few ..	Medium	Second class ..	17. One of the oldest trees observed.
18	Tree about 33 years old, seedling (?) from Bancroft's tree	Wm. Moore, Redland Bay	1 0	*b*	Numerous	Large ..	Second class ..	18. Planted by Henry Day, possibly from tree originally given to Dr. Bancroft by James Pink.
19	*Pale yellow* fruit, smooth	Wm. Moore, Redland Bay	0 11	*c*	Numerous	Small ..	Second class	19. 20. These trees were also planted by Henry Day about the same time as No. 18.
20	Broad, heart-shaped, very hard and thick skin	Wm. Moore, Redland Bay	1 2	*d*	Few ..	Medium	Second class, very gritty	
21	Tree from seed from Paraguay, *via* U.S.A.	James Pink, Badgen	..	*e*	Few ..	Medium	Second class, very gritty	21. This was the first fruit picked from the tree. The seed was sent to Mr. Pink by the U.S.A. Department at Washington.

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Record of Investigation of Varieties of Custard Apples—*continued.*

Plate No.	Description or Name.	Specimen grown by	Weight.*	Foliage and Seed Mark.	Seeds.		Flavour.	Remarks.
					Number.	Size.		
			lb. oz.					
22	Tree from seed from tree behind Redland Bay Hotel	James Collins, Redland Bay	0 12½	*f*	Many ..	Medium	Second class ..	22. Seedling from old tree (50 years) growing behind Redland Bay Hotel.
23	Chocolate seedling ..	James Collins, Redland Bay	0 8*	*g*	Few ..	Medium	Second class ..	23. Distinct type, skin dark chocolate colour.
24	Smooth-skinned seedling	James Collins, Redland Bay	1 2½	*h*	Many ..	Medium	Second class ..	24. A smooth-skinned variety of promise.
25	Like Moore's, Plate 2..	James Collins, Redland Bay	0 13½	*i*	Many ..	Small ..	Second class ..	
26	Pocket-shaped, like Strachan's, Plate 4	James Collins, Redland Bay	0 11	*j*	Many ..	Over medium	Second class ..	26. Sometimes called Jacques.
27	Seedling like Collins', Plate 15	James Collins, Redland Bay	1 4½	*k*	Many ..	Medium	Second class, somewhat fibry	
28	Yellowish skin, slightly prickly	James Collins, Redland Bay	0 11½	No mark	Many ..	Medium	Third class ..	
29	Seedling resembling Plate 7	James Collins, Redland Bay	0 9½	*l*	Many ..	Small ..	First class ..	
30	Seedling, poor fruit, like Plate 17	Andrew Strachan, Redland Bay	0 3½	*m*	Few ..	Small ..	Third class ..	30. From old tree at Strachan's.
31	Anona squamosa (Sweet Sop)	Andrew Strachan, Redland Bay	0 7½	*n*	Few ..	Medium, light-brown colour	Second class ..	31. Probably a variety of Sweet Sop *seeds very distinct*, light brown colour.
32	Bunker's Golden ..	Edward Bunker, Redland Bay	1 2½	*o*	Rather few	Medium	Second class ..	32. Variety prized at Redland Bay because of turning yellow when ripe, giving fruit tempting appearance.

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