INTENSIVE SURVEY OF THE COCOA-PRODUCING AREAS OF THE GOLD COAST

and

TRENDS IN POTENTIAL PRODUCTION.

By

ELIZABETH TANBURN, M.B.E.
M.Sc.; B.A.; F.S.S.
Agricultural Statistician,
Department of Agriculture.
ACCRA.
Gold Coast.

December, 1955.

INTENSIVE SURVEY OF THE COCOA PRODUCING AREAS OF THE GOLD COAST, and TRENDS IN POTENTIAL PRODUCTION.

c o n t e n t s

PART IV. APPENDICES (continued). page

- - - - - - -

FIGS.

TABLES.

INTENSIVE SURVEY OF THE COCOA PRODUCING AREAS OF THE GOLD COAST, and TRENDS IN POTENTIAL PRODUCTION.

PART I. GENERAL.

1. Introduction.

1.1. The importance of cocoa in the economy of the Gold Coast, and the threatened consequences of the killing swollen shoot disease, are too well known to require further description here. These matters were touched upon in an earlier report (1), when a preliminary investigation was carried out to see what additional use could be made of the vast masses of data collected by the Cocoa Division of the Gold Coast Department of Agriculture during their routine work of locating and treating outbreaks of Swollen Shoot.

1.2. This investigation resulted in a new post being created for an Agricultural Statistician to work under the direction of the Government Statistician in consultation with the Director of Agriculture; the post was first filled in June, 1954. First priority was given to the study of future trends of cocoa production.

1.3. Two aspects of cocoa production are treated in this report. The first is a theoretical study of how production is affected by different patterns of planting at different dates, taking into account the drastic decline in planting which occurred during World War II. The second is an analysis of the Cocoa Survey data.

1.4. For the latter, all Intensive Survey data collected since the inauguration of the Cocoa Division was transferred to the Government Statistician's punch card system, a process which was a vaster operation than at first envisaged. Not only did it prove difficult to check the data punched on the cards, but some of the earlier cocoa records were very inferior in quality and required considerable adjustment before they could be transferred to punch cards. Head Office records were found to be incomplete, and the delays in obtaining some of the missing data from areas were such that it could not be included in the final summary which only covers records actually in Head Office at the end of September, 1955.

1.5. Inevitably difficulties arise when using data for purposes other than those for which it was planned. Cocoa Survey Officers in some areas devoted their entire attention to locating and treating diseased cocoa, and omitted to collect or record data on general land utilisation. It is not possible to estimate for such incomplete data, as it is not consistently confined to definite localised areas, due to the re-posting of staff each tour.

1.6. Nevertheless, the mass of data collected is such that every possible use should be made of it despite inaccuracies. There is no better source, and no other data as complete, on land utilisation in the Gold Coast, and the use of mechanised tabulation has resulted in a more thorough summary of Intensive Survey data than had previously been possible. It is hoped in due course to treat Re-survey in a similar manner.

---

(1) REPORT ON COCOA IN THE GOLD COAST - THE COCOA SURVEY AND SWOLLEN SHOOT CAMPAIGN. Tanburn, 1953.

1.7. Estimates were made for areas where survey data was not available; if it was known that cocoa was unlikely to be found, such as in Forest Reserves or savannah, the area was measured or estimated from a large-scale map and added to bush or forest; where the outstanding area was potential cocoa land, it was measured and distributed among the various categories in the same proportions found in the available data. This will result in underestimation of food farms additional to that caused by inferior quality records.

1.8. This detailed examination of all Intensive Survey records, together with the estimating for missing data, added very considerably to the volume of work, and it was not possible to complete it in a single tour. This report should therefore not be considered as final, and in due course the results and deductions may require amendment.

2. General Crop Estimation.

2.1. For the benefit of readers who are not accustomed to the methods of crop estimation, it may be of assistance to include a few general comments on the subject.

2.2. Differences in seasonal conditions cause a peak production for most crops at some period of the year. For this reason it is usual to assess production during a season, rather than during a calendar year.

2.3. Fairly accurate estimates of production can usually be obtained in retrospect from utilisation or movement figures. This is particularly so in the case of cash crops which pass through some bottleneck, such as shipment, processing plants, or buying centres. Inaccuracies will result from any incentive to avoid the bottleneck such as a black market price or illicit use of the commodity. Difficulties may occur in relating utilisation figures, which are likely to be for calendar months, with seasonal production, as there will be a time-lag between harvesting and the physical movement of the crop, or the point at which movement is recorded.

2.4. For planning and administrative purposes it is essential to have a very good idea of seasonal production before final retrospective figures become available, and usually before harvesting is completed or even commenced. Such crop forecasts are usually obtained by assessing the acreage under the crop, and applying a factor for yield per acre. This yield is estimated by combining local specialised knowledge of the current seasonal effect, and the yield obtained under "normal" conditions, the latter being assessed from the final retrospective figures of preceding years.

3. Cocoa Production.

3.1. Potential cocoa production, defined as the quantity actually produced on cocoa trees in the Gold Coast, is dependent on two main factors. The first and most important is the acreage of cocoa, with special reference to the age-distribution, since young cocoa acreage may produce little or no crop. It should be possible to make a reasonably close long-term forecast of cocoa acreage since this will have a distinct trend (see para. 4.3.) .

3.2. The second main factor is the seasonal yield, which will depend on climatic conditions and the incidence of pests and disease; during each season estimates will be produced in the light of local specialised knowledge; but long-term forecasts of yield will not, of course be possible

except it may become apparent that the introduction of new varieties of cocoa will eventually result in an improved yield independent of seasonal effect.

3.3. Although cocoa theoretically has to be sold to the Gold Coast Cocoa Marketing Board, the potential cocoa production will not be the same as the quantity of cocoa exported, and it is the latter which is the subject of forecast each season. This will fall short of potential production by the amount of cocoa which is never harvested,, either through lack of initiative on the part of growers who may consider incentives insufficient to increase their efforts; or because harvesting is too infrequent, and some pods are allowed to remain on the trees until they become diseased or are destroyed by pests. This quantity is impossible to estimate, but it will account for some of the difference between yields achieved on experimental stations, and those of the small-scale producer.

3.4. Another difference between potential production and exports will be caused by cocoa which is smuggled across the border. In years when the controlled Gold Coast price is lower than the open market price realised in neighbouring territories, such smuggling will be from the Gold Coast into French territory, and exports will be lower than production. But during years where the controlled Gold Coast price is advantageous to growers, smuggling will be the other way, and potential production will be lower than appears from export figures. It is fairly certain, however, that the quantity of such smuggled cocoa, though considerable financially, will be less during any one season than the difference caused by weather conditions, and will not therefore seriously affect the trend of production

3.5. The Gold Coast Cocoa Marketing Board publish the quantity of their purchases each week, and at the end of each maincrop and midcrop season a detailed list is compiled of total purchases for the season at each of their buying centres, with a summary by area. These records have been available since 1947/48 when the Board commenced operations. Prior to this date figures are available from the wartime Control Boards arranged through the United Kingdom Ministry of Food, and these figures also are subdivided by area. In the pre-war days, cocoa was handled by commercial firms, and total and area figures had to be estimated from what information could be obtained from them, together with rail, road, river and shipping figures. Custom figures summarise the quantities on bill-of-ladings during each calendar month, and time-lags are such that it is difficult to relate these for individual months, though the total for crop years will not be far out.

PART II. THEORETICAL TRENDS.

4. Cocoa acreage.

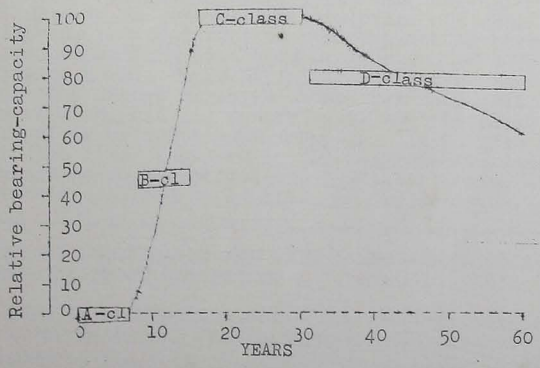
4.1. The Gold Coast farmer favours close planting, either of beans or seedlings, as the easiest and cheapest method of establishing a cocoa farm. There will be a high wastage among the young trees before the farm comes into bearing, and the larger gaps may be filled. The majority of farmers do not thin out to a desired spacing once the canopy has formed, as is the practice on Agricultural Stations. Further thinning out continues after the farm commences to bear, either through natural deaths or accidents caused by falling shade trees, wind, pests or disease. Gaps so caused may or may not be filled up by young trees.

4.2. The acreage of cocoa in the Gold Coast alters annually due to the addition of newly planted acreage and the death of some of the older plantings. There will also be losses through the cutting out of diseased acreage, but this is a special problem mainly affecting the Eastern Region of the Gold Coast; elsewhere it is trees and not acreage which are cut out.

4.3. A tree crop such as cocoa, which does not come into bearing for some years after it has been planted, will not show the same fluctuations in acreage as an annual crop where plantings are affected by prices, local conditions, weather, availability of seed, and other such limiting factors. Cocoa acreage will show some definite trend.

4.4. The age of a cocoa tree has considerable effect on its bearing-capacity. Areas of very young cocoa will not bear any crop at all; other areas will only bear to partial capacity. It is not sufficient to know only the total acreage under cocoa, the age-distribution has also to be taken into account. This is represented diagramatically in Fig.1, which shows on a relative scale the ages at which it is thought acreage commences to bear, reaches a maximum, and declines.

Fig 1. Relative bearing-capacity of cocoa acreage by age.



This production curve was produced after consultation with the most experienced persons in the Gold Coast regarding cocoa cultivation and has been used in two previous papers with no adverse criticism (2). It should be pointed out, however, that though the curve may be a satisfactory approximation in general, it will not necessarily apply in every area.

4.5. The cocoa acreage surveyed by the Gold Coast Department of Agriculture is recorded in four well-defined age groups. For convenience these are known as A,B,C, and D. The A-class group contains all the pre-bearing acreage under eight years old. The B-class group covers the next period from initial bearing up to maximum capacity at sixteen years old. The C-class group is wider and embraces all the next fifteen fully bearing years. The last group, D-class, takes in all cocoa from the time peak bearing capacity is passed until the trees start to die, and the acreage is gradually denuded of cocoa; details may be found in Appendix I.

4.6. There is a scarcity of data relating to older cocoa, since the crop was only introduced into the country in the latter part of the last century, and the scene of the earlier large-scale plantings was worst affected by the killing swollen shoot disease; here, the acreage that might reveal some information on this point has completely disappeared. The effect of soils on yield is also thought to have a greater effect as trees pass through the C-class phase and enter D-class.

4.7. This decline in acreage yield through the death of some trees must not be confused with the altogether different subject of whole acreage dying out, which is considered in section 6.

5. Cocoa Yields.

5.1. Cocoa yields are usually assessed on an acreage rather than a tree basis, as the former is more convenient to estimate than the number of trees, particularly with the Gold Coast's irregular planting methods. Moreover the proximity of planting is known to affect the tree-yield. Experiments have been conducted to find the most favourable spacing(3) but there is no conclusive evidence to show that results are the same for all localities and all soils.

5.2. Examination of cocoa production for past years, both in the Gold Coast and Nigeria, indicates that seasonal effects can cause the yield to vary by some ten percent in either direction. This is substantial when related to a crop of some quarter of a million tons, particularly in view of the extremely high price realised by cocoa. But in this instance it is not proposed to dwell on individual good or bad years. Normal yields will be assumed for calculating the trends of potential production.

5.3. Early reports on cocoa production indicate that crops used to be obtained at an earlier age than is now experienced, and this fact is corroborated by persons who have had connections with Gold Coast cocoa of twenty years standing or more. It is difficult to find a convincing explanation, except maybe in those days there was a greater choice of land, and the general soil fertility had not then been impaired by continuous cropping. It is also possible that in the first instance it was the more diligent farmers who turned to cocoa production, and their higher standards of cultivation resulted in earlier and larger crops.

