

CEYLON.



SESSIONAL PAPER IV.—1945.

Annual Report of the Coconut Research  
Scheme for 1943.

**MAY, 1945.**

*Printed on the Orders of Government.*

PRINTED AT THE CEYLON GOVERNMENT PRESS, COLOMBO.

To be purchased at the GOVERNMENT RECORD OFFICE, COLOMBO; price 45 cents.

1945

—J. N. A 49125-459 (8/46).

## COCONUT RESEARCH SCHEME.

### ANNUAL REPORT OF THE BOARD OF MANAGEMENT FOR THE YEAR 1943.

(In terms of Section 8 (2) of the Coconut Research Ordinance (Cap. 303).

#### BOARD OF MANAGEMENT.

On January 1, 1943, the Board of Management consisted of the following members:—

Chairman: The Acting Director of Agriculture (Mr. M. Crawford).

The Deputy Financial Secretary: (Mr. C. E. Jones, C.C.S.).

The Chairman of the Low-Country Products Association of Ceylon: (Mr. A. F. R. Goonewardene).

Members of the State Council nominated by His

Excellency the Governor:

Representatives of the Low-Country Products

Association

Representatives of the Planters' Association of

Ceylon:

Representing the Small-holders nominated by His

Excellency the Governor

{ Mr. Dudley S. Senanayake, B.A., M.S.C.

{ Mr. E. R. Tambimuttu, M.S.C.

{ Mr. Chas. A. M. de Silva

{ Sir Wilfred de Soysa.

{ Mr. O. B. M. Cheyne.

{ Mr. A. R. Ekanayake.

{ Mr. G. Pandittesekera, J.P., U.M.

{ Mr. D. D. Karunaratne, J.P.

Mr. E. Rodrigo resumed duties after sick leave as Acting Director of Agriculture and *ex officio* Chairman of the Board from January 4.

Mr. S. Pararajasingham was elected Chairman of the Low-Country Products Association in March and succeeded Mr. A. F. R. Goonewardene as an *ex officio* member of the Board. Mr. Pararajasingham had previously been a member representing the Low-Country Products Association from 1932-1933.

Mr. E. R. Tambimuttu ceased to be a member of the State Council and so of the Board in July. Mr. S. Dharmaretnam, M.S.C. for Batticaloa South, was nominated by His Excellency the Governor in his stead. Mr. Dudley S. Senanayake's period of service terminated in May and he was re-nominated as a member representing the State Council for a further term of three years.

Mr. W. P. H. Dias was nominated by the Planters' Association of Ceylon with effect from February 9, in place of Mr. A. R. Ekanayake, upon the expiry of the latter's term of office.

Four meetings of the Board of Management were held during the year, on April 30, July 30, September 13, and December 20. The Director of Research acted as Secretary to the Board at all meetings.

#### COMMITTEES.

*Buildings Sub-Committee.*—Personnel: Mr. G. Pandittesekera (Chairman), Mr. O. B. M. Cheyne, and Mr. A. R. Ekanayake. Secretary-Convenor, Dr. R. Child. At the meeting of the Board of Management held on July 30, Mr. W. P. H. Dias was elected a member of this Committee in place of Mr. Ekanayake. The Committee held three meetings during the year, on February 4, March 26, and November 27.

#### 2. Staff.—

Director of Research and Technological Chemist: Dr. R. Child, B.Sc., Ph.D. (Lond.), F.I.C.

Geneticist: Mr. W. V. D. Pieris, M.A. (Cantab.), B.Sc. (Lond.), Dip. Agric. (Cantab.).

Soil Chemist: Dr. M. L. M. Salgado, B.Sc. (Lond.), Ph.D. (Cantab.), Dip. Agric. (Cantab.).

Superintendent of Estates: Mr. P. J. Nenis.

Mechanic: Mr. R. Werapemall.

Mr. E. H. K. de Silva, Shorthand-Typist since September 1, 1937, left the service of the Scheme on January 4 to take up an appointment with the Ceylon Savings Bank. Mr. C. S. A. Fernando was appointed to the vacancy on February 1. Mr. P. T. Fernando was appointed as a temporary clerk from August 1.

Mr. E. Chinnaraen, B.Sc., Technical Assistant to the Soil Chemist from March 4, 1934, left the service of the Scheme on February 15 to take up a service appointment. A new appointment is pending.

Mr. W. D. Frederick was appointed Conductor, Bandirippuwa Estate, from March 1.

The Director of Research was absent in India on special duty for the Department of Medical and Sanitary Services from February 16 to March 17. The Geneticist was in acting charge of the Scheme during this period.

The Soil Chemist was on long leave from July 1 to the end of the year. During this time the work of his department was supervised by the Director of Research.

The secretarial and accounting work of the Board has been carried out as usual at Bandirippuwa estate under the supervision of the Director of Research, with the assistance of the Superintendent of Estates.

#### 3. Legislation.—

The draft Amending Ordinance establishing rules for the Provident Fund, prepared by the Legal Drafterman, was approved by the Board (with minor amendments) at the meeting held on December 20.

## 4. Summarised Departmental Reports.—

The technical departments have been working with some difficulty during 1942 and 1943 owing to shortage of staff and the loss of experienced men. The loss of clerical staff and replacement by less experienced officers resulted in a considerable reduction of the time the Director of Research could devote to technical work owing to increased attention required to accounts and administration. The post of Technical Assistant to the Geneticist was not filled after the resignation of Mr. C. L. de Zylva in January, 1942, and the duties of this officer devolved on the Senior Field Assistant, Mr. C. W. S. de Silva, who has discharged them satisfactorily. The Technical Assistant to the Soil Chemist who left in 1943 was an officer of nine years experience.

The loss of efficient officers has been due to the attraction of more lucrative employment in Government Departments and (temporarily) with the services. The Scheme has not been in a position to offer terms of service sufficiently attractive to retain the best of its subordinate staff.

The Board of Management at the meeting of September 17, 1943, considered the revision of salary scales; it was felt that this could only be useful if discussed in relation to the general financial position of the Scheme, and approached on the lines of the 1938 memorandum. It will be recalled that in 1939 a memorandum containing tentative proposals for the expansion of the Scheme's work was referred to the associations and other bodies represented on the Board of Management, including the Low-Country Products Association and the Planters' Association of Ceylon, and through the latter to the district associations interested in the coconut industry. A good measure of public support was obtained for these proposals, which included provision for an increase of the cess. However, on the outbreak of war on September 3, 1939, the Board decided to defer the proposals indefinitely. (See Government Sessional Paper VIII.—1940, page 4). At the meeting on September 13, 1943, the Board decided that the time was now suitable for reconsideration of the 1938 memorandum and this is accordingly being brought up to date for submission to the authorities concerned in 1944.

Meanwhile, the Board has taken what action is possible in present circumstances, and within the limitations imposed by its income. Approval has been given to the appointment in 1944 of a Secretary-Accountant, and terms of service of the subordinate staff have been somewhat improved.

## A. Technological Chemist's Department.—

(i.) Copra: (c) Copra from Fallen Nuts.—The scarcity of pickers and the consequent delays to picking on many estates led to interest being shown in the results of allowing nuts to fall naturally. It had been mentioned in a previous report (for 1937, Sessional Paper IV.—1938, page 4) that fallen nuts give a somewhat better yield of copra.

A field trial in 1943 gave the following results:—

	Number of Nuts cured.	Rejections.	Per Cent. Rejections.	Copra (Candies).	Out-turn (Nuts/candy).
Fallen Nuts	28,634	323	1.1	23,438	1.222
Picked Nuts	68,393	531	0.8	54,504	1.255

## Quality of Copra.

	Fallen Nuts.		Picked Nuts.	
	Candies.	Per Cent.	Candies.	Per Cent.
No. 1 Copra	21,455	91.5	50,739	93.1
No. 2 Copra	1,708	7.3	3,123	5.7
No. 3 Copra	0,275	1.2	0,642	1.2
	23,438	100.0	54,504	100.0

The out-turn from fallen nuts was rather the better, and there was only a small increase in the percentage of No. 2 copra. Further trials will be carried out in 1944. In the meantime it may safely be said that there is no objection to allowing nuts to fall naturally provided regular collections are made.

From the second crop of 1943 onwards fallen nuts on Bandirippuwa Estate were collected separately; the fallen nuts form a higher percentage of the crop in the case of the 2nd and 5th picks, both of which are taken at a time following dry spells, i.e. in early April and early October. Actual figures are as follows:—

Crop.	Fallen.	Picked.	Total (Compare para. 7 of this report).	Per Cent. Fallen nuts.
2	28,634	68,393	97,027	29.5
3	26,118	100,579	126,697	20.6
4	12,474	81,779	94,253	13.2
5	28,896	56,074	76,970	37.1
6	3,689	33,820	37,509	9.8

(b) White Copra.—The patent copra kiln was not in use in 1942, but during the year under review 61,294 nuts were cured, giving 49 candies 144 lb. copra, of which 43 candies 376 lb. were white copra (88 per cent.). There was no overseas market for white copra, but a small premium was realised locally.

COCONUT RESEARCH SCHEME.

(c) *Copra from Dwarf Palms.*—Copra samples from nuts of 14 dwarf palms on Bandirippuwa Estate are being cured separately, and analysed; three lots from consecutive picks had been examined by the end of the year. The oil percentage (dry weight) show some variation between palms but the average of 68.6 on 37 samples to date is not markedly different from the usual figures for copra from tall palms.

Average out-turns were as follows:—

Crop.	Date.	No. of Nuts.	Weight Copra lb.	No. of Nuts/candy
3 ..	May	268	75.83	1,979
4 ..	July	230	61.67	2,088
5 ..	October	138	40.58	1,904
		636	178.08	2,000

This out-turn figure of 2,000 nuts/candy may be compared with that quoted by H. W. Jack (*Malayan Agric. J.*, 1924, 12, 371) for dwarf nuts of 500 to a picul of copra which corresponds to 2,100 nuts per candy.

This work is to be continued until six consecutive picks have been completed.

