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### CORRESPONDENCE.

[The Department does not necessarily concur with the opinions expressed, but correspondence and articles are always welcomed.]

Erimahafen Plantation,  
Madang, New Guinea,  
1st November, 1937.

The Director,  
Department of Agriculture,  
Rabaul

Dear Sir,

It was noticed in the early issues of the *New Guinea Agricultural Gazette* that the planters were invited to contribute articles to this journal, but I have not as yet read any articles originating outside your Department.

As I consider it the duty of the planting community in general to assist you in establishing this journal—a very necessary publication for the improvement of the Territory in an agricultural sense—I am attaching herewith a small article dealing with the possibilities of dwarf coco-nuts in New Guinea, and should you consider it suitable for publication hope that it will encourage other planters to express their views through your journal.

Assuring you of my assistance at all times.

Yours faithfully,

(Signed) B. G. HALL.

## THE POSSIBILITY OF CULTIVATING DWARF COCO-NUTS IN NEW GUINEA.\*

By B. G. Hall.

Now that copra has attained a profitable figure, and the majority of planters are able to run their plantations economically and with a fair margin of profit for their capital outlay, it is found that the coco-nut remains as yet the mainstay of the Territory of New Guinea.

However, despite the recovery of the copra market, it should be the duty of every planter who takes an intelligent interest in the development of his property, to investigate ways and means of increasing his returns still more from coco-nuts, and if he has decided to plant a further area of this crop, consideration should be given, where conditions appear suitable, to the planting of Malayan dwarf varieties. It must be clearly understood that the writer by no means suggests that the dwarf variety should be planted in preference to the ordinary "tall" palm, but feels that the dwarf coco-nut offers a most interesting subject for careful consideration, and, no doubt, there are areas in New Guinea, such as Kar Kar Island and Talasea, where it would thrive.

The following opinions and information, which have been obtained from outside sources, may prove interesting to planters who are more or less interested in this variety of coco-nut palm.

### Varieties of Malayan Dwarf Coco-nut.

As yet there has been no known variety of dwarf coco-nut classified as being peculiar to New Guinea, and the few odd palms which may be found in the Territory have been obtained in a majority of cases from the Solomon Islands, where several areas of so called "King" coco-nuts have been planted.

In Malaya there are three recognized varieties under cultivation, namely—

Dwarf yellow,

Dwarf red,

Dwarf green,

which are characterized by the colours as specified. The yellow variety appears to be most popular, and the heavier producer, and some remarkable production figures have been obtained from this variety, under ideal conditions, particulars of which will be given later.

### Soil.

It appears that the soil must be the best available, in accordance with the usual rules governing coco-nut culture, but no doubt average soils, properly treated by the establishment of cover crops such as *Centrosema pubescens*, *pueraria* or *calopogonium*, or other leguminous covers, together with careful and efficient drainage, and if considered necessary forking, would produce most satisfactory results.

### Planting Distance.

This variety is a dwarf in every respect, and its growth is approximately half that of the ordinary "tall" variety, so that the distance of planting may be much closer, and consequently the number of palms per acre is increased and under favorable conditions the output per acre.

\* *Editorial Note.*—This subject has been dealt with in detail by the Economic Botanist as a subsection in his article "Coco-nut Improvement" appearing in this issue. Mr. Hall's article, however, is presented in a popular way.

It is the practice in Malaya, and I have been recommended likewise, to plant approximately 22 feet x 22 feet square giving 90 palms to the acre, but the writer personally would suggest planting 22 feet x 22 feet on the equilateral triangle, thus obtaining more palms per acre, and making greater use of the ground available.

It is an accepted fact that there is nothing to be gained by giving a palm more ground area than it actually requires for its normal development, and therefore, from information obtained from the *Malayan Agricultural Journal*, it appears that 22-ft. planting was quite sufficient when the area was extensively drained and irrigated, with *Centrosema pubescens* established over the whole area, and the matter of planting on the square or triangle is purely a matter of taste. It has been asserted by one authority<sup>(1)</sup> that spacing 15 feet x 15 feet has given the best results. However, the writer is of the opinion—influenced by personal observations of the coco-nut palm and advice from Malaya regarding the dwarf variety—that the closer planting may give greater yields during the first few years of bearing, but the larger distance would as the palms grow older produce more heavily and have a longer span of life, which is a most important factor to be considered with any crop.

### Yield.

Under ideal conditions, some remarkable yields have been obtained, and some very interesting figures were published recently in the *Malayan Agricultural Journal* regarding an area of 41 acres, planted in 1920, which has been extensively drained, irrigated at intervals, and had cover crop established throughout, the cover plant proving most suitable being *Centrosema pubescens*. The soil was coastal alluvial clay, which in an undrained condition was grey in colour on the surface, changing to blue or blue grey a few inches below the surface down to the water table and further. This type of soil is quite common in New Guinea. After proper drainage and efficient aeration of this soil—establishment of cover crops—it was observed that a complete change took place and the soil showed itself as rich in all plant foods, the quantity of which was governed only by the depth of drainage, and was most suitable for the cultivation of coco-nuts. This area, as will be seen from the following figures, responded magnificently to this treatment, and will serve to give some idea as to the possibilities of this variety of coco-nut palm:—

Year.	Number of nuts harvested.	Average number of nuts.	Copra per acre.	Number of nuts.
		Per palm.	Cwt.	Per cwt.
1925 .. ..	194,530	56	9	508
1926 .. ..	235,360	67.5	11	509
1927 .. ..	209,876	60	8	622
1928 .. ..	386,876	111	17	560
1929 .. ..	235,444	67.5	10	509
1930 .. ..	368,056	106	17	508
1931 .. ..	371,645	106.5	17	508
1932 .. ..	345,208	99	18	448
1933 .. ..	514,091	148	30	386
1934 .. ..	470,628	135	28	387
1935 .. ..	631,219	162	32	386