---

(2) REPORT ON COCOA IN THE GOLD COAST - THE COCOA SURVEY AND SWOLLEN SHOOT CAMPAIGN. Tanburn, 1953.

COCOA IN WESTERN ASHANTI - Interim Analysis of Intensive Survey Data, and Forecast Producation Trend. Tanburn, 1955.

(3) RUSSELL, Imperial Journal of Experimental Agriculture, 1953

5.4. A convenient method of dealing with the different yields from each of the four age-class groups (see para.4.5.) is to reduce the acreage which is not bearing or not fully bearing to an equivalent in terms of maximum bearing; or in other words to use the C-class group as a common denominator. The four groups may then be combined into one "optimum-equivalent" acreage, to which a single yield may be applied.

5.5. The same theoretical bearing-capacity curve referred to above in para.4.4., and represented in Fig.1 has been used to calculate the average factor for each age-class group, as follows:-

TABLE 1a. Relative bearing-capacity of each age-class acreage.

age-class	age in years	optimum-equivalent factor
A	0 - 7	0.00
B	8 - 15	0.46
C	16 - 30	1.00
D	over 30	0.78

5.6. When assessing production in the early years of production, the earlier bearing age (para.5.3.) is taken into account by using the adjusted factors in Table 1b.

TABLE 1b. Relative bearing-capacity in early years for younger bearing.

year	younger bearing by	optimum-equivalent factor			
		A class	B class	C class	D class
10	3 years	0.06	0.77	No C-class	
11		0.06	0.77		
12		0.05	0.76		
13		0.05	0.74		
14		0.04	0.72		No D-class
15		0.04	0.70		
16	2 years	0.03	0.68	1.00	
17		0.03	0.66	1.00	
18		0.02	0.64	1.00	
19		0.02	0.62	1.00	
20		0.01	0.60	1.00	
21	1 year	0.01	0.57	1.00	
22		0.01	0.55	1.00	
23		0.01	0.52	1.00	
24		0.01	0.50	1.00	
25		-	0.48	1.00	
26	-	-	0.46	1.00	
27		-	0.46	1.00	

5.7. The condition of cocoa must also be taken into account when calculating production from acreage. Some acreage which should be producing crops may be in such poor condition that yield is curtailed or even reduced to nothing. Data on condition is obtainable from Intensive Survey which records the four groups, good, fair, poor and dying. Some arbitrary method of converting these classifications to a numerical basis is necessary for the calculation of a combined condition-factor, and it has been assumed that fair condition of cocoa will produce two-thirds, and poor condition one-third, of good condition cocoa; and that no yield will be obtained from dying acreage. Intensive Survey data on condition of cocoa acreage has been examined in detail in Section 13 below.

5.8. By applying a condition factor to the "optimum-equivalent" cocoa acreage, an "equivalent-production" acreage can be obtained, which is readily converted to absolute production in terms of tons, or thousand tons, by applying a normal yield which will vary according to locality and conditions (about 200 to 400 lbs per acre in the Gold Coast. . A lower normal yield will be obtained by the peasant small-holder common in the Gold Coast than that on Agricultural Stations where cultivation is superior, harvesting more frequent, and wastage reduced to a minimum (see para.3.3.).

6. Death-rate of cocoa acreage.

6.1. Cocoa has not been established long enough in the Gold Coast (para.4.6.) for a comprehensive study of the length of life of either cocoa trees or cocoa acreage, which are two distinct matters.

6.2. Individual trees in an area of cocoa may die with no appreciable effect on the area yield if the remaining trees spread their roots and produce a greater individual yield. With an increasing number of trees dying, the area yield will eventually decline, and this is taken into account in the discussion on age-class yields (Section 4).

6.3. In addition to this decline in yield with age, whole areas of cocoa die out, particularly on inferior or unsuitable soils. Not only do trees die from old-age, but there is also a normal 'accident-rate'; cocoa trees may be blown down or destroyed by falling shade trees, resulting in conditions favourable for a capsid pocket. A relatively small patch caused by the accident may spread very rapidly, and wipe out a considerable area of cocoa.

6.4. Since it is generally accepted that on the whole the length of life of cocoa trees in the Gold Coast is not very great, future trends of production cannot be forecast without taking the death-rate into account. In the absence of concrete data on the matter, a study has been made of the effect of the two alternative death-rates shown in Fig.2 on subsequent production; comparison is made with an unreal "nil" death-rate. As with the production curve (para.4.4.), the opinions of experienced persons was sought so that the rates selected should be as realistic as possible; details appear in Appendix II.

Fig. 2. Percentage of acreage still remaining for two alternative death-rates, and a 'nil' death-rate.

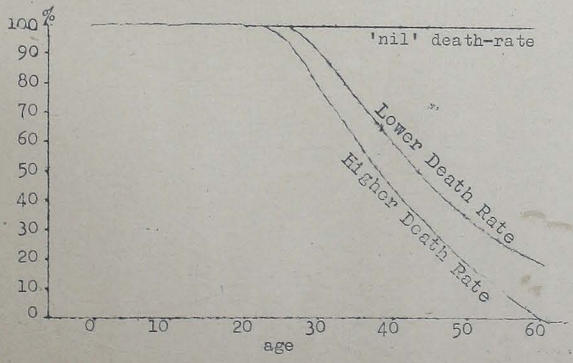
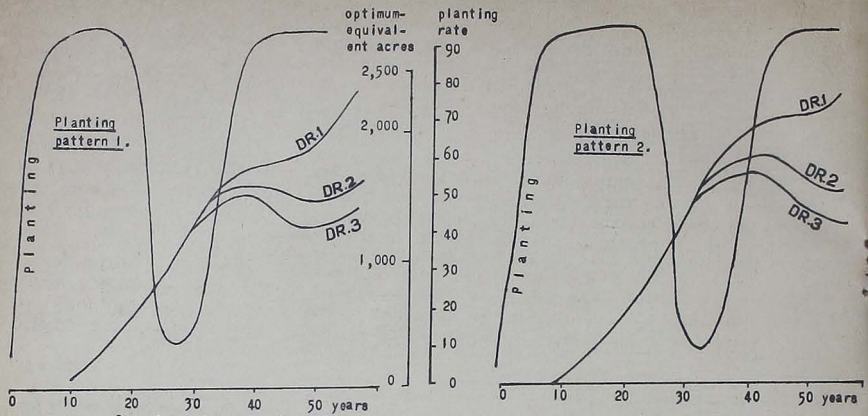
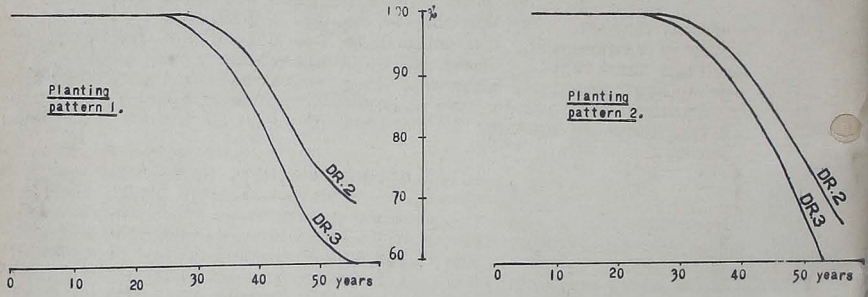


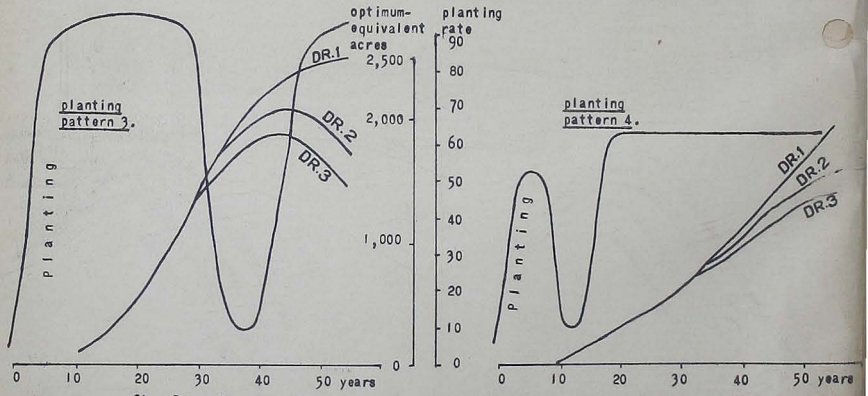
Fig. 3. 3a. Planting pattern and optinum-equivalent acreage.



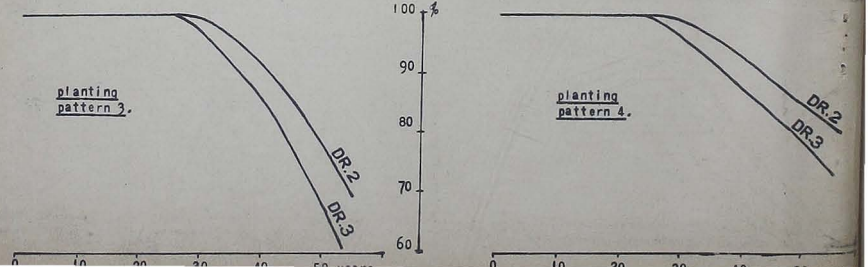
3b. Percentage loss in optimum-equivalent acreage attributable to death-rate.



3a. Planting pattern and optimum-equivalent acreage (cont).



3b. Percentage loss in optimum-equivalent acreage attributable to death-rate (cont).



6.5. The selected death-rates were applied to four planting patterns (Types 1-4 in Appendix III), and from the acreage remaining in each year the optimum-equivalent acreage was calculated. Comparing results with the "nil" rate, the loss attributable to the two death-rate was obtained, as shown in Fig 3; details are given in Appendix IV. As might be anticipated, the loss with time reaches a magnitude that will affect production, but the difference in optimum-equivalent acreage lags behind the difference in the rates themselves.

6.6. In subsequent calculations it was thought advisable to make conservative estimates by adopting the higher of the two death-rates, though in the opinion of some persons this is actually more suitable for the inferior soils.

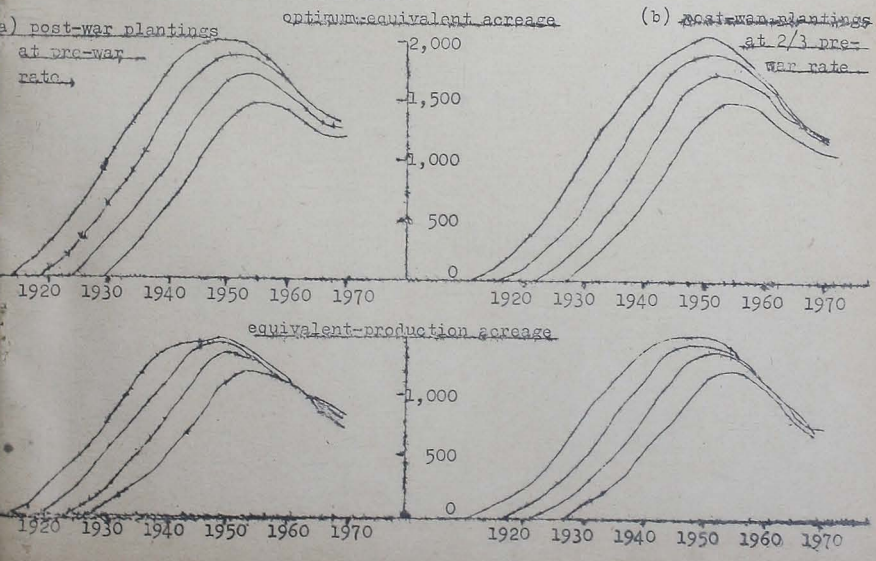
6.7. The results for the fourth planting pattern do not show the same decrease as the first three, since the decline attributable to the war period is less marked and occurs sooner after the commencement of planting. This might reflect the position for areas planted since 1930.