(d) *Miscellaneous: San Ramon Copra.*—Three interesting samples of copra were submitted by an estate in the North-Western Province, prepared from nuts of San Ramon (two lots) and "Marandique" palms growing there. (The latter is also a Philippine, San Ramon Type).

Sample.	No. of halves.	Wt. (gms.)	Calculated out-turn nuts/candy.	Moisture.	Oil Per Cent. Per cent. Dry Wt.)
1 San Ramon	6	885	860	3.4	65.8
2 San Ramon	4	583	870	6.6	68.4
3 Marandique	8	1,075	945	8.4	67.1

Observations are being continued on copra from these palms, with regard to their out-turn and oil content.

*Cocos Islands Copra.*—A small sample of copra from the Cocos Islands (4 halves) weighed 334 grams corresponding to an out-turn of 1,520 nuts per candy. The nuts had been split longitudinally, as is the practice on some estates in the Eastern Province of Ceylon. The copra had moisture 5.2, oil 65.5, oil (dry weight) 69.2 per cent., Free fatty acid of pressed oil 0.9 per cent.

(ii) *Capric and Caprylic Acids.*—Samples of pure capric and caprylic acids were prepared from coconut oil for the Rubber Research Scheme in connection with an investigation of the influence of fatty acid sodium salts on the vulcanising properties of rubber.

(iii) *Arack: Higher alcohols.*—It was noted in the report for 1941 (Government Sessional Paper XI.—1942, page 4) that the esters in arack consist predominantly of ethyl acetate and the aldehydes of acetaldehyde. Attention was devoted in 1943 to the "higher alcohols". These were estimated by the Government Laboratory method on twenty samples taken at different stages from experimental distillations. Highest percentages were found in "foreshots" samples; for example in the distillation of 624 gallons of "low wines" of 36.6 u.p. containing 180 parts "higher alcohols" per 100 litres alcohol, the first runnings had "higher alcohols" 1,800 parts, the bulked middle runnings (5th to 263rd gallons) 140 parts, and the tailings 40 parts per 100 litres alcohol.

The nature of these "higher alcohols" requires further study. Popularly known as "fusel oil" these constituents of distilled liquors are usually regarded as derived from the protein bodies present in the mashed grains, &c. The protein content of toddy is so small that the derivation of "higher alcohols" in arack is obscure.

The Government Laboratory method is a colorimetric one and it is possible that in the case of arack the results are unreliable. However, two comparative determinations by the Allen Marquardt method gave figures which, whilst not in close agreement with the Government Laboratory results, at least indicated that the general order of results by the latter is correct. Further work is projected.

(iv) *Miscellaneous: (a) Sediment Poonac.*—In some oil mills it is the practice to collect sediments from the oil filters and settling tanks. This sediment is roughly pressed to recover low-grade oil, and the residue "sediment poonac" is disposed of as fertilizer. It is a variable material as the following figures show. (Nos. 1-3 are from previous records; Nos. 4-6 were examined for enquiries during 1943):

Analyses of Sediment Poonac.						
	1.	2.	3.	4.	5.	6.
Moisture	27.4	24.0	7.9	16.8	17.5	10.9
Oil	19.6	29.0	23.0	16.9	8.8	36.7
Ash	7.2	7.3	8.3	7.4	—	—
Nitrogen	5.3	5.6	7.2	6.3	6.9	5.0
Nitrogen (on oil and moisture (dry weight))	10.0	11.0	10.4	9.5	9.4	9.5

In C. B. S. Leaflet No. 9 (Sept. 1940, page 4) it is stated that this poonac contains 7 per cent. nitrogen. It will be observed from the above analyses that this is only true for samples which do not exceed a total of about 25 per cent. for moisture plus oil. It can generally be told from inspection whether samples are reasonably dry and well pressed; thus sample 5 was a dry friable powdery material, while sample 6 was oily and soggy.

It is usually sold at prices which make it compare favourably as a nitrogenous fertilizer with groundnut cake, but the supply is of course limited. Two tons were successfully applied in 1942 during the manuring of Bandirippuwa estate at the rate of 12 lb. per palm, supplemented with 1 lb. saphos phosphate and 2½ lb. muriate of potash (60 per cent.).

(b) Other samples examined for enquiries included a sample of edible coconut oil. The method of preparation was not stated. The sample had moisture 0.16, free fatty acid 0.20 per cent. (lauric); other analytical figures were normal. It was reported as a good sample of oil, but a little below edible grade.

(v.) *Soils and Fertilizers.*—In the latter half of the year the Technological Chemist's Division took charge of the laboratory side of the work of the Soils Division as far as possible.

(a) *Fertilizers for NPK experiment.*—Fertilizers (muriate of potash, groundnut cake, sulphate of ammonia) for application to the NPK experiment—see CI (i.)—were analysed. All were up to guarantee.

(b) *Calcium Cyanamide: Changes on Storage.*—Reference was made in the 1941 report (Government Sessional Paper XI—1942, page 9) to the effect of storage for over a year on calcium cyanamide. At that time the samples contained between 14 and 16 per cent of nitrogen. Two samples—one powdered and the other granular—were examined in November, 1943, after over three years storage in bags without special precautions.

The granulated sample contained 12.1 per cent. nitrogen; of this only 1.9 per cent. was cyanamide nitrogen, and 6.9 per cent. dicyandiamide nitrogen, i.e., 57 per cent. of the nitrogen content was in the form of dicyandiamide. The powdered sample contained 8.4 per cent. nitrogen.

It was obviously undesirable to use this material on the manurial experiments and, as mentioned in Section CI (i.) applications to the calcium cyanamide plots of the Bandirippuwa NPK experiment were postponed until the arrival of a fresh consignment.

The old sample was applied to 25 palms on Bandirippuwa estate to observe any adverse effects which might occur.

(c) *Husk Ash Samples.*—Six samples of ash were examined, five from husks (A-E) and one from estate debris (fronds, butt-ends, old fallen immature nuts, &c.) burned in the field (F). Samples were sieved through a fine mesh and the percentage of coarse matter recorded. The five samples were analysed for moisture, insoluble matter, potash, chlorides and carbonates. If the chlorides are calculated as potassium chloride, and carbonates as potassium and sodium carbonates, it is found that the bulk of the material is accounted for when the analytical figures are summed.

#### Analyses of Ash Samples.

	A.	B.	C.	D.	E.	F
Percentage fine material ..	100	73.6	73.7	88.2	87.1	81.6
(sieved in field)						
Percentage potash on original ..	10.0	6.8	5.7	11.0	8.7	9.4

#### Details of fine Samples.

Percentage Moisture ..	9.7	7.2	12.8	13.2	13.4	6.4
Percentage Insoluble ..	68.8	75.8	69.6	63.8	65.6	88.6
Potassium chloride ..	7.1	5.6	4.4	6.2	7.4	1.4
Potassium carbonate ..	8.1	6.7	6.1	11.4	7.3	—
Sodium carbonate ..	5.2	4.3	5.7	4.7	6.2	2.4
	98.9	99.6	98.6	99.3	99.8	99.8

#### B. Department of Genetics.

The introduction of a grade of assistant designated Nursery Attendants, approved by the Board on December 14, 1942, has effected noticeable economies in the working of the Genetics department. These employees, under the supervision of the Field Assistant, undertake most of the routine yield recording and connected work on co-operating estates, as well as nursery management on Bandirippuwa and Ratmalagara Estates. One Nursery Attendant is stationed at Ratmalagara Estate and experimental work in progress there is much better supervised.

##### 1. Bandirippuwa and Ratmalagara Estates.—

(a) *Yield Recording.*—The routine field observations referred to in last year's report have been maintained and extended further to include 39 golden-yellow king coconut and 19 San Ramon palms on Bandirippuwa estate.

(b) *Mother Palms.*—After the grading up of mother palms in Bandirippuwa Estate carried out in 1941, 121 individuals were retained for seed production in 1942, 66 of them for the supply of Grade I. and the balance for Grade II. material. These numbers have been maintained in the year under review.

(c) *Latin Square Experiment.*—This field experiment, reference to which has been made in previous reports, has been maintained in good order in the year under review. The great scarcity of labour in the first half of the year hindered the usual field cultivations, but after the appointment of the resident Nursery Attendant, the labour situation improved and the block was restored to a

first-rate condition by September. The annual manuring of palms was carried out in November with 1 lb. of sulphate of ammonia and 1½ lb. of muriate of potash per palm and, since the block had been intensively cultivated under food-crops since 1939, without adequate phosphatic manuring, 2 lb. of saphos phosphate per square were broadcast and harrowed in in order to maintain the fertility level.

The stand of pineapples on the drain bunds between rows of palms has been maintained and treated with a heavy weed mulch, which is known by experience to be very good for this crop. Bombay cowpea was sown in November in ploughed and harrowed strips between the rows of palms, but it was found that under these conditions the cowpeas were hardly able to keep pace with weeds. It is now abundantly clear that successful cultivation of foodcrops under coconut must be preceded and attended by clean-weeding of the land. The more fertile the land, the more necessary it is keep it free of weeds.

(d) *Dwarf Palm Block*.—With the exception of a few vacancies due to the destruction of seedlings by drought, the 10-acre block of dwarf palms on Ratmalagara Estate is now fully stocked and, under the direct supervision of the resident Nursery Attendant, is receiving better agricultural attention than was formerly possible. Twenty-eight of the palms have now come into flower in the third year after planting. Identification boards were fixed to all seedlings in November in order to facilitate field observations of individual palms.

### II. Nurseries and Issue of Planting Materials.

The nurseries in both Bandirippuwa and Ratmalagara have been fully stocked with seednuts throughout the year and those at Ratmalagara were more centralized and extended.

After the record-breaking issues of seed coconuts and seedlings in 1942, referred to in the report for that year, which were largely related to the opening up of jungle land for emergency food production, it was not to be expected that a similar volume of planting material would be released in the year under review also, but it is gratifying to record that although the demand naturally slackened off to some extent, it still remained high and 37,069 seednuts and 19,496 seedlings were issued during the year. Of these numbers 7,069 seednuts and 17,391 seedlings were derived from individually recorded mother-palms and the balance from high yielding blocks on Bandirippuwa Estate. Besides these issues, there were also distributed nearly 1,000 seednuts and seedlings of varieties other than the ordinary tall plantation variety of palm. The extent planted in 1943 with seednuts and seedlings issued from the Coconut Research Scheme is estimated at about 800 acres.