It appears that from 1931 onward extensive irrigation was carried out on the area, with the results as illustrated in table above. The average over the eleven years from 1925-1935 was 17.9 cwt. per acre, or 44.7 cwt. per hectare, which is really phenomenal, and it will be noted that when the area first came into bearing in 1925, the output was at the rate of 9 cwt. per acre or 22.5 cwt. per hectare, which when we consider that a New Guinea plantation producing 1 ton per hectare when fully bearing is considered a very good property, exemplifies the fact that the dwarf variety should be given further consideration as an economic crop in New Guinea. When observations were last taken in 1935, this area was producing approximately 4 tons per hectare, and with corresponding care and attention to their cultivation, the writer is of opinion that yields of 3 tons per hectare in parts of New Guinea should not be an impossibility. The cultivation of the dwarf coco-nut in New Guinea is as yet purely a matter for conjecture, and experimental plots would necessarily have to be planted before its adoption by private planters could be recommended.

Despite the aforementioned excellent results obtained in Malaya, the fact must not be overlooked that there are many drawbacks which tend to counter-balance the main advantage offered by dwarf coco-nuts of giving a crop after five years, compared with eight to ten as is the case with the "tall" palms. The chief disadvantage being the fact that the dwarf variety does not remain in bearing as an economically profitable crop nearly as long as the "tall" variety, a factor which is most important, but which may be equalized by greater production per hectare. And again, it is generally accepted that copra produced from dwarf varieties is, as a rule, inferior to that of the "tall" palm, a fact which can reflect in numerous ways.

From information received from the Department of Agriculture, Kuala Lumpur, in regard to the dwarf coco-nut in Malaya, it appears that this variety is very susceptible to any unfavorable factors, and adequate rainfall, suitable soil, efficient drainage, together with careful cultivation, are absolutely essential to its successful cultivation. Where we find the ordinary "tall" palm living in soil waterlogged for a considerable period of the year, and still bearing quite favorably, under the same conditions any attempt to cultivate "dwarf" palms would be disastrous and could not possibly meet with success.

In regard to the possibility of cultivating the dwarf palm in New Guinea, we have, undoubtedly, excellent soils and abundant rainfall, and the matter of drainage and cultivation is a matter which rests in the hands of the person controlling the area, and his attitude towards such matters. The question of drainage is a matter not entirely understood by many planters, and as this is a most important and vital phase of cultivation in connexion with the "dwarf" palms, as well as the "tall", a few remarks on this matter would not be wasted.

### Drainage.

It must not be considered that when drainage is referred to, that this means the absolute removal of all water from the soil, but when referred to in connexion with the cultivation of coco-nuts interpreted as simply meaning that there is movement of water in the soil as opposed to stagnation, and it has been well established by such authorities as Copeland and Sampson<sup>(2)</sup> that movement of soil water is most essential to ensure proper development and growth of the coco-nut palm.

The subject of drainage has been ably described in the *Malayan Agricultural Journal* by Messrs. Wardlaw and Mason<sup>(2)</sup> in which they state, *inter alia*—

In the case of coco-nut cultivation the writers would consider a well-drained soil one in which there is a constant soil water movement, but this movement should be very slow, in fact, a bare seepage, and by no means of such a nature as to result in washing the soil, as this might prove to be harmful.

If no movement takes place, then steps should be taken either by additional drains, or the planting of suitable covers to rectify matters. A badly-drained soil will be one in which soil water movement was non-existent, thus giving a "still" or stagnant water table near the surface, conditions under which coco-nuts will not thrive for long.

Taking into consideration the requirements of this variety of coco-nut palm, and noting to what extent they can be satisfied by conditions in New Guinea, there is really no reason why the successful cultivation of this "dwarf" could not be undertaken, and careful research and experiment by the Department of Agriculture or the large planting interests are well warranted, as good coco-nut land in New Guinea, although not scarce, is becoming more difficult to obtain, and the planter is now, more than ever, desirous of obtaining the maximum return from his available land.

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### REPORT ON SOME DUST AND MUD DEPOSITS RESULTING FROM THE RECENT VOLCANIC ERUPTIONS AT RABAU, ISLAND OF NEW BRITAIN, NEW GUINEA.

By J. S. Hosking, Division of Soils, Council for Scientific and Industrial Research.

Seven samples representing dust, mud and ash deposits derived from the recent volcanic eruptions at Rabaul have been examined.

The deposits vary in texture from sandy loams to loams bordering on clay loams. The dust deposits from the Vulcan Island Crater, and the rain-washed and sorted material, fall within the former class, and the hardened mud and compacted ash from Matupi Crater, fall within the latter class; the mud layer from Matupi is intermediate in texture. The deposits have an extremely floury consistency, being composed mainly of fine sand and silt; the ratio of fine sand to silt varying from 2:1 to 3:2. The washed and sorted material is the only sample showing any appreciable concentration of coarse pumiceous sand. All materials are highly abrasive.

No free acid is present in the deposits which vary in reaction from slightly acid (pH 5.0) in the Matupi mud layers to slightly alkaline (pH 7.7) in the underlying Vulcan Crater dust layers. The washed and sorted deposit from Vanalea is the most alkaline with a pH of 7.9.

The deposits were examined for soluble salts, 200 gms. of each being extracted with 1 litre of distilled water. The total salt content varied from about 3 per cent. in the more acid deposits from Vulcan Crater to about 1 per cent. in the alkaline Matupi mud layers. The washing of the Vanalea deposit has resulted in marked leaching of this material, less than 0.1 per cent. of salt being present.