7. Theoretical forecasts.

7.1. Some of the same calculations made for assessing the death-rate effect were also used for studying future trends. The method used was to assume a planting pattern, apply a death-rate, and calculate for subsequent years the acreage that would remain in each age-class and the optimum-equivalent acreage; this was then converted to an equivalent-production acreage by use of condition-factors which decrease as the acreage ages as in table 8 on page 27; trends were continued forward to 1970.

7.2. For all these calculations the same wartime decline in planting was taken. Patterns 1,2,3, and 5, as listed in Appendix III, relate to planting commencing in 1920, 1915, 1910 and 1905 respectively with the same pre-war and post-war planting level; patterns 6,7,8 and 9 assume planting commenced at the same dates, but with post-war plantings only attaining some two-thirds of their pre-war level; this was to allow for areas where there is already a concentration of cocoa,

Fig.4. Optimum-equivalent acreage and equivalent production acreage for similar planting patterns commencing different dates, with the higher death-rate.



with consequently restricted availability of suitable land for expansion. With cocoa obtaining its present high price, it is unlikely that future plantings will fall off to any further extent.

7.3. The results of these calculations are shown in Fig.4a and 4b, on page 12 with details in Appendix V. It is seen that all these production curves reach a high peak about 1950 to 1955, after which they decline to a lower limit after a further fifteen or twenty years before tending to increase once again. The decline is more marked for the earlier planted areas and would be considerably reduced had the lower death-rate been taken.

7.4. There are a variety of reasons why inference should not immediately be drawn from these calculations that cocoa production in the Gold Coast may be on the verge of a decline. Not only the selection of the higher death-rate may produce an unduly pessimistic picture (para.6.6), but total equivalent-production acreage will be the amalgamation of a number of curves weighted according to the magnitude of planting at each date, together with additions for newer areas planted subsequent to the dates shown in these calculations; it will be seen later that the Intensive Survey results do in fact show large areas where plantings are increasing very rapidly and this will help to counterbalance areas of decline. Also with the present countrywide publicity campaigns there should be a marked improvement in the condition of cocoa, with a resultantly higher equivalent-production acreage. Lastly, there is no indication at the moment as to the rate of future plantings, and instead of continuing at or below the pre-war level the enormous demand for cocoa and the very favourable prices now realised may result in plantings becoming higher than ever as is now occurring in many parts of the country. It should also be pointed out that the least favourable of the curves calculated was for planting commencing 1905, though the majority of Gold Coast plantings did not occur till after this date.

PART III. INTENSIVE SURVEY DATA

8. Intensive Survey organisation

8.1. The Cocoa Division of the Department of Agriculture is systematically surveying all the potentially cocoa-producing areas of the Gold Coast, primarily with the object of locating swollen shoot disease so that it may be treated before it spreads beyond control. In due course all areas are being resurveyed one or more times in order to maintain the control achieved during Initial Survey.

8.2. A different technique of surveying is used in the "devastated areas" of the Eastern Region where swollen shoot has taken such a severe toll, as there it was considered expedient for treatment to precede survey. This analysis is for initial Intensive Survey only,, and does not include any information for the "devastated areas".

8.3. By the end of September 1955, over twelve million acres had been initially intensively surveyed, and nearly three and half million more acres re-surveyed. This does not include survey which, for one reason or another was replaced by a subsequent initial survey.

8.4. A large number of staff have been engaged on this survey work and consequently a considerable administrative organization was required. The Cocoa Division divides the potentially cocoa-producing areas of the Gold Coast into four regions, Western, Eastern, Ashanti and Trans-Volta. These Regions each contain a number of Divisions which are further sub-divided into areas.

8.5. In each area there are gangs of workers collecting the data in the field under supervision of an Agricultural Survey Officer (A.S.O.), who is responsible for both survey and treatment of disease. The latter is bound to take priority since large sums of money are involved in compensating farmers whose trees are cut out, and malpractice is apt to occur if supervision is not adequate.

8.6. Records are produced in triplicate. Areas submit their data to Senior Agricultural Survey Officers (S.A.S.O.) in Divisions, who pass it on to the Principal Agricultural Survey Officers (P.A.S.O.) in the Regional Office before it is submitted to Head Office, Accra. The volume of records passing through Divisional and Regional Offices is such that a complete check is obviously impossible, but glaring inaccuracies should be intercepted, and a control kept on the flow of work.

8.7. Each Region has its own Records Sections which are counterparts of Head Office Records Section, so theoretically there should be little difficulty in obtaining details of survey that has been completed in Head Office. But despite records having been prepared in triplicate, some seem to have completely disappeared in the Western Division, (see para. 1.6.), possibly when area offices were being reorganised and split, as the work became too great for one area. It is mainly in the Western Region that the unsatisfactory records were found, either because some of the details were omitted, or because the forms were numerically incorrect.

9. Intensive Survey records.

9.1. The official map of the Survey Department divides the Gold Coast into Field Sheets by latitude and longitude lines at 15' intervals, each square covering an area of about 300 square miles. Field Sheet squares are further divided by the Cocoa Division at 3' intervals, into twenty-five grid-squares of about 7,680 acres each. All grid squares may therefore be identified by a two-number reference, the first relating to the Field Sheet, and the second to the position of the grid-square within the field sheet.

9.2. For physical convenience in surveying, grid-squares are broken down into blocks with natural or easily recognised boundaries, and blocks thus have a three-numbered reference. Where a block falls in more than one grid-square it takes its first two reference numbers from the square within which the majority of the blocks lies.

9.3. In some parts of the Gold Coast, blocks are divided after survey by grid-lines. The first two reference numbers for all such artificial blocks within a grid square are thus the same, and they should total to approximately 7,680 acres. Where natural blocks are used the sum of all blocks bearing the same first two reference numbers may vary widely from 7,680 acres especially in forest or forest reserve areas, where blocks may be large.

9.4. During Initial Survey, details of general land usage are recorded in the broad categories of cocoa, food farms, bush and forest. In 1951 an additional category was added for sparse cocoa, where the original plantings have died out to such an extent that the area can no longer be considered as a cocoa farm. It is still necessary to watch such unproductive areas, as they are a potential danger from swollen shoot disease. The area under cocoa is recorded in further detail as to the age-class of the acreage, and the condition of the cocoa. Also recorded for each plot of cocoa, but not summarised in this present analysis, are the number of swollen shoot outbreaks (but not the acreage concerned), the variety of the cocoa grown, the severity of capsid damage, the presence of cola chlamydantha trees, and any other comments the field staff see fit to add.

9.5. In addition to these specified categories, information may also be given for areas under township and cleared land, the latter being either township or land cleared for planting with food crops.

9.6. Subsequent re-survey, which does not come within the scope of this report, omits details of general land usage, and the condition of cocoa.

9.7. Records are both visual and numerical. The block is mapped, and each category shown on the block map is measured and recorded on a form. The age-class of cocoa areas is shown on the map, but condition only appears on the form, where all cocoa areas are listed with relevant details.

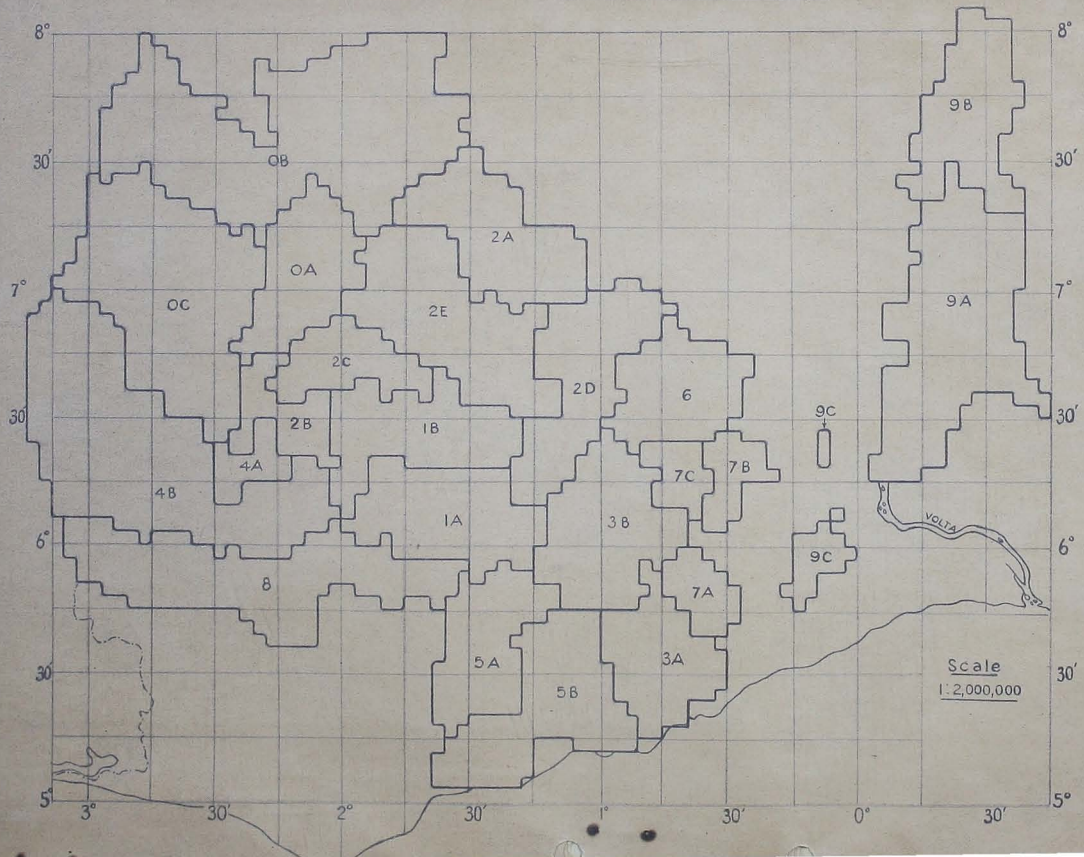
9.8. In due course block maps are amalgamated into a grid-square map which show the location and age-class of all cocoa. These are later reduced in scale and combined into a Regional age-class map, but the value of this latter is restricted, since survey for all dates is combined, and the B-class of today is the A-class of eight years ago, a fact that cannot be recorded on the map. It does, however, give a pictorial indication of the direction in which cocoa cultivation is spreading, and where replanting is taking place.

9.9. Grid-square maps have been used for assessing the area of Forest Reserves, which in earlier years were not surveyed. Additions have been made to the Intensive Survey data, as listed in Appendix VI. It is assumed that the whole of such areas is forest and this may result in underestimation of food farms. Policy has now changed, the Forest Reserves are surveyed in a modified form, sometimes in blocks so large that they cover more than an entire grid-square.

9.10. Survey cannot be expected to be absolutely accurate. There will be errors both in the physical work and in measuring the areas recorded on the block-tracings. It is even found that under tropical conditions the tracing paper used for mapping shrinks and expands sufficiently to affect the measurement of areas. It was impractical to adjust for the sparse cocoa which was not recorded before

FIG.5
STATISTICAL AREAS USED FOR INTENSIVE SURVEY SUMMARY

FIG. 6. GROUPS OF AREAS USED FOR STATISTICAL ANALYSIS.



GROUP CODE	AREA CODES
0 A	01, 08
0 B	02, 07, 09
0 C	03-06
1 A	10, 11
1 B	12, 13, 14
2 A	24
2 B	21, 22
2 C	20
2 D	23, 27
2 E	25, 26, 28
3 A	32, 33
3 B	30, 31, 34
4 A	42, 44
4 B	40, 41, 43, 45-48
5 A	53, 57
5 B	51, 55, 56
6	60-64
7 A	73
7 B	70, 71
7 C	72
8	80-84
9 A	90
9 B	91
9 C	99

1951 (para 9.4.) as although the acreage could be roughly assessed this would not settle the question as to whether it should be deducted from forest, bush, or cocoa, and in the case of the latter, which age-class cocoa. Consequently sparse cocoa is underestimated in those areas where the majority of survey took place before 1952. Other inaccuracies are referred to in paragraph 8.7.