During the eight years, 1936 to 1943, the Coconut Research Scheme has issued 342,901 seednuts and 88,252 seedlings. Of these 166,276 seednuts and 66,147 seedlings have been derived from selected mother palms on Bandirippuwa Estate and co-operating estates and have been utilized for replanting old estates or planting new areas under estate management. The balance of 176,625 seednuts and 22,105 seedlings have been derived from high yielding blocks in Bandirippuwa Estate and have been issued to revenue officers and agricultural societies in charge of peasant agriculture. The total area planted during this 8-year period with seed material issued by the Scheme is estimated at about 6,600 acres or 825 acres a year. This does not take into account the extent planted up by proprietors with seed material derived from mother-palms selected on their estates for their own use by the Geneticist and his field staff.

Some of the nursery-beds at Bandirippuwa, which are usually empty in December and January, that is to say between the removal of seedlings for the North-East monsoon planting and the planting of seednuts for the following year, were put down to Bombay cowpea as a food-production measure, the intention being to produce seed for more extended planting on the estate in 1944. The crop has been manured according to the recommendations in the Department of Agriculture Food Production Leaflet No. 18 and the soil has been further improved by the addition of fibre dust and cattle manure after planting.

### III. Co-operative Activities.

(a) *Seed Production*.—Co-operative yield-recording on private estates was rendered somewhat difficult in 1943 owing to the general shortage of pickers, but it is to the great credit of proprietors and superintendents that yield-recording, though subject to some unavoidable delays, continued throughout the year on all estates except one. Work on this estate and another which has become difficult to visit in war-time has been suspended for the duration. This led to a reduction of 83 seedbearers and recording was done on 1,681 palms on 24 estates.

(b) *Experimental Plantation I*.—This plantation was put down in November, 1934, on 5.3 acres of cleared virgin forest attached to an estate near Chilaw and consists of 292 palms derived from the unselected progeny of nine proved high-yielding palms on that estate. The objects of the experiment were to study (1) the nature of inheritance of the character of high-yield and associated characters by the unselected and uncontrolled progeny of high-yielding parents and (2) the relative merits of seednuts derived from first and second ripe bunches. The 10 year average yield performance of the nine mother palms from 1932 to 1941, range from 83 to 152 nuts.

The flowering record of the palms is given in the Table below. The percentages given in the last column of the Table have been calculated on the total number of seedlings originally planted, no corrections being made for later supplies put down to replace casualties in the old stand.

Period after Transplantation.	No. of Palms in Flower.	Percentage of Total.
End of 5th year	30	13.3
End of 6th year	184	63.0
End of 7th year	272	93.1
End of 8th year	291	99.6

Setting of nuts commenced in the 5th year after transplantation and the first ripe nuts were picked in the 6th year. A summary yield statement is given below:—

Period after Transplantation.	Year.	No. of Palms in Bearing.	Percentage of total number (292).	No. of Nuts.	Average Number of nuts. per palm.	Average number of nuts per acre.
6th year ..	1940 ..	20 ..	6.8 ..	191 ..	9.5 ..	36
7th year ..	1941 ..	159 ..	54.4 ..	2,440 ..	15.3 ..	460
8th year ..	1942 ..	247 ..	84.6 ..	11,320 ..	45.8 ..	2,136
9th year ..	1943 ..	288 ..	98.6 ..	14,880 ..	51.7 ..	2,807

The individual performance of palms in relation to yield from the 6th to the 9th years after transplantation is given in the following frequency distributions.

Number of Nuts.	Number of Palms within the limits stated.			
	6th year 1940.	7th year 1941.	8th year 1942.	9th year 1943.
0—	14	64	41	19
10—	2	43	21	13
20—	3	31	30	21
30—	—	11	23	27
40—	1	7	31	42
50—	—	3	36	45
60—	—	—	22	59
70—	—	—	20	31
80—	—	—	12	19
90—	—	—	6	6
100—	—	—	5	6
Total ..	20	159	247	288

By the end of the 8th year after transplantation all the palms had flowered except one supply put in later, and 99 per cent. were in bearing in the 9th year, yielding an average of 52 nuts per palm and 2,807 nuts per acre. Furthermore, it is seen that in that year, 121 palms or 42 per cent. of the bearing palms yielded over 60 nuts and 12 palms above 90 nuts, 6 of which latter yielded over 100 nuts. These must be regarded as very satisfactory yields for a 9-year old plantation. The yield-curve is, of course, still on the up-grade.

(c) *Experimental Plantation II.*—A small area of cleared scrub-jungle, attached to Plantation I. described above, was placed at our disposal towards the latter part of 1941; and it was decided that this should be utilized for a preliminary experiment designed to throw some light on the question whether, in view of the possible acclimatization of palms to restricted environments and the development of what are known as ecotypes, planting material for particular areas with their own peculiar conditions of soil and climate should not be derived from the same areas. General observations of various investigators throughout many years have shown no such restriction attendant on the propagation of the palm, but experimental evidence, either way, has been lacking. This experiment was, therefore, designed to compare the performance of planting material derived from palms growing (a) in an estate 33 miles away from the experimental block, with a soil-type which was a sandy-loam overlying gravel and cabook, (b) within the estate to which the experimental block was attached, the soil of which was a sandy-loam of considerable depth and (c) in an estate situated 30 miles away from the experimental block, the soil-type of which was a clay-loam overlying clay. Seednuts were derived from the 7 best yielding palms on these three estates, on which yield records had been kept for at least 8 years.

The lay-out of the experiment is a simple randomization of the three types of seed-nuts, forming three plots per block, with seven replications to cover the land. Each plot contains sixteen plant-sites.

Owing to lateness in getting the land ready for planting and in our obtaining access to it, it was found that it would be unsafe to transplant seedlings and, therefore, seednuts were put down at stake.

All sites were planted by July, 1942, and the seednuts were put down at a depth of about 3 inches below ground level, acting on a suggestion made by an experienced planter that that would minimise removal of nuts by wild pig. At a survival-count made in December, 1942, it was found that the planter's theory appeared to be correct and that out of a total of 356 nuts only one had been carried off by wild pig, but, at the same time, it was observed that 158 nuts or 47 per cent. of the total number had been destroyed by white ants, in the very large majority of cases after germination. As between the three classes of seednuts, those derived from the estate in which the plantation was, showed 6 to 10 per cent. more damage due to this cause than seednuts from the other two estates. The significance of this result has not yet been established but, at any rate, it is not in favour of the "acclimatized" type.

It was conjectured that such extensive damage by white ants was perhaps, related to the unusual depth of planting on a soil heavily infested by the pest and, in putting down 124 seednuts as supplies in vacant sites, they were planted on the surface with about half of each nut exposed. A survival-count taken at the beginning of this year showed that 45 germinated nuts had been destroyed by white ants or about 19 per cent. less than the losses occasioned by deeper planting.

appears, therefore, that seedlings have a better chance of survival on soils where there are white ants when nuts are planted on the surface than at a greater depth. On the whole, however, it may be wise not to plant nuts at stake on such soils or, if it is necessary to do so owing to a desire not to miss a whole twelvemonth in starting off a plantation, to take the precaution of treating the seed-holes with a soil fumigant 3½ to 4 months after the nuts have been put down at stake, that is to say, at about the time when the sprouts are due to appear through the husks. The further supplying of vacancies in this particular experimental plantation will be done with seedlings and not seednuts at stake. A summary of the results of the survival-counts referred to above are given in the following Table:—

Type of nuts (see para. c (i) above).	Number of nuts planted 3 to 4 inches below ground level.	Number dead.	Percent- age.	Number of nuts planted on the surface.	Number dead.	Percent- age.
a ..	112 ..	47 ..	42.0 ..	42 ..	17 ..	40.5
b ..	112 ..	59 ..	52.7 ..	41 ..	14 ..	34.1
c ..	112 ..	52 ..	46.4 ..	41 ..	11 ..	34.1
Total ..	336	158	47.0	124	45	36.3

This plantation suffered some set-back during 1943 by reason of its extremely weedy condition, which could not be ameliorated until the end of the year owing to the scarcity of labour on the estate to which it was attached.

#### IV. Other Investigations and Reports.

(a) *Estate Management.*—Shortage of transport in 1942 interfered considerably with the free supply of copra to Colombo. This difficulty was not experienced to the same extent in 1943, in which year scarcity of experienced pickers and copra curers became the chief problem. (Compare here A. I (a)).

It was thought that the publication of information on contract rates paid in various districts to pickers and curers might clarify the situation and facilitate the standardization of rates. Such information was obtained from 63 estates comprising some 24,000 acres under the crop summarized and distributed in the form of a detailed memorandum to estate owners, superintendents and others interested in the industry. It was found that there was very little uniformity in the rates paid on estates for picking and curing, both within and between districts, and that this lack of uniformity was much greater with picking than curing rates. It was also made clear that, taking the Island's coconut industry as a whole, picking rates at the time of the enquiry were 34 per cent. higher than in 1942 and 56 per cent. higher than in 1938-41 and that they were expected to rise higher still. Similarly the curing rates were seen to be 75 per cent. higher than in 1938-41 and expected to be more than 90 per cent. higher by the end of the year. A short summary of this report has been included in a joint communication sent by the Director of Research and the Geneticist to the *Ceylon Daily News* on October 27, 1943.

(b) *Food Production.*—A report on Food Production on Coconut Estates in 1942 was issued as a supplement to the report of the Board of Management for the year. This embodies a summary of data on food production, and problems of estate management in relation to the food production, collected during the course of advisory travelling done by the Geneticist and his two Field Assistants to 195 estates in the Western and North-Western Provinces, comprising 36,583 acres under coconuts or 12 per cent. of the total estimated acreage under coconuts in the Island under the estate management as opposed to the acreage in small-holdings. This report will be published separately.