9.11. Since 1954, all forms have been checked against block-tracings in Head Office and where there is more than 1% error the data is returned to the area for amendment. Prior to 1954 all work was supposed to be checked in Divisional Offices, but examination of the older data has shown that this was not always done. There is, however, such a large amount of data that aggregate errors will be greatly reduced.

10. Statistical areas, used for analysis.

10.1. The three-numbered block reference (para 9.2.) does not reflect which of the Cocoa Division's areas contains the block. This would in any case have been impracticable as area boundaries are changed from time to time.(para 8.7.).

10.2. It was therefore inconvenient to use the Cocoa Division areas for the analysis of the Intensive Survey data, and instead "statistical areas" have been used, which are composed of complete grid-squares coinciding as nearly as possible with the Cocoa Division areas. Throughout this report, 'area' relates to statistical area except where otherwise stated.

10.3. A code number was given to each of the statistical areas to assist with the mechanical sorting of the large number of punch cards representing Intensive Survey data; code, area, and grid-squares contained, are listed in Appendix VII, and the same information is represented on the map in Fig. 5.

10.4. Some of the Cocoa Division areas were so small that neighbouring areas were combined when coding for statistical area, but there still remained some sixty, which was rather numerous for purposes of estimation. These were later reduced to twenty-four, by combining areas in the same vicinity showing similar results according to Intensive Survey; groups of areas, with their additional group coding are shown in Fig.6.

11. Analysis of Intensive Survey data.

11.1. The summary of all Intensive Survey available in Head Office at the end of September 1955 is given in Table 2. Details for areas, and groups of areas appear in Appendices VIIIa and VIIIb.

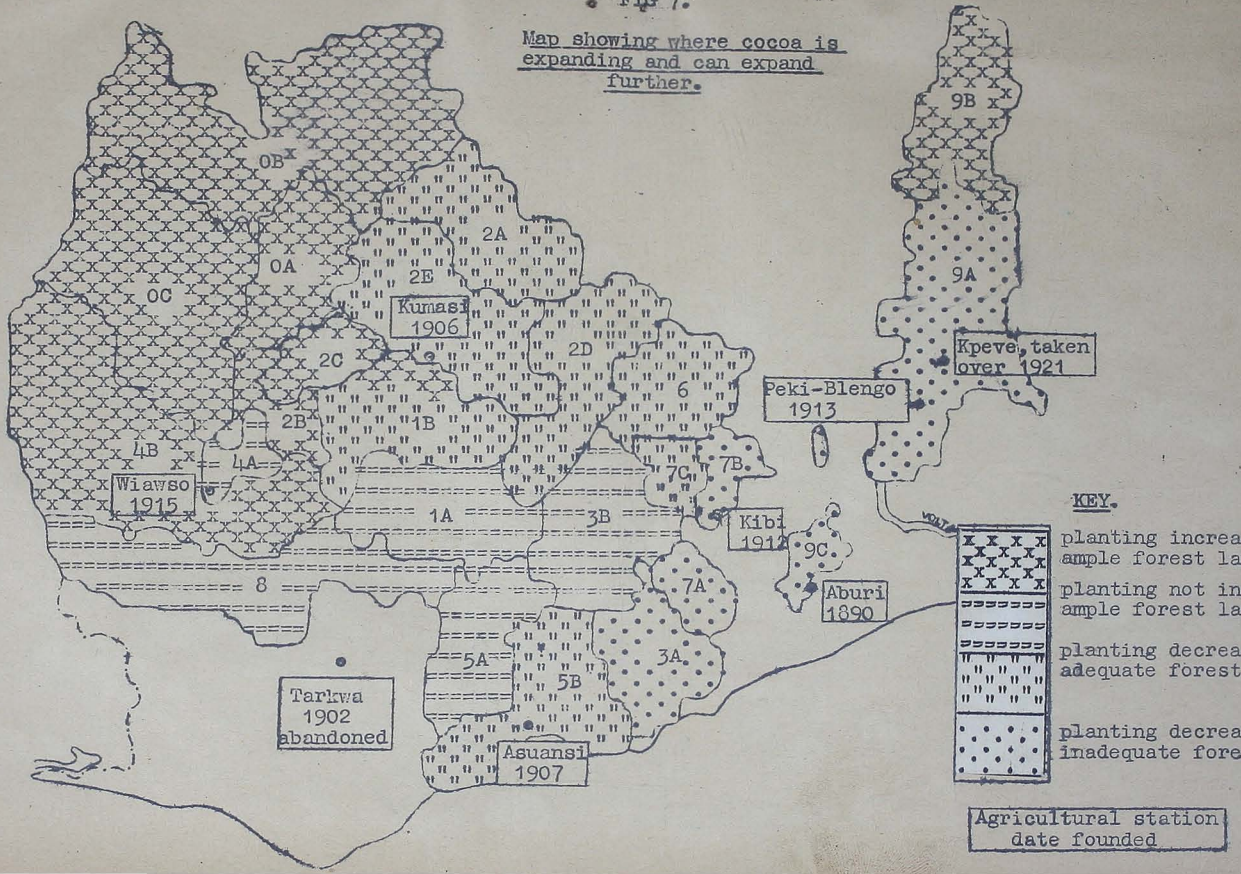
TABLE 2. Summary of Intensive Survey at end September, 1955.

category	acres	%
A-class cocoa	780,187.7	6.3
B-class cocoa	418,771.0	3.4
C-class cocoa	1,459,590.1	11.8
D-class cocoa	882,150.8	7.1
total cocoa	3,540,699.6	28.6
food farms	587,634.8	4.8
bush	3,570,754.5	28.9
forest	4,543,674.0	36.8
sparse cocoa	115,642.0	0.9
total	12,358,604.9	100.0

Forest includes 274,537.2 acres (2.2%) for Forest Reserve which was not actually surveyed. Bush includes 5,108 acres recorded as township and 23,339 acres cleared land (see APPENDIX X).

FIG 7.

Map showing where cocoa is expanding and can expand further.



11.2. For the use of Officers of the Cocoa Division in the field, analysis was made by grid-square and year of survey, but the resultant bulk of tables and figures proved too voluminous to include in this present report.

11.3. The total acreage surveyed each year, excluding the additions for unsurveyed Forest Reserve, is shown in Table 3, with area details in Appendix VIIIc.

TABLE 3. Summary of Intensive Survey, by year of survey.

year	acres	%
1946	176,345.5	1.5
1947	387,686.0	3.2
1948	280,603.2	2.3
1949	515,811.4	4.3
1950	1,132,017.9	9.4
1951	1,912,113.4	15.8
1952	1,857,461.8	15.4
1953	2,022,252.5	16.7
1954	2,405,683.3	19.9
1955ø	1,394,092.7	11.5
total	12,084,067.7	100.0

ø January to September, 1955 only.

11.4. Since acreage figures are inconvenient for purposes of comparison, all data is given in percentage form in Appendices IXa and IXb for areas and groups of areas. Group percentages have been arranged in Table 4 to show where cocoa plantings appear to be increasing and where there is still forest land available for future expansion. This is also shown in Fig 7.

TABLE 4. Percentage of forest and cocoa in Intensive Survey.

%

description	group code	forest			cocoa			
		Reserve	other	total	A	B	C	D
1.plantings increasing, ample forest land. (4,105 thousand acres.)	2B	-	75	17	11	1	4	1
	0C	-	67	23	11	3	8	1
	4B	3	53	19	6	2	8	3
	2C	1	41	43	17	2	17	7
	0A	-	34	53	20	6	21	6
	9B	-	30	36	10	5	20	1
	0B	-	25	31	11	4	14	2
2.plantings not increasing, ample forest land. (2,253 thousand acres.)	5A	-	69	11	2	1	5	3
	8	-	50	13	2	1	6	4
	3B	4	48	21	3	3	7	8
	1A	10	47	22	2	5	10	5
	4A	1	26	30	7	4	14	5
3.plantings decreasing, adequate forest land. (3,974 thousand acres.)	2D	9	43	35	6	10	11	8
	7C	25	35	26	4	4	7	11
	6	3	35	22	2	2	9	9
	1B	1	25	39	2	4	18	15
	5B	-	22	23	3	1	11	8
	2A	-	21	16	3	2	8	3
	2E	2	19	53	5	5	23	20
4.plantings decreasing, inadequate forest land. (2,026 thousand acres.)	7B	9	13	53	5	8	19	21
	9A	-	10	10	1	1	5	3
	3A	-	5	40	3	3	15	19
	7A	3	5	62	4	6	33	19
	9C	-	3	16	-	-	2	14

11.5. The area where cocoa plantings are decreasing and there is inadequate forest land available for expansion lies approximately within a semicircle of seventy miles radius centered on Accra, with less cocoa in the eastern half. Here occurred some of the earliest plantings, when the forest belt was much nearer the coast than at present, as it is an uncontroversial fact that the forest has been steadily receding during the last forty-five years or so. Agricultural stations in this area include Aburi founded in 1890, Kibi founded in 1912, Peki-Blengo founded in 1913, and Kpeve which was founded by the Germans at some unknown date and taken over by the Gold Coast Government in 1921. It may be assumed that the first plantings of cocoa preceded the founding of a station by a few years, after which plantings would increase considerably as the local people became interested and were instructed in methods of cultivation. A station founded at Tarkwa in 1902 was soon abandoned as the area proved unsuitable for cocoa production. More recently founded stations have not been included as they do not indicate when cocoa plantings commenced.

11.6. Although according to the Intensive Survey results adequate forest land would appear to be available, plantings are decreasing in the area westwards along the coast in which lies the station of Asuansi founded in 1907. This is also true of the vast area north and northwestwards towards Kumasi where a station was founded in 1906; and again westwards and northwestwards. The north-east of this area borders on savannah country, and less cocoa is found there; further south, some of the forest indicated in the Intensive Survey records lies along the steep escarpment, and is unsuitable for cocoa cultivation. In most of this area there is already a substantial proportion of cocoa.

11.7. In the western half of the Gold Coast there is a band between some fifty to eighty miles from the coast where plantings were apparently never very heavy and are not now increasing although there is much forest land. The station of Wiawso founded in 1915 lies within this area. Possible causes are unsuitable soils and lack of population, as this area contains the centre of the mining industry of the Gold Coast, which is a large employer of labour.

11.8. The remainder, which represents over 40% of the total Intensive Survey area, lies mainly further west, northwest, and north, and in the northern part of Trans-Volta, and here not only cocoa plantings are showing a very definite increase, but there is still ample forest land available for future expansion.

12. Estimates for total area.

12.1. Survey is more advanced in some parts of the country than others, particularly those least favourable to future cocoa prospects, so conclusions should not be drawn solely from those results included in the above Intensive Survey summary. Estimates have been made to cover the total acreage in each area, as in Table 5, and although this may involve some error where the available data is still scanty, it should be preferable to amalgamating the summarised data as it stands.

TABLE 5. Estimated total acreage and recorded acreage.

'000 acres

category	estimated total acreage	recorded acreage
A-class cocoa	1,182	780
B-class cocoa	538	419
C-class cocoa	1,943	1,460
D-class cocoa	1,067	882
total cocoa	4,730	3,541
food farms	799	588
bush	5,242	3,571
forest	7,089	4,544
sparse cocoa	188	115
total	18,048	12,359

FIG. 8 PROGRESS OF INTENSIVE SURVEY
AT END SEPTEMBER, 1955.

12.2. Where survey was already well advanced, the outstanding acreage was measured from the grid-square maps, the Forest Reserve segregated, and the balance apportioned between the land usage categories according to the results of the summarised data.

12.3. Where survey was less advanced or the grid-square maps not yet available the outstanding acreage was based on the number of squares in the area, and divided up in the same manner. The percentage of each area Intensively Surveyed is indicated in Fig 8, and listed in Appendix XI. Table 6 shows the estimated total acreage in each category for groups of areas.

TABLE 6. Total estimated acreage for groups of areas.

group code	%surveyed	total area	cocoa	food farms	bush	forest	sparse cocoa	cocoa A	cocoa B	cocoa C	cocoa D
AO	87.9	625	334	12	66	211	2	133	40	127	34
OB	37.9	2,221	665	89	865	596	6	247	82	287	49
OC	79.6	1,499	368	19	120	986	6	185	41	120	22
1A	100.0	752	167	35	121	426	3	23	34	73	37
1B	100.0	700	275	49	189	182	5	18	27	125	105
2A	95.9	655	103	21	384	146	1	18	12	53	20
2B	87.9	309	54	5	16	232	2	36	3	11	4
2C	97.5	404	175	11	50	167	1	68	8	71	28
2D	72.9	771	199	23	180	368	1	36	56	60	47
2E	88.6	1,055	554	58	199	243	1	59	47	237	211
3A	84.0	550	195	74	238	36	7	16	15	74	90
3B	99.1	809	171	47	141	425	25	26	28	53	64
4A	78.2	177	43	10	51	71	2	10	6	20	7
4B	23.1	1,838	309	50	348	1,121	10	123	36	115	35
5A	52.3	603	89	23	89	387	15	24	11	32	22
5B	55.8	869	200	64	413	160	32	29	10	86	75
6	84.1	589	122	55	156	225	31	14	9	51	48
7A	100.0	156	97	24	19	13	3	6	9	52	30
7B	93.9	120	59	11	16	33	1	6	8	21	24
7C	95.0	180	44	6	9	111	10	7	7	12	18
8	20.1	1,225	164	63	364	615	19	24	7	81	52
9A	97.5	1,243	121	34	962	125	1	16	14	63	28
9B	73.7	611	208	11	181	207	4	58	28	118	4
9C	100.0	87	14	5	65	3	-	-	-	1	13
total	68.6	18,048	4,730	799	5,242	7,089	188	1,182	538	1,943	1,067

12.4. The only areas where estimates have had to be based on insufficient data for reliable results are Northern Ashanti (OB), and Western Region (4B and 8), which happen to be three of the largest areas. Elsewhere the estimates should be reasonably trustworthy, with the possible exception of the Cape Coast Division (5A and 5B).

12.5. The percentage of forest and cocoa by age-class, as shown in Table 4 for Intensive survey results, is repeated in Table 7 for total estimated area. The approximate area for each description, and the progress of survey has also been included.

Fig 9.

Condition-factor by estimated date of planting.

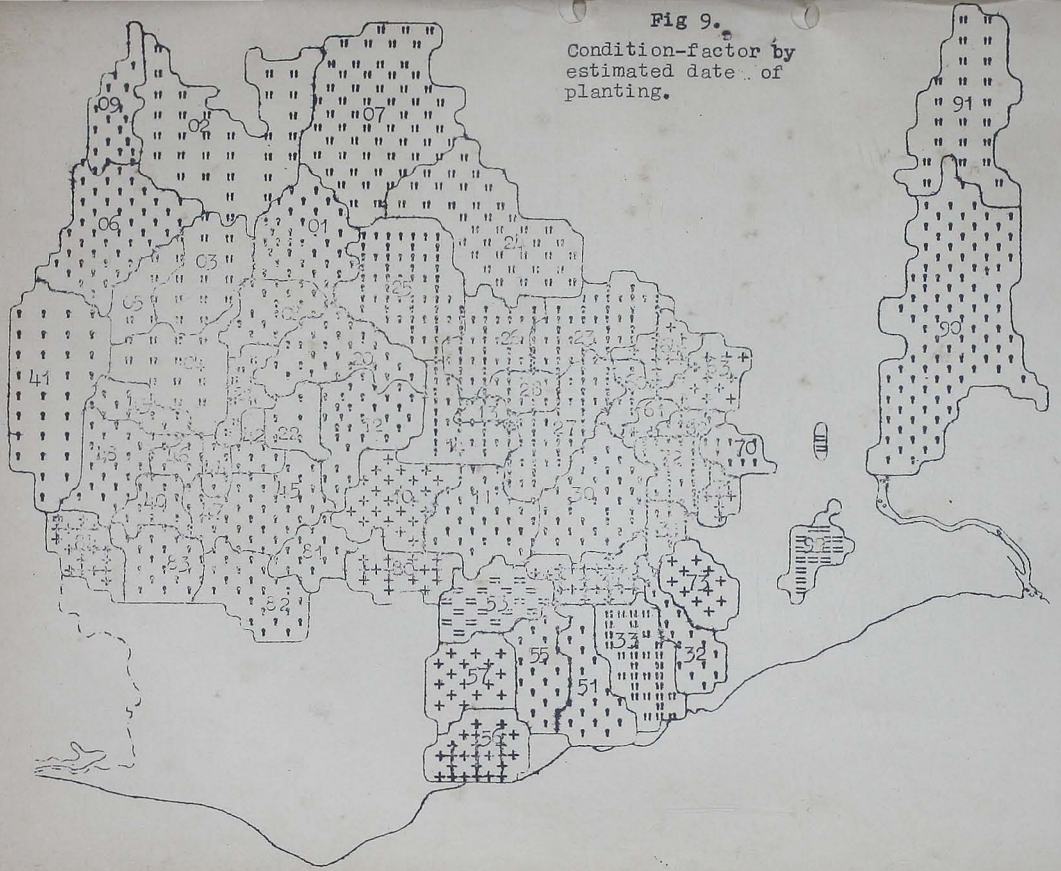


TABLE 7. Percentage of forest and cocoa, estimated for total area.

description	group code	forest			cocoa			
		Reserve	other	total	A	B	C	D
1.planting increasing, ample forest land. 7,507,000 acres 54.7% surveyed	2B	-	75	17	12	1	3	1
	0C	-	66	25	12	3	8	2
	4B	7	54	17	7	2	6	2
	2C	1	41	43	17	2	17	7
	0A	-	34	53	21	7	20	5
	9B	5	29	34	9	5	19	1
	0B	2	25	30	11	4	13	2
2.plantings not increasing, ample forest land. 3,566,000 acres 63.2% surveyed	5A	-	64	15	4	2	5	4
	8	-	50	14	2	1	7	4
	3B	5	47	21	3	3	7	8
	1A	10	47	22	3	4	10	5
	4A	19	21	24	6	3	11	4
3.plantings decreasing, adequate forest land. 4,819,000 acres 82.5% surveyed	2D	16	32	26	5	7	8	6
	7C	29	33	24	4	3	7	10
	6	4	35	21	2	2	9	8
	1B	1	25	39	2	4	18	15
	5B	1	18	23	3	1	10	9
	2A	1	21	16	3	2	8	3
	2E	4	19	53	6	4	23	20
4.plantings decreasing, inadequate forest land. 2,156,000 acres 94.0% surveyed	7B	15	13	50	5	7	18	20
	9A	-	10	10	1	1	5	3
	3A	1	6	35	3	3	13	16
	7A	3	5	62	4	6	33	19
	9C	-	3	16	-	-	2	14

The difference between the two tables is seen to be relatively insignificant.

13. Condition of cocoa acreage.

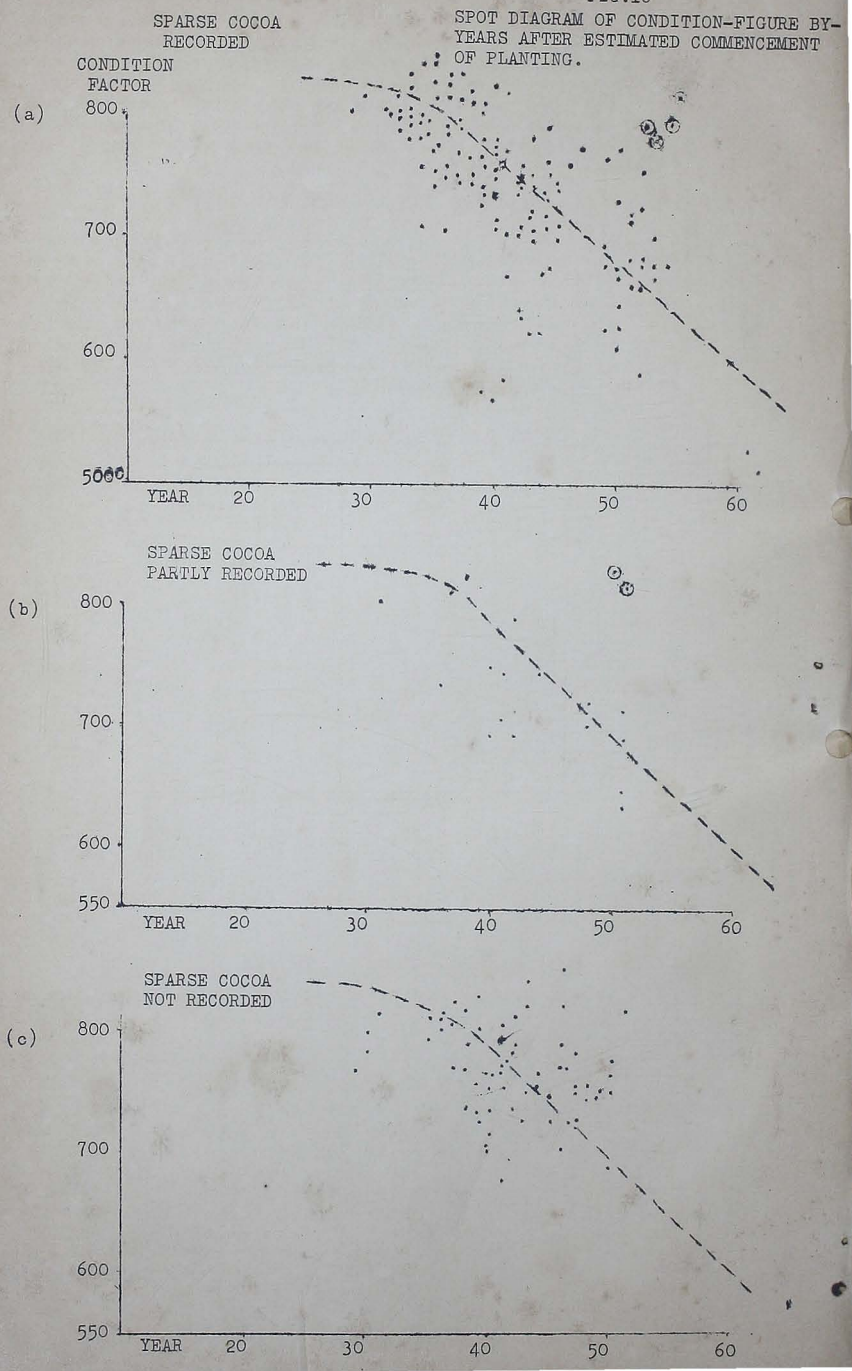
13.1. The condition of cocoa acreage, as judged by the field staff at the time of survey, is recorded in the broad groups good, fair, poor, and dying. Although this information is supplied exclusively by junior staff, the aggregate results prove remarkably consistent.

13.2. Condition-factors have been calculated as described in para.5.7. for each area and each group of areas, by ascribing the arbitrary values 1.00 to good condition acreage, 0.66 to fair condition, 0.33 to poor condition and 0.00 to dying acreage. This last is in accordance with the instruction issued to the field staff. The values for the intermediate classifications are entirely arbitrary, and calculations made for alternative values were found to cause a general scaling up or down, but with little other effect on the general argument. Results for the selected values are included in Appendices IXa and IXb, and the factor varies between 0.520 and 0.844.