*Estate Visits, &c.*—The Geneticist, his Field Assistants and Nursery Attendants paid 260 visits to co-operating estates and 39 visits to Ratmalagala Estate on yield-recording, advisory work on food production and inspections of experimental plantations.

#### C. Soil Chemist's Department.

I. *Field Experiments.*—Fertilizers were applied to and cultivation carried out on five of the seven major field experiments. The Fodder Grass experiment was terminated at the end of the year.

(i) *NPK Experiment, Bandirippuwa Estate.*—The fifth biennial manuring of this experiment was carried out in November-December, except for the twelve plots receiving nitrogen in the form of cyanamide. Supplies of cyanamide were not received until the beginning of 1944, when this manuring was completed. (See A. Section V b).

The eighth year since the first application of fertilizers in 1935 was completed in November. 1943 results are similar to those of the previous year, the main features being as follows:—

- As in previous years, applications of phosphoric acid have given no increase in yield.
- The response to potash was slightly less than in the previous year, an increase of 18 per cent. being produced by  $K_2$  highly significant— $P .01$ —(as against 23 per cent. in 1942), and 24 per cent. by  $K_3$  (as against 31 per cent. in 1942). Increase of  $K_3$  over  $K_1$  was not significant.
- Nitrogen at the first level produced an increase similar to those in the five previous years 1938-1942. This increase was not significant even at  $P .05$ .  $N_2$ , as during these same years, depressed the increase.

The actual yield records for 1943 are summarised below:—

Treatment.	No. of Plots.	Total Yield (Copra in lbs.)	Copra (lbs.) per Plot (18 trees).	Copra (lbs.) per acre of 60 trees.	Increase.
$K_0$	18	8,331	463	1,542	—
$K_1 = 0.75$ lb. $K_2O$ per palm in 2 years	18	9,816	545	1,816	17.8
$K_2 = 1.50$ lb. $K_2O$ per palm in 2 years	18	10,336	574	1,913	24.1
$N_0$	18	9,279	516	1,720	—
$N_1 = 0.50$ lb. N per palm in 2 years	18	9,831	546	1,820	5.9
$N_2 = 1.00$ lb. N per palm in 2 years	18	9,373	521	1,738	1.0
$P_0$	18	9,693	539	1,796	—
$P_1 = 1.00$ lb. $P_2O_5$ per palm in 2 years	18	9,331	518	1,726	—
$P_2 = 2.00$ lb. $P_2O_5$ per palm in 2 years	18	9,459	526	1,753	-3.7
General average	54	28,483	527	1,756	-2.4
Significant Difference	—	783	40.7	138	—

- (d) In the plots where no potash has been applied during the last eight years, the potash deficiency symptoms are distinctly shown in the foliage and the crown.
- (e) In last year's report, figures for the uptake of potash in coconut water were shown to confirm the negative interaction of P with K. Similar data for the uptake of potash by husks given below, show a corresponding depression in the uptake of potash as a result of the application of high doses of phosphoric acid, especially in those plots to which no addition of potash was made.

$P_2O_5$  Effect on Recovery of Potash (Gms.) by Coconut Husk.

No. of Plots.	Treatment.	M III.	M IV.
4	$P_0K_0$	5,949	6,468
4	$P_2K_0$	4,039	4,495
	% Depression	32.1	30.5
4	$P_0K_2$	6,594	10,676
4	$P_2K_2$	7,734	9,352
	% Depression	19.4	12.3

(ii) Co-operative Experiments.—Four Co-operative manual experiments were in progress during 1943.

(a) Southern Province, Abangama.—The fourth year of this experiment was completed in April, 1943.

The following Table summarises the results of four years:—

Treatment.	M I (1939-40)			M II (1940-41)			M III (1941-42)			M IV (1942-43)		
	lb. Copra per acre.	%	Copra out-turn.	lb. Copra per acre.	%	Copra out-turn.	lb. Copra per acre.	%	Copra out-turn.	lb. Copra per acre.	%	Copra out-turn.
O	478	100	1,344	399	100	1,228	408	100	1,264	508	100	1,729
NK	490	103	1,366	562	138	1,567	809	199	1,925	744	148	1,977
NPK	553	116	1,529	627	157	1,787	928	228	1,122	1,073	211	1,489
Increase NPK-O	75	16	—	928	110	—	520	125	—	565	111	—

(b) Western Province (Siyane Korale).—The fourth year of this experiment was completed in December, 1943.

The following Table summarises the results of four years:—

Year.	1940.			1941.			1942.			1943.		
	lb. Copra per acre.	%	Copra out-turn.	lb. Copra per acre.	%	Copra out-turn.	lb. Copra per acre.	%	Copra out-turn.	lb. Copra per acre.	%	Copra out-turn.
O	346	100	1,569	166	100	1,465	343	100	1,324	233	100	1,372
NK	221	90	1,530	237	143	1,500	491	143	1,404	318	136	1,486
NPK	228	83	1,503	268	155	1,270	609	201	1,336	672	288	1,438
Increase NPK-O	-18	-17	—	92	55	—	266	104	—	439	188	—

The results of these experiments may be jointly considered for purposes of comparison and the following points become apparent:—

- (i.) The response to manuring takes place earlier in the Southern Province experiment than in the other. This may be due to the fact that the palms to start with were more backward in the latter, so that, the first effect of manures was to improve the vegetative growth of the palms before nuts were produced.
- (ii.) In both experiments phosphoric acid gives a marked response. While in the S. P. experiment the effect of phosphoric acid is less marked after the third year, it produces a considerable increase even in the fourth year of the W. P. experiment.

It may be mentioned that in contrast to the soils of the NPK experiment at Bandirippuwa, the soils of the two experiments under discussion, contained mere traces of available phosphoric acid at the commencement.

- (iii.) Whereas in the good soil at Bandirippuwa the increment due to manuring after a period of eight years is only 273 lb. copra per acre, increases of 565 lb. and 439 lb. per annum are produced on the poor soils of the S. P. & W. P. experiments. Even under present prices manuring would be economic for the poor soils though possibly not for the good soils.
- (iv.) Improvement of copra outturns due to manuring has been maintained in both experiments.

(c) *Manurial Experiment on Young Palms (Nattandiya).*—Manures were applied in December at the rates of 1 lb. each of Sulphate of ammonia, Saphos phosphate and Muriate of potash (60 per cent.) for the NPK plots and the same without Saphos for NK plots.

Height measurements were taken in November, 1943.

The mean height measurements per palm for each of the treatments are summarised below (in ft.) :—

Treatment.	O.	NK.	NPK.	Cover + O	Cover + NK	Cover + NPK.
November, 1943	14.2	15.4	15.7	13.9	14.2	15.8
October, 1940	4.6	4.5	4.4	4.8	4.5	4.9
Increase in height during three years	9.6	10.9	11.3	9.1	9.7	10.9

Seedlings treated with a complete mixture have shown the best rate of growth as judged by height measurements.

(d) *Fodder Grass Experiment (Lunuwila).*—This experiment which was commenced in December 1939, was closed down in December, 1943.

The following conclusions are summarised from the records for the year available up to September, 1943 :—

- (i.) When no manures were applied the growing of fodder grass between palms depressed the yield of copra by 39 per cent.
- (ii.) Heavy application of nitrogen produced a slight setback of 10 per cent. in the no-fodder plots. On the contrary the application of this dose of nitrogen to the fodder plots brought about an increase of copra of 44 per cent. over the fodder plots to which no manures were applied. This may be due to the fact that the excess N is taken up by the growing fodder and a setback thereby prevented.
- (iii.) In the no-fodder plots NPK produced an increase of yield of 38 per cent. over the unmanured plots; and a corresponding increase of yield of 59 per cent. in the fodder plots.
- (iv.) Growth of fodder was poor and only 3 cuttings were obtained during the year: manuring with NPK increased the yield of grass eightfold.

(III) *NPK × Cultivation Experiment (Rattalagura).*—This experiment consists of a 3 × 2 × 2 design in six blocks of six plots, object of which is to compare the effect of all possible combinations of three levels of potash (O; K<sub>1</sub> = 1 lb. K<sub>2</sub>O; K<sub>2</sub> = 2 lb. K<sub>2</sub>O); two levels of phosphoric acid (O; P<sub>1</sub> = 1 lb. P<sub>2</sub>O<sub>5</sub>); and two levels of cultivation (no ploughing or ploughing). A the plots were given a basic dose of 0.6 lb. Nitrogen in the form of Sulphate of ammonia.

Premanurial records were kept for one year and manures were applied in June, 1943.

Soil samples were taken before manuring. It is too early to report any results from this experiment.

(IV) *Cover Crop Experiment: Bandirippuwa.*—The mean plot yields of six years corresponding to each treatment, statistically analysed and corrected by Sander's method are given below :—

Treatment.	GI 1937-38	GII 1938-39.	GIII 1939-40.	GIV 1940-41.	GV 1941-42.	GVI 1942-43.
No. Cover + NPK	427	383	323	373	383	538
Cover + K	487	329	170	345	323	511
.. + NK	455	327	213	365	317	516
.. + PK	530	325	172	332	292	494
.. + NP	480	336	201	307	312	441
.. + NPK	443	338	226	372	346	553
Standard Error		28.9	22.2	24.9	47.5	47.3
Significant Difference P.05		34.4	26.4	29.7	56.4	56.2

cannot to lb/acre.

It may be mentioned that covers were planted in June, 1937, turned in for the first time with different manures in June, 1939, and subsequently every two years. The following points are of interest—

- (a) The growth of the cover crop produced a sharp decline of yield which reached a peak in the third year.
- (b) The incorporation of covers along with manures at the end of second year caused a recovery in the cover plots in the fourth year. This recovery has been maintained during subsequent years.
- (c) When manured with a complete mixture (NPK), coconut palms did not significantly benefit by the growth of a cover crop.
- (d) There is no significant difference between the yields produced by the addition of K, NPK and NPK when cover is grown and turned in.
- (e) Absence of potash produced a significant drop in yield when cover is incorporated.