13.3. Condition-factor appeared to be lower in the earlier planted areas, and was therefore related to the age of the acreage. Condition-factors were calculated for the data summarised by year of survey in each area, and the date at which planting commenced in each area was estimated by a careful examination of the age-class distribution and taking into account any other available information on the subject, such as the dates at which cocoa stations were founded, and the memory of the officers with the longest experience of Gold Coast cocoa. Area results are given in Appendix XI and are represented in Fig 9.

FIG.10

SPOT DIAGRAM OF CONDITION-FIGURE BY-YEARS AFTER ESTIMATED COMMENCEMENT OF PLANTING.



13.4. All results based on more than 1,000 acres of cocoa have been plotted on the spot diagram in Fig.10, which shows the condition-factor by year after the commencement of planting. Separate diagrams have been made where sparse cocoa was not separately recorded, or where it appears not to have been recorded during the entire calendar year, as this may have affected the condition recorded. Calculations based on less than 1,000 acres were omitted as such small samples showed excessive variation. A few rather extreme results in an area of inferior quality data (area 33) have been ringed, and should be disregarded.

13.5. For the rest, there seems but little doubt that condition does depend on age of cocoa acreage. Data is sufficient between 30 and 50 years for assessing an empirical trend, as indicated by the dotted line; this has been continued in either direction, assuming that in the early years a constant value of about .850 might occur, and for the later years a steady decline, though rather above the two isolated values in the Aburi region, which is no longer within the cocoa surveying area, and therefore probably not representative of what may later occur elsewhere.

Table 8. Trend in condition-factor by age of cocoa acreage.

years after planting	condition-factor
15	.850
20	.845
25	.840
30	.835
35	.820
40	.775
45	.735
50	.695
55	.650
60	.605
65	.565

13.6. At some future date, an analysis might be made of the condition of acreage within age-classes, but this is not currently available. The condition-factors in Table 8 were used for calculating equivalent production acreage in the theoretical trends in Section 7.

14. Trends shown by Intensive Survey.

14.1. Where survey has extended over a number of years combined totals are apt to be misleading, as the A-class cocoa of 1946 compares with the B-class of 1954. Moreover, prior to 1951 sparse cocoa was distributed amongst the four age-classes, with some no doubt with forest or even bush.

14.2. The data has been examined by year of survey, and to facilitate comparison the acreage in each age-class in each group of areas has been expressed as a percentage of the area surveyed; the additions for unsurveyed Forest Reserves were excluded. Results are given in Appendix XII, which divides the data according to whether the post-war cocoa appears to be greater than, equal to or less than the pre-war level; a fourth section contains areas where data is unsatisfactory or insufficient to draw any conclusions regarding the post-war level. A total has been computed for the combined data in each section.

14.3. Breaking down the data in this manner resulted in a large number of units some of which are rather small and therefore subject to considerable sampling-error.

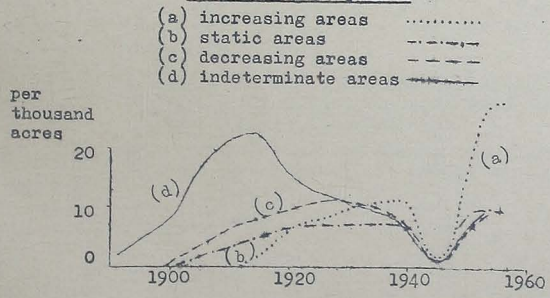
The percentage of survey which took place during each year indicates which calculations should be disregarded; some of the more extreme figures, based on very scanty data, were omitted.

14.4. Variation from the 'true' value occurs through survey during any one year not necessarily being representative of the whole area, as would have been the case had the survey been planned primarily for statistical purposes; as it is, survey tends to commence where it is known that there is cocoa which may require disease control and then moves systematically according to administrative convenience throughout the Cocoa Division's area (not the statistical area or group of areas). Frequently the areas where little or no cocoa is anticipated are left to the last, and where Forest Reserve is surveyed the large size of blocks may unbalance the rest of the data.

14.5. The worst of the irregularities in the combined data for each section have been smoothed out by redistributing the annual area surveyed in such a manner that the total of the two older age-classes is constant. In point of fact this sum is more likely to increase slightly each year except in the older planted areas, but rather than estimate a rate of increase the same arbitrary correction was used throughout. The results are summarised in Appendix XIII, and appear to give a reasonable trend for all four age-classes.

14.6. Taking into account the size of each group of areas and the approximate dates planting is thought to have commenced, an annual planting pattern was worked out to fit the Intensive Survey results for the years 1946 to 1955, allowance being made for both the death-rates used in Section 6. All four patterns show a similar decline during the war period, as shown in Fig 11a. Extracts from these planting patterns are included in Appendix XIII.

Fig.11a. Planting patterns fitted to Intensive Survey data

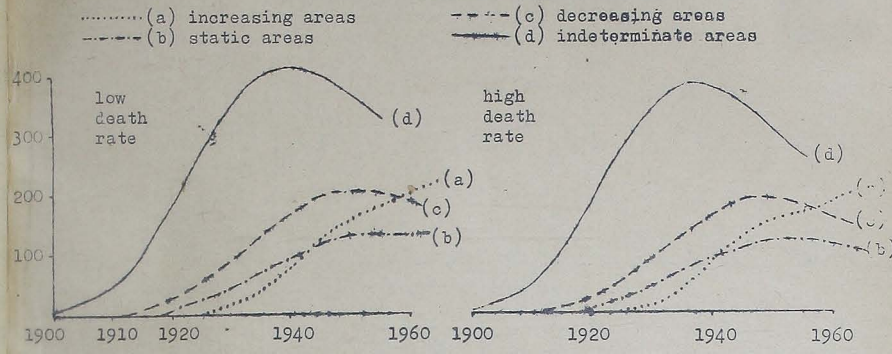


14.7. Correcting the 1954 and 1955 data for the increasing areas in section (a) to the same proportion of C + D-class as in the other years resulted in such an unbelievably high current planting rate that it is more likely that survey is moving into the very latest planted areas, where the proportion of C + D really is lower. A rather conservative view was therefore taken, and the planting pattern for the most recent years for this section was fitted nearer to the uncorrected data.

14.8. The fitted patterns for the static areas of section(b) and the decreasing areas of section(c) show a lower D-class acreage than the corrected data, but this may be partly caused by assuming C + D constant instead of slightly increasing (see para. 14.5.). It was rather more difficult to fit a pattern to the indeterminate areas in section (d) which contains the less satisfactory data, and showed greater irregularity.

14.9. The optimum-equivalent acreages calculated for the fitted patterns for all years from the commencement of bearing to 1963 are shown in Fig 11b, with details in Appendix XIV;

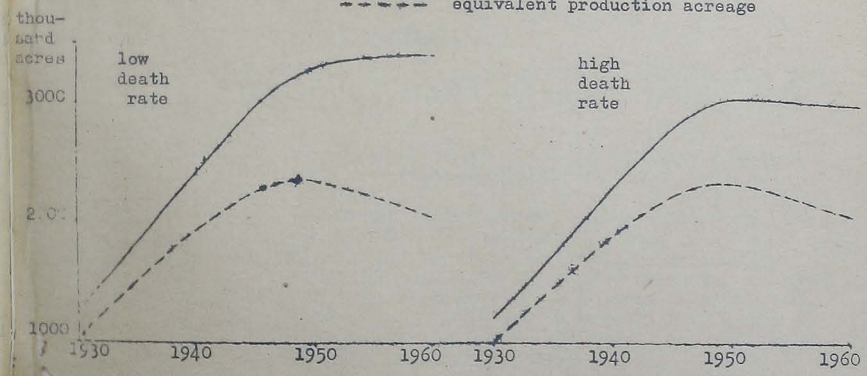
Fig 11b. Optimum-equivalent acreage for fitted planting patterns.



for the indeterminate areas in section (d) where data was inadequate for assessing the current planting position, figures were not taken yeyond 1955. No attempt has been made to carry forward beyond 1963, as this would have meant further arbitrary assumptions regarding the future planting rate and as it is the final year is only based on nine months' data, and happens to be a particularly important year as revealing the recovery from the war-time decline in planting.

14.10. Indication of the total optimum-equivalent cocoa acreage in the Gold Coast has been obtained by applying the results given in Appendix XIV to the total area within each section, as in Fig 12, and Table 9. The equivalent-production acreage was obtained by applying the condition-factors in Table 8.

Fig 12. Trend in total optimum-equivalent and equivalent-production acreages for high and low death-rates.



These figures will overestimate, as they allow for neither Forest Reserve areas where there is virtually no cocoa, nor for the areas of lesser cocoa being surveyed last; but it does afford a means of amalgamating the four sections.

TABLE 9. Trend in optimum-equivalent and equivalent production acreages for planting patterns fitted to Intensive Survey data.

section description	(a) increasing		(b) static		(c) decreasing		(d) indeterminate		total	
area, in 000 acres	7,507		3,566		5,882		1,093		18,048	
planting commenced	1915		1910		1905		1900			
death-rate	low	high	low	high	low	high	low	high	low	high
optimum-equivalent thousand acres.										
1930	143	143	157	157	529	529	387	373	1216	1202
1935	345	345	253	253	776	753	437	413	1811	1764
1940	638	638	346	342	982	947	449	410	2415	2337
1945	968	968	428	403	1159	1088	435	386	2990	2845
1950	1224	1179	474	435	1212	1118	400	338	3310	3070
1955	1366	1269	478	435	1182	1053	357	286	3383	3043
1960 ∅	1516	1404	474	421	1112	959			3412	3014
equivalent-production thousand acres.										
1930	121	121	133	133	445	445	323	311	1022	1010
1935	292	292	213	213	648	629	359	339	1512	1473
1940	536	536	289	286	805	777	348	318	1978	1917
1945	809	809	351	330	898	843	320	284	2378	2266
1950	1003	966	368	337	891	821	278	235	2540	2359
1955	1059	983	351	320	822	732	232	186	2464	2221
1960 ∅	1115	1032	330	292	723	623			2353	2087

∅ using an approximation for section (d)

14.11. Roughly speaking, it would appear that the newer acreages are compensating for the decline in the older areas; but that from 1950 production is likely to commence declining unless the downward trend in condition-factor can be halted by improved methods of cultivation and maintenance. The position will be improved if the conservative trend for the increasing areas proves to be too low.

15. Summary and conclusions.

15.1. The production of cocoa in the Gold Coast has been examined with special reference to the following factors:-

i) The date at which cocoa is thought to have been introduced into each part of the Gold Coast;
ii) The annual planting rate from commencement of planting to the present time;
iii) The age at which cocoa acreage is thought come into bearing, reach its maximum, and decline;
iv) The rate at which it is thought that cocoa acreage dies out (two alternative rates);
v) The decline in condition with age, and consequent decline in yield.

The combination of these last three factors would have the effect on one hundred acres planted as shown in Fig 13 and Table 10.

Fig 13. Equivalent-production acreage per hundred acres planted.

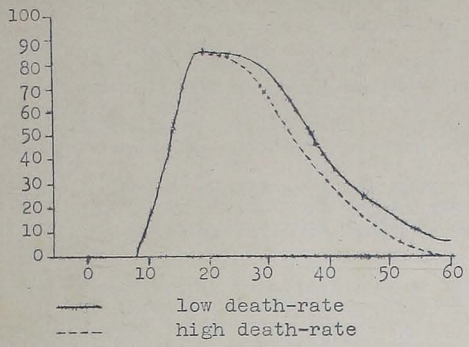


Fig 13 has been based on the figures given in Table 10.

TABLE 10. Combined effect of age, acreage death-rate, and condition-factor on acreage production.

age	relative acreage yield	condition factor	remaining acreage		relative production	
			high death rate	low death rate	high death rate	low death rate
5	.00		100	100	0	0
10	.16	.850	100	100	14	14
15	.76	.850	100	100	65	65
20	1.00	.845	100	100	85	85
25	1.00	.840	99	97	83	81
30	1.00	.835	92	80	77	67
35	.94	.820	77	61	59	47
40	.86	.775	61	45	40	30
45	.78	.735	48	32	28	18
50	.73	.695	36	20	18	10
55	.69	.650	26	10	12	4
60	.62	.605	21	2	8	1

15.2. The subject was first treated as a theoretical problem, which was later applied to the results of analysing Intensive Survey data. The cocoa producing areas of the Gold Coast were divided into four sections according to whether cocoa cultivation appeared to be increasing, static, decreasing, or could not be determined.

15.3. The earliest areas to be planted with cocoa are now showing a decline, which has nothing whatever to do with swollen shoot disease; this latter does not come within the scope of this present report as a different technique of surveying is used there, and the data is not comparable with Intensive Survey data. But as production in the devastated areas has already dropped from some 80,000 tons a year to about 15,000 tons, further large-scale declines from this cause should not occur assuming that the present strict control of the disease is maintained.

15.4. Over a large proportion of the Gold Coast cocoa cultivation is still increasing, and there is no reason why it should not continue to do so. But in spite of this the total bearing acreage does not appear likely to increase much further; and as the present acreage ages, production is likely to decline unless a better condition of cocoa can be achieved. The present large-scale publicity campaigns appear to be very opportune.

15.5. A further danger to cocoa production is that the fertility of the soil may be steadily impaired by continuous cropping, and this could cause a future decline in yield.

15.6. Finally, all results based on this present analysis of Intensive Survey data must be considered as provisional, even though they afford an indication of the future position. The full extent of the recovery from the wartime decline in planting will be more evident when all the 1955 and 1956 data is available, and Re-survey data may also shed further light on the matter.

December, 1955.

PART IV. APPENDICES.

APPENDIX I

Relative bearing-capacity by year and age-class.

A-class		B-class		C-class		D-class	
year	relative bearing-capacity	year	relative bearing-capacity	year	relative bearing-capacity	year	relative bearing-capacity
1	0	9	7	17	96	32	99
2	0	10	16	18	100	33	98
3	0	11	27	19	100	34	96
4	0	12	39	20	100	35	94
5	0	13	51	21	100	36	93
6	0	14	64	22	100	37	91
7	0	15	76	23	100	38	89
8	0	16	88	24	100	39	87
				25	100	40	86
				26	100	41	84
				27	100	42	82
				28	100	43	81
				29	100	44	79
				30	100	45	78
				31	99	46	77
						47	76
						48	75
						49	74
						50	73
						51	72
						52	72
						53	71
						54	70
						55	69
						56	68
						57	66
						58	64
						59	63
						60	62
						61	60
sum	0	sum	368	sum	1,495	sum	2,349
average	0	average	46	average	100	average	78

APPENDIX II.

Assumed percentage death-rates.

year	'nil' death-rate	lower death-rate	higher death-rate
	DR 1	DR 2	DR 3
21	0	0	0
22	0	0	0
23	0	0	1
24	0	0	2
25	0	1	3
26	0	1	6
27	0	2	9
28	0	4	12
29	0	6	16
30	0	8	20
31	0	10	24
32	0	13	28
33	0	16	32
34	0	20	35
35	0	23	39
36	0	26	42
37	0	29	46
38	0	32	49
39	0	36	52
40	0	39	55
41	0	42	58
42	0	45	60
43	0	48	63
44	0	50	65
45	0	52	68
46	0	54	71
47	0	57	73
48	0	60	75
49	0	62	78
50	0	64	80
51	0	66	83
52	0	68	85
53	0	70	87
54	0	72	89
55	0	74	90
56	0	75	92
57	0	76	94
58	0	77	96
59	0	78	97
60	0	79	98
61	0	80	100

APPENDIX III

Planting patterns used for
death-rate and trend calculations

	planting pattern type								
	1	2	3	4	5	6	7	8	9
1	5	5	5	5	5	5	5	5	5
2	16	16	16	16	16	16	16	16	16
3	36	36	36	36	36	36	36	36	36
4	52	52	52	52	52	52	52	52	52
5	66	66	66	66	66	66	66	66	66
6	80	80	80	52	80	80	80	80	80
7	87	87	87	53	87	87	87	87	87
8	89	89	89	52	89	89	89	89	89
9	91	91	91	50	91	91	91	91	91
10	93	93	93	37	93	93	93	93	93
11	93	93	93	20	93	93	93	93	93
12	94	94	94	10	94	94	94	94	94
13	94	94	94	9	94	94	94	94	94
14	94	94	94	10	94	94	94	94	94
15	94	94	94	12	94	94	94	94	94
16	95	95	95	23	95	95	95	95	95
17	95	95	95	36	95	95	95	95	95
18	95	95	95	55	95	95	95	95	95
19	94	95	95	61	95	95	95	95	95
20	90	95	95	63	95	95	95	95	95
21	84	95	95	64	95	84	95	95	95
22	73	95	95	64	95	73	95	95	95
23	54	95	95	64	95	54	95	95	95
24	37	94	95	64	95	37	95	95	95
25	27	90	95	64	95	27	95	95	95
26	17	84	95	64	95	17	84	95	95
27	12	73	95	64	95	12	73	95	95
28	10	54	95	64	95	10	54	95	95
29	10	37	94	64	95	10	37	95	95
30	11	27	90	64	95	11	27	95	95
31	13	17	84	64	95	13	17	84	95
32	19	12	73	64	95	16	12	73	95
33	28	10	54	64	95	20	10	54	95
34	35	10	37	64	94	24	10	37	95
35	44	11	27	64	90	29	11	27	95
36	54	13	17	64	84	35	13	17	95
37	66	19	12	64	73	40	16	12	84
38	75	28	10	64	54	48	20	10	73
39	84	35	10	64	37	54	24	10	54
40	89	44	11	64	27	58	29	11	37
41	91	54	13	64	17	60	35	13	27
42	93	66	19	64	12	62	40	16	17
43	93	75	28	64	10	64	48	20	12
44	94	84	35	64	10	64	54	24	10
45	94	89	44	64	11	64	58	29	10
46	94	91	54	64	13	64	60	35	11
47	94	93	66	64	19	64	62	40	13
48	94	93	75	64	28	64	64	48	16
49	94	94	84	64	35	64	64	54	20
50	94	94	89	64	44	64	64	58	24
51	94	94	91	64	54	64	64	60	29
52	94	94	93	64	66	64	64	62	35
53	94	94	93	64	75	64	64	64	40
54	94	94	94	64	84	64	64	64	48
55	94	94	94	64	89	64	64	64	54
56	94	94	94	64	91	64	64	64	58
57	94	94	94	64	93	64	64	64	60
58	94	94	94	64	93	64	64	64	62
59	94	94	94	64	94	64	64	64	64
60	94	94	94	64	94	64	64	64	64

APPENDIX IV. Effect of death-rates on optimum-equivalent acreages.

Year	planting pattern 1					planting pattern 2.				
	optimum-equivalent acreages			% DR 1 acreage		optimum-equivalent acreages			% DR 1 acreage	
	DR 1	DR 2	DR 3	DR 2	DR 3	DR 1	DR 2	DR 3	DR 2	DR 3
10	52	52	52	100	100	52	52	52	100	100
11	83	83	83	100	100	83	83	83	100	100
12	117	117	117	100	100	117	117	117	100	100
13	166	166	166	100	100	166	166	166	100	100
14	213	213	213	100	100	213	213	213	100	100
15	269	269	269	100	100	269	269	269	100	100
16	316	316	316	100	100	316	316	316	100	100
17	369	369	369	100	100	369	369	369	100	100
18	416	416	416	100	100	416	416	416	100	100
19	476	476	476	100	100	476	476	476	100	100
20	532	532	532	100	100	532	532	532	100	100
21	593	593	593	100	100	594	594	594	100	100
22	666	666	666	100	100	667	667	667	100	100
23	735	735	735	100	100	735	735	735	100	100
24	811	811	811	100	100	813	813	813	100	100
25	883	883	881	100	100	883	883	881	100	100
26	962	962	958	100	100	962	962	958	100	100
27	1,055	1,054	1,047	100	99	1,056	1,055	1,048	100	99
28	1,147	1,143	1,133	100	99	1,150	1,146	1,136	100	99
29	1,237	1,232	1,215	100	98	1,245	1,240	1,223	100	98
30	1,321	1,313	1,288	99	98	1,339	1,331	1,305	99	97
31	1,397	1,381	1,351	99	97	1,434	1,417	1,388	99	97
32	1,464	1,442	1,399	99	96	1,527	1,515	1,462	99	96
33	1,524	1,494	1,442	98	95	1,616	1,586	1,534	98	95
34	1,575	1,535	1,468	97	93	1,698	1,657	1,591	98	94
35	1,620	1,568	1,492	97	92	1,772	1,719	1,643	97	93
36	1,659	1,593	1,504	96	91	1,833	1,768	1,678	96	92
37	1,691	1,608	1,510	95	89	1,884	1,801	1,702	96	90
38	1,717	1,615	1,502	94	87	1,929	1,827	1,709	95	89
39	1,732	1,611	1,488	93	86	1,968	1,847	1,724	94	88
40	1,741	1,596	1,461	92	84	2,004	1,859	1,724	93	86
41	1,748	1,579	1,429	90	82	2,037	1,868	1,718	92	84
42	1,753	1,556	1,395	89	80	2,067	1,870	1,709	90	83
43	1,759	1,533	1,351	87	77	2,090	1,863	1,692	89	81
44	1,768	1,513	1,330	86	75	2,105	1,850	1,664	88	79
45	1,783	1,492	1,301	84	73	2,113	1,821	1,625	86	77
46	1,803	1,474	1,274	82	71	2,120	1,790	1,585	84	75
47	1,828	1,469	1,255	80	69	2,124	1,761	1,540	83	73
48	1,858	1,461	1,243	79	67	2,130	1,727	1,497	81	70
49	1,894	1,457	1,234	77	65	2,139	1,694	1,455	79	66
50	1,935	1,460	1,233	75	64	2,154	1,667	1,417	77	66
51	1,982	1,467	1,235	74	62	2,174	1,640	1,380	75	64
52	2,036	1,482	1,250	73	61	2,198	1,624	1,352	74	61
53	2,099	1,508	1,274	72	61	2,229	1,609	1,330	72	60
54	2,171	1,541	1,306	71	60	2,265	1,597	1,314	71	58
55	2,251	1,579	1,343	70	60	2,306	1,590	1,304	69	57
56	2,336	1,628	1,387	70	59	2,353	1,592	1,298	68	55

APPENDIX IV (continued)