II. *Laboratory investigations.*—Less laboratory work was done in the course of the year owing to the resignation of the Technical Assistant. (See A v).

(I.) *Available phosphoric acid studies.*—In last year's report figures were given to show the accumulation of phosphoric acid in the top soil of manure circles of the NPK Experiment where 2 lb.  $P_2O_5$  per palm had been applied in 1935, 1937 and 1939. Seven sub-soil samples taken at the same time in 1940 were found to contain only 37 p.p.m. available phosphoric acid compared to 650 p.p.m. in the top soils, showing very little penetration of this constituent into the lower layer.

Six samples taken in 1941 from the manure circles of the experiment in Siyane korale before the second biennial manuring were analysed for available total phosphate. Where no  $P_2O_5$  had been applied available phosphoric acid was only a trace, and the total phosphoric acid 300 p.p.m. The available phosphoric acid had risen to 56 p.p.m. where one application of phosphoric acid was made in 1939.

(ii.) *Studies in the Chemistry of Cattle Manuring. (Buffalo Manure).*—Daily records of the dung and urine voided by a pair of buffaloes were kept for a period of 10 days. The amount of nitrogen and potash in the urine were determined and samples of the dried dung kept for analysis.

A pair of buffaloes tied for 10 days voided 5.14 gallons of urine, containing a total nitrogen content of 0.32 lb. and potash 0.86 lb.

During this period 450 lb. dung were voided containing an average moisture content of 81 per cent.

These analyses when completed will serve as a useful guide in determining the supplementary manures that should be economically added when palms are manured by tethering cattle.

(iii.) *Estate Visits.*—A few visits were paid in connection with advisory work on food production. Several visits were paid in connection with the co-operative experiments.

5. (i.) *Publications :*

Report and Accounts of the Coconut Research Scheme for 1944. Ceylon Government Sessional Paper V.—1944. March 7, 1944.

W. V. D. Pieris : " Food Production Work by the Coconut Research Scheme ". Supplement to Sessional Paper V.—1944. August 1, 1944.

R. Child and W. R. N. Nathanael : " Hydnocarpus Oils in Ceylon Part II ". *Tropical Agriculturist* (Ceylon), Vol. XCIX No. 3 (July-Sept.), pp. 140-142.

R. Child and W. R. N. Nathanael : " Note on the Berberine Content of *Coccoloba fenestrata* (Colebr.). *Current Science*, 1943, (Sept.) 12, 255-256.

R. Child and W. R. N. Nathanael : " Ceylon Estate Copra. Part II. No. 2 and No. 3 Grades of Copra ". *Tropical Agriculturist* (Ceylon) 1943, XCIX, 203-206.

R. Child and W. R. N. Nathanael : " A Note on the Fatty Acids of Margosa (Neem) Oil ". *Journ. Ind. Chem. Soc.*, 1944, 21, 35-7.

R. Child : " Coconut Shells as an Industrial Raw Material. I. Composition of Shells ". *Current Science*, 1943, 12, 292-294.

R. Child : " Coconut Shells as an Industrial Raw Material. II. Miscellaneous Uses: *Ibid.* 1944, 13, 4-6.

A Roneotype Memorandum by W. V. D. Pieris on " Contract Rates for Picking Palms and Curing Copra " (pp. 12—XVII Tables) was circulated to correspondents in August. A summary of this memorandum was included in a joint article by R. Child and W. V. D. Pieris, " The Cost of Production of Copra in Ceylon ", which appeared in the *Ceylon Daily News* of October 27, 1943.

(ii.) *Library.*—On December 31, 1943, the Library contained 605 books and 1027 bound volumes of periodicals (including 122 loaned by the Director of Research). *The Madras Agricultural Journal* was added to the list of periodicals received.

Most gaps caused by earlier losses of journals in transit were made good during the year. The usual grateful acknowledgment is here made to Government Departments and Research Institutes overseas which continue to send exchange publications.

Visitors are welcome to use the Library on working days between 9 A.M. and 12 noon and 2 to 4 P.M. (Saturdays 9 A.M. to 12 noon only).

6. (i.) *Lectures :*

The Director of Research gave talks on the coconut palm and its products to audiences of servicemen on January 30 and October 28.

A talk on "Drugs and the War" was broadcast from the Colombo station on July 30, being one of a series arranged by the Department of Information under the general title "Design for Victory".

(ii.) Meetings.

The Director of Research attended the meeting of the Central Board of Agriculture held at Peradeniya on July 25 as an *ex-officio* member.

The Director of Research or the Geneticist on his behalf attended three meetings of the Kurunegala Planters' Association, four meetings of the Chilaw Planters' Association (two of which were adjourned for lack of a quorum) and two meetings of the Coconut Planters' Joint Committee.

With the consent of the Board of Management, the Geneticist was co-opted as a member of the Divisional Agricultural Association, Pitigal Korale South.

The Director of Research attended four meetings of the Co-ordinating Committee on Local Production of Drugs.

(iii.) Visitors.—The Senior Students of the School of Agriculture, Peradeniya, accompanied by the Principal, Mr. C. N. E. J. de Mel, visited the Scheme's headquarters as well as Ratmalagala Estate on two occasions—4th March and 16th December.

THE ESTATES.

7. Bandirippuwa Estate :

The financial statements are presented in the usual form, research expenditure being distinguished from normal estate expenditure.

The crops harvested in 1943 were as follows :—

Crop No.	Nuts from Blocks under Estate Management.	Nuts from Blocks Under Research Management.	Total 1943.	Average for 12 years 1931-1942.	1943. Above or Below Average Per cent.
1 ..	64,693	20,317	85,010	67,054	+26.8
2 ..	97,027	26,997	124,024	109,025	+13.8
3 ..	126,697	42,207	168,904	129,886	+30.0
4 ..	94,253	34,025	128,278	113,776	+12.7
5 ..	76,970	23,742	100,712	75,246	+33.8
6 ..	37,509	12,856	50,365	62,691	-19.7
Total ..	497,149	160,144	657,293	557,678	+17.9

The third crop was the highest single crop on record and the total for the year fell short of the 1937 record crop of 664,742 nuts by only 7,449. The average total crop for the three years 1941-1943 has been 615,620 nuts or approximately, 4,200 nuts per acre.

The revenue from Bandirippuwa estate which actually accrued in 1943 was :—

Revenue from Estate Management.			Revenue from Research Management.		
	Rs.	c.		Rs.	c.
5th crop 1942 copra	2,078	6	5th crop, 1942, copra	10	57
6th crop 1942 copra	1,518	1	6th crop, 1942, copra	700	32
					710 89
<b>Crops 1-5 1943—</b>			<b>Crop 1-5, 1943.</b>		
Sale of copra	7,757	11	Sale of copra from experiments	2,811	50
Sale of nuts	11,498	33	Sale of nuts	2,298	83
Sale of husks and shells	75	33			5,110 33
Sundries	88	65	Seednuts to nursery account 4,789 at 6 cents	287	34
Sale of food crops	825	21			
Seednuts to nursery account 37,000 at 5 cents	1,850	0			
	25,690	70			6,108 66

Total gross revenue in 1943 was thus Rs. 31,799.26, which may be summarised as follows :—

	Rs.	c.	Average Price.
Sale of 65 tons 12 cwt. 39 lb. copra realising	14,875	57	Rs. 55.65 per candy
Sale of 329,644 nuts realising	13,797	16	Rs. 41.85 per 1,000 nuts
Sale of 11,845 husks realising	56	28	Rs. 4.75 per 1,000 nuts
Sale of 19,000 shells realising	19	5	Rs. 1.0 per 1,000 nuts
Sundries	88	65	
Sale of food crops	825	21	
Seednuts to nursery account	2,137	34	
	31,799	26	

Expenditure for the year totalled Rs. 8,927.58 for the estate area, Rs. 4,638.73 for the Research area, and Rs. 442.07 on growing food crops. Estate receipts, therefore, exceeded expenditure by Rs. 15,937.91 and Research receipts exceeded expenditure by Rs. 1,469.83, whilst there was a favourable margin of Rs. 383.14 on food crops.

Cost of production of nuts on the estate area (including copra curing and transport expenses, and depreciation on copra kiln) was Rs. 17.96 per 1,000 nuts.

#### SUNDRY DEBTORS AND CREDITORS ACCOUNT.

Of the income actually accruing in 1943 and included in the above statement, Rs. 3,596.07 (Estate) and Rs. 710.89 (Research) from 1942 crops, had been credited to the Estate Working Account for 1942 through Sundry Debtors Account. The Estate Working Account for 1943 does not, therefore, include these sums.

The following amounts have been credited to the Estate Working Account (see page 20 on account of 6th crop lying unsold at the end of the year) :—

1943 6th crop Estate	..	1,219 65
1943 6th crop Research	..	506 79
		1,726 44

The Bandirippuwa Estate Working Account for 1943 thus shows a balance carried forward to Revenue of Rs. 15,210.36.

*Meteorological Observations at Bandirippuwa Estate.*—The usual records have been kept, and daily telegrams and monthly abstracts sent to the Colombo Observatory. Rainfall in 1943 totalled 65.06 inches, falling on 160 rainy days; wet days (rainfall 0.04 inches or more) numbered 130. The corresponding figures for 1942 were 69.37 inches falling on 152 rainy days (wet days 119).

Although the total rainfall for the year was below average, distribution was fairly satisfactory and the N.E. monsoon rains were favourable; in October and November 27.39 inches fell on 44 rainy days (40 wet days).

*Roads and Estate Buildings.*—Estate roads were maintained. A mud and wattle store building was erected near the No. 1 nursery. The copra store was whitewashed, and timber painted with preservative; and a new window put in.

The estate store and battery room were whitewashed, and all doors and windows painted.

8. *Ratmalayara Estate.*—Crops harvested in 1943 were as follows, with 1938-1942 crops for comparison, i.e. all since the acquisition of the Estate :—

Crop No.	1938.	1939.	1940.	1941.	1942.	1943.	Average 1938-43.
1 ..	30,896*	23,762 ..	22,302 ..	29,153 ..	21,718 ..	25,504 ..	25,554
2 ..	23,130 ..	26,413 ..	16,391 ..	33,285 ..	26,478 ..	37,197 ..	28,516
3 ..	37,413 ..	30,160 ..	28,233 ..	49,339 ..	39,218 ..	55,008 ..	39,595
4 ..	44,180 ..	34,278 ..	25,704 ..	60,232 ..	44,584 ..	56,378 ..	44,226
5 ..	34,573 ..	32,515 ..	37,000 ..	45,606 ..	30,205 ..	48,978 ..	39,484
6 ..	20,945 ..	23,865 ..	20,800 ..	29,682 ..	22,958 ..	36,230 ..	25,747
	196,137	170,983	150,430	252,297	194,161	259,295	203,584

The revenue actually accruing during the year was as follows :—

	Rs.	c.	
Sale of 7 tons 18 cwt. 73 lb. copra from 1942 crops	..	1,738	82**
39 .. 5 .. 35 .. " crops 1-5 1943	..	9,112	75
9 .. 19 .. 28 .. " experiments 1942	..	227	15
9 .. 3 .. 81 .. " experiments 1943	..	2,085	24
		15,163	96
57 .. 1 .. 107 ..			
Sale of food crops from estate	..	1,742	66
Food crops ¼ share from share-croppers	..	2,055	40
		3,828	06
Sale of timber and firewood	..	122	90
Sundries (Shells 1942)	..	7	0**
Sundries 1943	..	1	0
		150	90
		17,122	93
Credit for fertilizer stocks	..	581	43
		17,704	41

Expenditure totalled Rs. 8,645.74 on the mature area (including manuring Rs. 842.32); Rs. 1,651.26 on growing food crops and Rs. 2,662.26 research expenses. Cost of production per 1,000 nuts was Rs. 33.34.

Receipts exceeded payments by Rs. 4,745.15.

\* Harvested by previous owner.

## SUNDRY DEBTORS AND CREDITORS ACCOUNT.

To the Ratmalagara Estate Working Account for 1943 had been credited a sum of Rs. 1,745.82 (marked\*\* in above Table), on account of crops unsold at the end of the year.

There has been credited to the Working Account for 1943 a provisional sum of Rs. 1,455 on account of 6th crop unsold at the end of the year, and a sum of Rs. 162.18 being sum due to be refunded by the Department of Agriculture on account of upkeep of citrus nursery. The Estate Working Account (as detailed on page 20) thus shows a balance carried forward to Revenue Account of Rs. 4,646.51.

*Weather Records.*—Records of rainfall and of hours of bright sunshine continue to be kept at Ratmalagara Estate. Record cards from the Campbell-Stokes sunshine recorder (installed in January, 1941) are sent to the Colombo Observatory monthly, together with the rainfall records. In 1943, 55.29 inches of rain fell on 94 rainy days, compared with 64.53 inches on 109 rainy days in 1942. A record fall of 10.89 inches in 24 hours was recorded on October 15-16th.

Hours of bright sunshine averaged 6.7 daily.

*Buildings.*—A mud and wattle house with two rooms, back and front verandahs and outside kitchen was built near the nursery for the use of a resident Nursery Attendant (see here section B).

9. *Visiting.*—Mr. B. Parker, Visiting Agent, visited both estates twice during the year, in May and October, and his reports were circulated to the Board of Management.

10. *Finances.*—The audited statements of accounts, and the report of the Auditor-General on the accounts for 1943 are appended.

February 23, 1944.

E. RODRIGO,  
Acting Director of Agriculture, and  
Chairman, Board of Management,  
Coconut Research Scheme.

Audit Office,  
Wellawatta, June 30, 1944.

THE CHAIRMAN, Board of Management, Coconut Research Scheme, Peradeniya.

The accounts of the Coconut Research Scheme for the year 1943 have been audited, and the following statements of accounts are forwarded duly certified:—

- (1) Statement of Receipts and Disbursements;
- (2) Statements of Working Accounts of the Bandirippuwa and Ratmalagara Estates, and the Nursery;
- (3) Revenue, Nett Revenue, Surplus and Deficit Accounts, and
- (4) Capital Account, and General Balance Sheet as at December 31, 1943.

The Statement of Receipts and Disbursements based on actual receipts and payments during the year is furnished in compliance with the statutory requirement in Section 8 (2) of Ordinance No. 29 of 1928.

## I.—INCOME.

2. The total income for the year amounted to Rs. 119,668. It exceeded the estimate of Rs. 106,244 by Rs. 13,424 and the actual revenue of the previous year by Rs. 32,665.

3. *Grant.*—The annual grant of Rs. 30,000 payable by the Government under Section 6 (1) of Ordinance No. 29 of 1928 has been duly received.

4. *Cess Collections.*—The amount accrued for the year was Rs. 60,011 inclusive of the sum of Rs. 4,946.92 shown under Sundry Debtors in the Balance Sheet. It also includes Rs. 2,461.28 in respect of 1942 received from the Principal Collector of Customs in addition to the sums accounted for last year.

5. *Interest.*—The amount accrued for the year on deposits and investments was Rs. 3,125.

6. *Profits Earned.*—Profits from the working accounts of the Bandirippuwa and Ratmalagara Estates, and the Nursery amounted to Rs. 25,014 as follows:—

	Income. Rs.	Expenditure. Rs.	Profit. Rs.
Bandirippuwa .. ..	29,219	14,009	15,210
Ratmalagara .. ..	17,606	12,959	4,647
Nursery .. ..	10,813	5,656	5,157
			25,014

## II.—EXPENDITURE.

7. The total expenditure on revenue account, the details of which are fully set out in the Revenue Account was Rs. 106,300 exclusive of the depreciation. The expenditure charged to Capital Account was Rs. 2,988.

The following is a comparison between the original estimate and the actual expenditure incurred.

	Estimate. Rs. c.	Actual. Rs. c.	Excess. Rs. c.	Supplementary Rs. c.
<b>8. A.—Capital Account :</b>				
1 (a) New clearings ..	1,500 0	864 29	—	—
2. Equipment of laboratory ..	1,000 0	539 34	—	—
3. Copra Kiln, Ratmalagara Estate ..	—	336 78	336 78	—
4. Furniture ..	—	375 0	375 0	—
5. Accumulators ..	—	308 25	308 25	—
6. Buildings ..	—	563 95	563 93	—
<b>B.—Personal Emoluments :</b>				
Salaries of senior staff ..	37,809 0	37,583 75	—	—
Salaries of junior staff ..	14,165 0	14,246 37	81 37	—
Provident Fund contribution ..	4,675 0	9,156 14	4,481 14	840 0
Rent allowance ..	634 0	510 56	—	—
War allowance ..	3,800 0	4,948 20	1,148 20	1,080 0
<b>C.—Other Charges :</b>				
Travelling expenses staff ..	4,000 0	4,605 86	605 86	—
Travelling expenses board ..	500 0	840 80	340 80	—
<b>D.—Office :</b>				
1. Stationery ..	400 0	1,809 99	1,409 99	900 0
2. Postages ..	500 0	634 2	134 2	—
3. Printing and advertising ..	500 0	450 87	—	—
4. Incidental expenses ..	1,000 0	1,927 30	927 30	500 0
5. Telephone ..	355 0	355 0	—	—
6. Entertainment allowance ..	50 0	52 50	2 50	—
7. Workmen's Compensation Insurance ..	76 0	75 90	—	—
<b>E.—Laboratory :</b>				
Upkeep, chemicals, apparatus and instruments ..	1,000 0	1,527 11	527 11	—
Scientific books and periodicals ..	500 0	743 99	243 99	700 0
<b>F.—Buildings :</b>				
1. Upkeep of buildings ..	1,000 0	1,945 77	945 77	1,000 0
2. Insurance of buildings ..	542 0	539 44	—	—
3. Running expenses of electric plant ..	2,000 0	2,512 10	512 10	500 0
<b>G.—Estate Account—Bar/krippuca :</b>				
1. General charges ..	1,800 0	2,877 86	1,077 86	1,000 0
2. Upkeep and foodcrops ..	2,000 0	1,317 36	—	—
3. Cultivation and manuring ..	1,700 0	1,588 39	—	1,100 0
4. Collection ..	2,500 0	1,558 29	—	—
<b>G.—1—Estate Account—Ratmalagara :</b>				
1. General charges ..	2,000 0	2,433 19	433 19	—
2. Upkeep and food crops ..	2,200 0	2,667 67	467 67	—
3. Cultivation and manuring ..	1,650 0	1,416 3	—	800 0
4. Collection ..	1,000 0	1,650 56	650 56	1,200 0
<b>H.—Research Account :</b>				
1. General ..	500 0	456 91	—	—
2. Genetical work ..	1,500 0	1,850 0	350 0	—
3. Nursery working expenses and purchase of planting materials from co-operating estates ..	3,500 0	3,518 48	18 48	—
4. Soil chemist ..	6,000 0	6,109 27	109 27	—

COCONUT RESEARCH SCHEME.

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	Estimate.	Actual.	Excess.	Supplementary.
	Rs. c.	Rs. c.	Rs. c.	Rs. c.
<i>I.—Loan :</i>				
Loan repayment with interest	6,000 0	26,000 0	20,000 0	—
<i>J.—Reserve for depreciation</i>	.. —	.. 1,472 92	.. 1,472 92	.. —

In this connection I note paragraph 4 (b) of the Minutes of the 65th Meeting of the Board held on December 20, 1943—It is presumed that suitable action will be taken to reduce unauthorised excess on votes to a minimum.

9. The excesses under the various items save the following have been approved by the Board of Management :—

	Rs. c.
A. Copra kiln, Ratmalagara estate	.. 336 78
B. Provident Fund Contribution	.. 4,481 14
War allowance	.. 68 20
Travelling of staff	.. 605 86
Travelling of Board Members	.. 340 80
D. Stationery	.. 509 99
Postage	.. 134 2
Incidental expenses	.. 427 30
Entertainment allowance	.. 2 50
E. Upkeep of chemicals, &c.	.. 527 11
F. Running expenses of electric plant	.. 12 10
G. Bandirippuwa general charges	.. 77 86
G.—1 Ratmalagara : General charges	.. 433 19
Do. Upkeep	.. 467 67
H. Genetical work	.. 350 0
Nursery expenses and purchase of planting materials from co-operating estates	.. 18 48
Soil chemist	.. 169 27
I. Loan	.. 20,000 0

10. The following fresh calls appear to have been made on the funds without authority :—

	Rs. c.
(a) Furniture	.. 375 0
Accumulators	.. 308 25
Buildings	.. 563 93
(b) Depreciation reserve	.. 1,472 92

The covering sanction of the Board is necessary.

III.—SURPLUS.

11. The accumulated surplus at the beginning of the year was Rs. 22,115. The result of the year's working showed a surplus of Rs. 12,225 but as a sum of Rs. 2,988 was utilized on capital works the nett surplus for the year was Rs. 9,237. This brings the surplus at the end of the year to Rs. 31,352.

IV.—BALANCE SHEET.

(a) Liabilities.

12. *Contribution to Capital Outlay, Rs. 551,874.*—This amount represents the total contribution from revenue to Capital Outlay of the Scheme, the year's contribution being Rs. 2,988.

13. *Loan from Government, Rs. 50,000.*—This was obtained in 1937 for the purchase of the Ratmalagara Estate, and was settled in full during the year. The details of the amount repaid appear under the item "Loan Redeemed Account". It is presumed that this amount will be included in the item "Contribution to Capital Outlay" in the next Balance Sheet.

14. *Passage Fund, Reserve, Rs. 695.*—This amount represents the balance lying with the Scheme for meeting the cost of passages of the staff.

15. *Provident Fund, Rs. 32,256.*—This has been floated again in 1943 with the officers' balance contribution of Rs. 2,834 left behind in the Scheme and with the Scheme's contribution of Rs. 4,676 in respect of the year 1942. The officers refunded to the Fund Rs. 16,893 paid out to them in 1942 to wind up the Fund. The Scheme's bonus which is equivalent to the officers' contributions for the year was Rs. 3,835. The interest earned was Rs. 647. After refunds to officers who left the Scheme during the year the total to the credit of the Fund was Rs. 32,286.

16. *Reserve for Depreciation, Rs. 105,189.*—(a) The total credit at the end of 1942 was Rs. 104,361. This reserve has been debited to the extent of Rs. 545 being expenditure on equipments. The practice of tapping depreciation reserve for normal expenditure is not satisfactory.

If such procedure were really necessary the prior sanction of the Board should have been obtained. Further, the Revenue Account has been inflated by the transfer of this amount to that account. It is suggested that the amount be restored to the Depreciation Reserve Account from current revenue. The amount transferred to reserve for the year is Rs. 1,472.92 made up thus:—

	Rs.	c.
Gas plant at 10 per cent. on Rs. 1,198.36	..	119 84
Accumulators at 12½ per cent. on Rs. 8,189.07	..	1,023 63
Copra kiln at 10 per cent. Rs. 3,294.49	..	329 45
		1,472 92

(b) It is observed that no depreciation has been included in the accounts in respect of depreciating assets, such as:—

Buildings,  
Laboratory buildings,  
Laboratory equipment,  
Bungalow furniture,  
Office equipment, and Museum.

and it is suggested that a reasonable percentage of depreciation be transferred to the Depreciation Reserve in respect of each of these items when annual accounts are prepared next.

17. *Creditors, Rs. 220.*—This represents money due to the staff for travelling not claimed within the year.

(b) *Assets.*

18. *Capital Expenditure, Rs. 601,874.*—The details of this expenditure are set forth in the Capital Account. A sum of Rs. 105,189 which is about 17.48 per cent. of the total capital expenditure has been provided for the depreciation of the assets.

19. *Debtors, Rs. 9,314, accrued interest Rs. 499.67, and Advance Accounts, Rs. 2,514.*—The details of these items are shown in the General Balance Sheet.

20. *Investments, Rs. 107,950.*—The total of the investments at the end of 1942 was Rs. 83,592. The investments during the year under review were:—

	Rs.	Rs.
Home Defence Loan	..	15,000
Ceylon Savings Certificates	..	9,359
		24,359

It is observed that the investments are in respect of the funds of the Depreciation Reserve and the Provident Fund. It is considered necessary that the Director indicate separately in future in the Balance Sheet the amounts invested in respect of each account.

21. *Cash Balance, Rs. 49,464.*—(a) Cash in Bank was verified by reference to Bank Certificates and Reconciliation Statements. (b) Cash in hand was not verified at close of business on December 31, 1943, but a surprise verification was made of the cash at Headquarters at Bandirippuwa Estate on May 17, 1944. (c) Ratmalagara Estate has been allowed an Imprest of Rs. 300. Owing to difficulties in travelling to verify this small sum this department checked the officer's weekly return at the Headquarters and rested satisfied with the Director's information in the previous years that he was verifying it at his inspections. But now the Director states that the Superintendent does it and not himself. The Head of the Scheme, is the proper person to carry out this duty.

GENERAL.

22. *Delay of Accounts.*—I have already pointed out, in my letter of May 16, 1944, the inadequacy of the records furnished to this office to facilitate audit. Further I may state that the most important statement under the Ordinance—the Statement of Receipts and Disbursements—was forwarded to this office on the 26th ultimo after it was pointed out to the Director at the recent Audit Inspection. The Bank Certificates which should have accompanied the Annual Accounts were received still later, also at my request.

23. *Delay in replying to Queries.*—Several queries on the accounts for 1941, &c., are remaining unanswered for over two years. A number of reminders—even personal letters—have proved futile.

K. KANAGARATNAM,  
Acting Auditor-General.

COCONUT RESEARCH SCHEME.

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Statement of Receipts and Disbursements for the Year ended December 31, 1943.

RECEIPTS.		DISBURSEMENTS.	
	Rs. c.	Rs. c.	Rs. c.
Balance at January 1, 1943	..	28,853 61	
Annual grant from Government	30,000 0		
Cash collection from Government	63,833 71		
Interest	2,975 70		
Income from Bandirippuwa Estate	31,977 70		
Income from Ratmalagara Estate	15,388 83		
Sale of planting materials	13,886 11		
Charges to staff for electricity	660 58		
Sale of publications	150 14		
Telephone charges	40 0		
Sundry receipts	115 39		
		159,026 96	
Advance Account:			
Repayment of transport loans	556 20		
Tyre advance account	7 78		
Electric bulb advance account	11 35		
Rice, sugar and chillies advance account	1,735 95		
Fertiliser advance account	4,707 93		
		6,819 21	
Deposit Account:			
Staff Contribution to Provident Fund	20,753 86		
Provident Fund	9,137 8		
Reserve for depreciation	1,472 92		
		31,383 86	
Expenditure Account:			
Capital Account: New clearing.			
Ratmalagara Estate	864 29		
Equipment of laboratory	559 34		
Copra drier at Ratmalagara Estate	326 78		
Furniture for bungalows	378 0		
Buildings	563 93		
Accumulators	308 25		
		2,987 59	
Personal Emoluments:			
Salaries of senior staff	37,533 75		
Salaries of junior staff	14,246 37		
Provident Fund contribution and interest 1942	4,674 73		
Provident Fund contribution and interest 1943	4,481 41		
Rent allowance	510 56		
War allowance	4,948 20		
		66,445 2	
Other Charges:			
Travelling expenses of staff	4,605 86		
Travelling expenses of Board Members	840 0		
		5,446 66	
Office Expenses:			
Stationery	1,809 99		
Postages	634 2		
Printing and advertising	450 87		
Incidental expenses	1,927 30		
Telephone	385 0		
Entertainment allowance	52 50		
Workmen's Compensation Insurance	73 90		
		5,306 58	
Laboratory:			
Upkeep, chemicals, &c.	1,527 11		
Scientific books and periodicals	743 00		
		2,271 10	
Buildings:			
Upkeep	1,945 77		
Insurance	539 44		
Running expenses of electric plant	2,612 10		
		4,997 31	
Estate Account Bandirippuwa:			
General charges	2,877 86		
Upkeep	1,317 36		
Cultivation	1,580 39		
Collection	1,558 20		
		7,341 90	
Estate Account Ratmalagara:			
General charges	2,433 19		
Upkeep	1,016 41		
Cultivation	1,416 3		
Collection	1,650 56		
Food crops	1,651 26		
		8,167 45	
Research Account:			
General	456 91		
Genetical expenses	1,850 0		
Nursery working expenses	1,040 99		
Purchase of planting materials from co-operating estates	2,477 49		
Soil Chemist's work	6,169 27		
		11,994 66	
Loan Repayment and Interest	20,000 0		
Reserve for depreciation	1,472 92		
Refund of Provident Fund contribution	453 37		
Advance Account:			
Transport advance to staff	585 0		
Fertiliser advance account	6,216 23		
Rice, sugar, &c., Bandirippuwa Estate	1,992 4		
Electric bulbs	84 0		
		8,877 27	
New Investments:			
Ceylon Home Defence Loan	15,000 0		
Ceylon Savings Certificates	9,358 64		
		24,358 64	
Balance:			
On current account	47,461 17		
Cash in hand	2,000 0		
		49,461 17	
		225,583 64	
			225,583 64

Audit Office,  
Kawatha, June 30, 1944.  
—J. J. A 49125 (3/45)

Audited and found correct:  
K. KANAGARATNAM,  
Acting Auditor-General.

## CEYLON SESSIONAL PAPERS, 1945.

## Bandirippuwa Estate Working Account for the Year ended December 31, 1943.

EXPENDITURE.		Rs.	c.	Rs.	c.	INCOME.		Rs.	c.
To Estate Expenses :						By Sale of Produce :			
Salaries of Superintendent, Conductor and Watchers (part) including War Allowance .. .. .				2,508 0		(a) Estate :			
General charges .. .. .				2,205 10		Nuts (Crops 1-6) .. .. .		10,029 16	
Copra curing and despatch .. .. .				838 19		Nuts (Crop 6, provisional) .. .. .		1,200 0	
Depreciation of Patent Copra Drier .. .. .				320 45		Copra .. .. .		7,776 76	
Upkeep .. .. .				575 29		Sunbirds .. .. .		163 98	
Cultivation .. .. .				28 51		Seed-nuts .. .. .		1,850 0	
Manuring .. .. .				1,559 85		(b) Research :			
Collection .. .. .				670 10		Nuts (Crops 1-5) .. .. .		3,168 0	
Food crops .. .. .				6,559 58		Nuts (Crop 6 provisional) .. .. .		500 0	
				442 7		Copra from experiments .. .. .		2,818 20	
						Seed-nuts .. .. .		287 34	
						Sale of food crops .. .. .		6,770 00	
Research Expenses :									
Salaries of Superintendent, Conductor and Watchers (part) including War Allowance .. .. .				762 80					
General work .. .. .				86 24					
Genetical work .. .. .				1,072 37					
Soil Chemists work .. .. .				2,717 32					
Balance carried forward to Revenue Account .. .. .				3,875 93					
				15,210 36					
				29,218 74				29,218 74	

## Batmalagara Estate Working Account for the Year ended December 31, 1943.

EXPENDITURE.		Rs.	c.	Rs.	c.	INCOME.		Rs.	c.
To Estate Expenses :						By Sale of Produce :			
Salaries of Superintendent, Conductor and Watchers .. .. .				3,398 10		(a) Estate :			
General charges .. .. .				1,256 69		Copra .. .. .		9,145 45	
Copra curing and despatch .. .. .				1,147 62		Cr. for fertilisers in stock .. .. .		581 49	
Upkeep .. .. .				1,018 41		Nuts (Crop 6, prov.) .. .. .		1,260 0	
Cultivation .. .. .				573 70		(b) Research :			
Manuring .. .. .				845 33		Copra from experiments .. .. .		2,270 69	
Collection .. .. .				419 30		Nuts (Crop 6, prov.) .. .. .		225 0	
Food crops .. .. .				5,247 64		(c) Sale of food crops :			
				1,051 28		Estate .. .. .		1,742 66	
To Research expenses :						1/2 share (leased chenas) .. .. .		2,085 40	
General .. .. .				277 4		(d) Sale of timber and firewood .. .. .		1,825 0	
Geneticist's work .. .. .				777 63		(e) Refund from Department of Agriculture :			
Soil Chemist's work .. .. .				1,607 59		Expenses of citrus nursery .. .. .		161 16	
Balance carried forward to revenue .. .. .				2,062 26		Lease-rental rubber seed garden .. .. .		1 0	
				4,446 51					
				17,605 77				17,605 77	

## Nursery Working Account for the Year ended December 31, 1943.

EXPENDITURE.		Rs.	c.	INCOME.		Rs.	c.
Purchase of seed-nuts .. .. .		1,354 24		Revenue from sale of planting material :			
Purchase of seed-nuts from Bandirippuwa Estate .. .. .		2,137 34		Seednuts .. .. .		3,788 3	
Working expenses of nurseries .. .. .		1,050 99		Seedlings .. .. .		5,448 15	
Travelling expenses of Nurserymen .. .. .		673 99				9,286 18	
Transport expenses .. .. .		436 37		Refund of transport expenses, &c. .. .. .		203 26	
Sundry expenses .. .. .		14 85		Sundry debtors .. .. .		1,373 62	
Balance carried forward to Revenue Account .. .. .		5,157 39					
		10,813 21				10,813 21	

COCONUT RESEARCH SCHEME.

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Revenue Account as at December 31, 1943.

Dr.	Rs. c.	Rs. c.	Cr.
<b>To Personal Emoluments:</b>			Rs. c.
Salaries of senior staff ..	87,583 75		By Government grant ..
Salaries of junior staff ..	10,394 77		.. 30,000 0
Provident Fund Contribution ..			Cms collections ..
and Interest— 1942 ..	4,074 73		.. 60,011 2
1943 ..	4,482 35		Interest ..
Rent allowance ..	510 56		.. 3,125 10
War allowance ..	4,177 10		Charges to staff for electricity ..
		61,763 26	.. 665 53
			Telephone charges ..
			.. 40 0
			Sale of publications ..
			.. 150 14
			Sundry receipts ..
			.. 115 39
			Balance from Bandirippuwa Estate Working Account ..
			.. 15,210 36
			Balance from Ratmalagara Estate Working Account ..
			.. 4,646 51
			Balance from Nursery Working Account ..
			.. 5,157 39
			Refunds to Revenue from Provident Fund Reserve ..
			.. 0 56
			Refund to Revenue from Depreciation Reserve ..
			.. 545 24
<b>Other Charges:</b>			
Travelling: Staff ..	4,500 47		
Board Members ..	840 80		
		5,341 27	
<b>Office:</b>			
Stationery ..	1,509 90		
Postages ..	697 52		
Printing and advertising ..	405 87		
Incidental expenses ..	1,027 30		
Telephone ..	355 0		
Entertainment allowance ..	52 50		
Workmen's Compensation ..			
Insurance ..	75 00		
		5,234 8	
<b>Laboratory:</b>			
Upkeep, chemicals, &c. ..	1,394 81		
Scientific books and periodicals ..	743 99		
		2,138 80	
<b>Buildings:</b>			
Upkeep ..	1,945 77		
Insurance ..	559 44		
Running expenses of electric plant ..	2,468 10		
		4,973 31	
Research I. ..		93 63	
Research III. ..		1,844 36	
Depreciation ..		1,143 47	
Repayment of loan and interest ..		24,931 51	
Excess Receipts over payments ..		12,224 74	
		119,668 43	119,668 43

Net Revenue Account for 1943.

Rs. c.	Rs. c.	Rs. c.
Contribution to Capital Outlay ..	2,987 59	By balance brought forward from Revenue Account ..
Surplus for the year carried forward to Surplus and Deficit Account ..	9,237 15	.. 12,224 74
	12,224 74	12,224 74

Surplus & Deficit Account for 1943.

Rs. c.	Rs. c.	Rs. c.
Balance at December 31, 1942 ..	31,352 8	Balance at December 31, 1943 ..
		Surplus brought forward from Net Revenue Account ..
		.. 9,237 15
	31,352 8	31,352 8

## Capital Account as at December 31, 1943.

EXPENDITURE.	To December		Total.	RECEIPTS.	
	31, 1942.	1943.		Rs. c.	Rs. c.
To Land Acquisition:					
Purchase of Bandirippuwa	187,554 68..	—	187,554 68	By Revenue contributions to Capital Outlay	Rs. 651,873 81
Purchase of Ratmalagara	73,138 0..	—	73,138 0	Loan from Government of Ceylon	60,000 0
Improvement of Ratmalagara	6,408 7..	864 29..	7,272 56		
Buildings	203,310 10..	563 93..	203,874 3		
Copra Kiln at Bandirippuwa	4,067 26..	—	4,067 26		
Copra Kiln at Ratmalagara	1,096 13..	336 78..	1,432 91		
Laboratory structures	64,297 31..	—	64,297 31		
Laboratory equipment	31,393 12..	539 34..	31,932 46		
Gas plant	3,436 83..	—	3,436 83		
Furniture for bungalows	4,573 44..	375 0..	4,948 44		
Office furniture and equipment	2,139 72..	—	2,139 72		
Accumulators	17,195 36..	308 25..	17,503 61		
Museum	276 20..	—	276 20		
	<u>598,888 22</u>	<u>2,087 59</u>	<u>601,873 81</u>		<u>601,873 81</u>

## General Balance Sheet as at December 31, 1943.

LIABILITIES.		Rs. c.	Rs. c.	ASSETS.	
Contribution to Capital Outlay				Capital expenditure	Rs. c. 601,873 81
Loan from Ceylon Government on December 31, 1942		25,000 0		Debtors:	
Less Repayment in 1943		25,000 0		Cess Collections for December, 1943	4,846 92
Loan Redeemed Account at December 31, 1943		25,000 0		Bandirippuwa Estate Working Account	1,726 44
Amount paid in 1943		25,000 0		Ratmalagara Estate Working Account	1,647 18
Passage Fund Reserve		50,000 0		Nursery Working account	1,293 65
Provident Fund	Rs. c.	695 11		Sundries	—
At December 31, 1943				Accrued Interest:	9,314 19
Receipts during 1943	2,834 24			Ceylon Government Loan	262 50
Less refunds during 1943	29,911 32			Ceylon Savings Bank	180 0
		32,745 56		Home Defence Loan	40 50
Depreciation Reserve:		32,286 5		Savings Deposit Account	16 67
At December 31, 1942				Advance Accounts:	492 87
Less Refund 1943	104,266 83			Fertiliser Advance Account	1,508 30
Add reserve 1943	545 24			Rice, sugar, &c.	185 44
		103,715 59		Loan to staff for purchase of transport	847 30
Creditors:		105,188 51		Bulb Advance Account	72 65
T. H. S. Perera Travelling	5 0			Investments:	2,513 38
Surplus	215 25			Ceylon Government 5½ per cent. loan 1957/62	59,400 0
		220 25		Home Defence Loan	5,000 0
		31,352 3		Do. ..	5,000 0
				Do. ..	5,000 0
				Ceylon Savings Bank	5,000 0
				Ceylon Savings Certificates	17,550 38
				Bank of Ceylon Savings Account	10,000 0
				Cash:	107,940 23
				Current Accounts	47,464 17
				In hand	2,000 0
					<u>48,464 17</u>
					<u>771,615 76</u>

In accordance with the provisions of section 8 (2) of the Coconut Research Ordinance (Cap. 303), I have examined the above Balance Sheet. I have obtained all the information and explanations that I have required and I certify, as the result of my audit, that in my opinion the above Balance Sheet correctly sets forth the state of affairs at December 31, 1943. My report dated June 30, 1944, on the above Balance Sheet and Accounts is annexed hereto.

Audit Office,  
Wellawatta, June 30, 1944.

K. KANAGARATNAM,  
Acting Auditor-General.