Effect of death-rates on optimum-equivalent acreages

Year	planting pattern 3					planting pattern 4				
	optimum-equivalent acreages			% DR. 1 acreage		optimum-equivalent acreages			% DR.1 acreage	
	DR 1	DR. 2	DR. 3	DR.2	DR.3	DR.1	DR. 2	DR. 3	DR.2	DR.3
10	52	52	52	100	100	39	39	39	100	100
11	83	83	83	100	100	66	66	66	100	100
12	117	117	117	100	100	98	98	98	100	100
13	116	116	166	100	100	133	133	133	100	100
14	213	213	213	100	100	162	162	162	100	100
15	269	269	269	100	100	194	194	194	100	100
16	316	316	316	100	100	221	221	221	100	100
17	369	369	369	100	100	249	249	249	100	100
18	416	416	416	100	100	270	270	270	100	100
19	476	476	476	100	100	289	289	289	100	100
20	532	532	532	100	100	306	306	306	100	100
21	594	594	594	100	100	325	325	325	100	100
22	667	667	667	100	100	348	348	348	100	100
23	735	735	735	100	100	373	373	373	100	100
24	813	813	813	100	100	407	407	407	100	100
25	883	883	881	100	100	442	442	440	100	100
26	962	962	958	100	100	485	485	481	100	99
27	1,056	1,055	1,048	100	99	523	522	515	100	98
28	1,150	1,146	1,136	100	99	558	554	545	99	98
29	1,245	1,240	1,223	100	98	592	587	572	99	97
30	1,339	1,331	1,306	99	98	627	618	600	99	96
31	1,434	1,418	1,388	99	97	663	650	626	98	94
32	1,528	1,506	1,463	99	96	700	686	655	98	94
33	1,619	1,589	1,537	98	95	749	726	688	97	92
34	1,706	1,665	1,598	98	94	800	770	728	96	91
35	1,790	1,737	1,661	97	93	851	814	766	96	90
36	1,870	1,805	1,715	96	92	903	858	805	95	89
37	1,947	1,864	1,766	96	91	956	901	847	94	89
38	2,021	1,914	1,806	95	89	1,008	946	887	94	88
39	2,083	1,975	1,846	95	89	1,061	985	924	93	87
40	2,156	2,011	1,876	83	87	1,114	1,030	967	92	87
41	2,212	2,042	1,893	92	86	1,170	1,072	1,009	92	86
42	2,259	2,063	1,902	91	84	1,229	1,119	1,053	91	86
43	2,302	2,076	1,904	90	83	1,291	1,167	1,095	90	85
44	2,341	2,086	1,900	89	81	1,353	1,214	1,135	90	84
45	2,376	2,085	1,891	88	80	1,416	1,261	1,177	89	83
46	2,409	2,080	1,874	86	78	1,476	1,304	1,212	88	82
47	2,438	2,075	1,854	85	76	1,535	1,347	1,245	88	81
48	2,462	2,058	1,828	84	74	1,591	1,384	1,276	87	80
49	2,476	2,031	1,789	82	72	1,643	1,418	1,302	86	79
50	2,484	1,997	1,741	80	70	1,694	1,449	1,323	86	78
51	2,490	1,958	1,691	79	68	1,744	1,475	1,344	85	77
52	2,495	1,917	1,637	77	66	1,794	1,505	1,360	84	76
53	2,504	1,876	1,583	75	63	1,844	1,530	1,377	83	75
54	2,510	1,835	1,535	73	62	1,894	1,556	1,395	82	74
55	2,529	1,799	1,493	71	59	1,944	1,578	1,408	81	72
56	2,544	1,766	1,444	69	57	1,993	1,599	1,421	80	71

APPENDIX V.

Theoretical acreage by age-class, optimum-equivalent acreage, and equivalent production acreage, for similar planting patterns commencing at different dates.

PLANTING COMMENCING 1905

Year	postwar planting pre-war rate							postwar planting ⅔ pre-war rate						
	A	B	C	D	total	opt-eq:	eq-prod:	A	B	C	D	total	opt-eq:	eq-prod:
1915	651	57	-	-	708	83	71	651	57	-	-	708	83	71
1920	748	431	-	-	1179	316	269	748	431	-	-	1179	316	269
1925	758	721	175	-	1654	594	502	758	721	175	-	1654	594	502
1930	760	754	611	-	2125	958	805	760	754	611	-	2125	958	805
1935	760	760	1038	-	2558	1388	1159	760	760	1038	-	2558	1388	1159
1940	743	760	1277	113	2893	1715	1406	749	760	1277	113	2899	1715	1406
1945	476	760	1305	353	2894	1930	1496	482	760	1304	353	2899	1929	1495
1950	137	680	1309	547	2673	2048	1505	137	686	1309	547	2679	2051	1507
1955	214	314	1303	683	2514	1980	1376	158	314	1309	683	2464	1946	1352
1960	538	120	1103	764	2525	1754	1140	348	109	1109	764	2330	1755	1141
1965	732	334	694	801	2561	1472	891	490	225	700	801	2216	1428	864
1970	752	645	402	801	2600	1323	747	512	421	372	807	2112	1195	675

PLANTING COMMENCING 1910

Year	postwar planting pre-war rate							postwar planting pre-war rate						
	A	B	C	D	total	opt-eq:	eq-prod:	A	B	C	D	total	opt-eq:	eq-prod:
1920	651	57	-	-	708	83	71	651	57	-	-	708	83	71
1925	748	431	-	-	1179	316	269	748	431	-	-	1179	316	269
1930	758	721	175	-	1654	594	502	758	721	175	-	1654	594	502
1935	760	754	611	-	2125	958	805	760	754	611	-	2125	958	805
1940	743	760	1038	-	2541	1388	1159	749	760	1038	-	2547	1388	1159
1945	476	760	1277	113	2626	1715	1406	482	760	1277	113	2632	1715	1406
1950	137	680	1305	353	2475	1893	1467	137	686	1304	353	2480	1895	1469
1955	214	314	1303	547	2378	1874	1377	158	314	1309	547	2328	1880	1382
1960	538	120	1103	683	2444	1691	1175	348	109	1109	683	2249	1692	1176
1965	732	334	694	764	2524	1444	939	490	225	700	764	2179	1399	909
1970	752	645	409	796	2602	1327	803	512	421	372	801	2106	1190	671

PLANTING COMMENCING 1915

Year	postwar planting pre-war rate							postwar planting pre-war rate						
	A	B	C	D	total	opt-eq:	eq-prod:	A	B	C	D	total	opt-eq:	eq-prod:
1925	651	57	-	-	708	83	71	651	57	-	-	708	83	71
1930	748	431	-	-	1179	316	269	748	431	-	-	1179	316	269
1935	758	721	175	-	1654	594	502	758	721	175	-	1654	594	502
1940	743	754	611	-	2108	958	805	749	754	611	-	2114	958	805
1945	476	760	1038	-	2274	1388	1159	482	760	1038	-	2280	1388	1159
1950	137	680	1277	113	2207	1678	1376	137	686	1277	133	2213	1681	1378
1955	214	314	1298	353	2179	1718	1331	158	314	1304	353	2129	1724	1336
1960	538	120	1103	547	2308	1585	1165	348	109	1109	547	2113	1586	1166
1965	732	334	694	683	2443	1380	959	490	225	700	683	2098	1336	929
1970	752	645	409	759	2565	1298	844	512	421	372	764	2069	1162	755

PLANTING COMMENCING 1920

Year	postwar planting pre-war rate							postwar planting pre-war rate						
	A	B	C	D	total	opt-eq:	eq-prod:	A	B	C	D	total	opt-eq:	eq-prod:
1930	651	57	-	-	708	83	71	651	57	-	-	708	83	71
1935	748	431	-	-	1179	316	269	748	431	-	-	1179	316	269
1940	741	721	175	-	1637	593	501	747	721	175	-	1643	593	501
1945	476	754	611	-	1841	958	805	482	754	611	-	1847	958	805
1950	137	680	1038	-	1855	1351	1128	137	686	1038	-	1861	1354	1128
1955	214	314	1271	113	1912	1504	1233	158	314	1277	113	1862	1510	1238
1960	538	120	1098	353	2109	1429	1107	348	109	1104	353	1914	1429	1107
1965	732	334	694	547	2307	1274	936	490	225	700	547	1962	1230	904
1970	752	645	409	678	2435	1235	858	512	421	372	683	1988	1093	763

UNSURVEYED FOREST RESERVE, INCLUDED IN THE INTENSIVE SURVEY SUMMARY.

code	area	grid reference	acres
01	Benchem		-
02	Berekum		-
03	Goaso North	"	-
04	Goaso South		-
05	Goaso West		-
06	Dormaa Ahen		-
07	Techiman		-
08	Tepa		-
09	New Drobo		-
10	Obuasi	50/2	1,121.4
		86/5	681.5
		86/13	949.0
		86/22	2,541.8
			5,293.7
11	Brofoyedru	50/3	2,305.1
		50/4	5,054.0
		50/5	4,397.0
		53/5	670.0
		86/9	3,740.0
		86/10	3,812.8
		86/14	2,130.0
		86/18	2,017.5
		86/20	165.0
		86/23	4,219.0
		86/24	857.5
		86/25	4,748.0
		89/1	862.0
		89/2	523.3
		89/3	961.0
		89/6	20.0
		89/7	10.0
		89/8	2,452.4
		89/13	2,508.5
		89/14	426.5
		89/15	1,223.0
		89/16	1,606.0
		89/17	380.0
		89/19	2,909.9
		89/20	3,632.1
		89/21	3,796.0
		89/22	2,033.4
		89/23	123.0
		89/24	1,828.8
		89/25	4,005.9
		90/11	1,252.0
		90/21	106.8
		91/21	140.0
		91/23	1,950.0
			66,866.5
12	Antoakrom		Nil -
13	Bekwai N.	91/2 ø	3,968.5
		91/3 ø	2,032.0
			6,000.5
14			Nil -

code	area	grid reference	acres
20	Nkawie	127/11	3,195.0
			3,195.0
21	Nkawie W.		Nil -
22	Asenanyo	84/19	130.0
			130.0
23	Konongo	132/7	6,373.6
		132/12	6,448.0
		132/13	7,052.4
		132/16	3,507.5
		132/17	5,420.1
		132/18	1,594.8
		132/19	3,252.8
		132/20	4,965.3
		132/22	1,040.5
		132/23	1,912.5
		132/25	120.0
		135/22	4,677.0
			46,364.5
24	Mampong	132/2	552.8
			552.8
25	Offinso	127/1	5,814.0
			5,814.0
26	Effiduasi	131/15	63.0
		131/20	1,161.0
		132/11	316.0
			1,540.0
27	Juaso	89/9	1,152.6
		89/10	738.0
		91/24	462.0
		92/1	274.1
		92/2	1,108.0
		92/3	0.9
		130/15	571.0
		130/18	520.0
		130/23	815.0
			5,641.6
28	Konongo South	130/16	985.0
		130/17	4,435.9
		130/21	3,386.5
		130/22	7,357.6
			16,165.0
30	Kade	54/1	167.0
		90/10	1,169.0
		90/15	3,273.0
		90/20	1,490.3

ø Lake Bosomtwi

Appendix VI. (continued)

UNSURVEYED FOREST RESERVE, INCLUDED IN THE INTENSIVE SURVEY SUMMARY.

code	area	grid reference	acres
30	Kade	93/6	7,559.8
		93/7	3,906.5
		93/11	7,600.0
		93/12	957.0
		93/16	1,094.0
		95/ 6	1,399.5
		95/18	1,578.0
			30,194.1
31	Bawdua		Nil
32	Akroso		Nil
33	Swedru		Nil.
34	Biene		Nil
40	Kofikrom		Nil
41	Bia		Nil
42	Awaso	84/16	1,254.0
			1,254.0
43	Buaku		Nil
44	Tano		Nil
45	Diaso	84/17	7,280.0
		84/18	4,023.0
		84/24	626.0
			11,929.0
46	Sui No.1		Nil
47	Anwhiam		Nil
48	Jabeso		Nil
80	Dunkwa		Nil
81	Tonton		Nil
82	Asankrangwa		Nil
83	Enchi No.2		Nil
84	Enchi No.1		Nil
51	Asikuma		Nil
53	Foso		Nil
55	Assin		Nil
56	Jukwa		Nil
57	Twifu		Nil
60	Nkawkaw N.W.	95/1	2,065.0
		95/2	273.0
		95/7	231.9
			2,569.9
61	Nkawkaw S.E.	95/9	1,462.0
		95/10	786.0
		95/13	515.0
			2,763.0
62	Kankang	96/3	623.0
		96/4	2,420.0
		96/5	7,424.0
			10,467.0
63	Mpraeso		Nil.
64	Abetifi		Nil.
65			Nil.
70	Osino Div.	96/10	3,359.0
		96/19	2,342.0
		96/20	2,576.0
			8,277.0
71	Kibi Div.	94/5	2,271.0
			2,271.0
72	Kwabeng Div.	94/3	779.9
		94/4	7,648.5
		94/8	1,819.0
		95/14	7,640.0
		95/15	7,482.0
		95/19	4,311.0
		95/20	2,391.0
		96/11	4,239.7
		96/16	216.5
		96/24	5,909.0
			42,436.6
73	Asamankese	58/2	4,812.0
			4,812.0
90	Kpeve		Nil
91	Jasikan		Nil
	TOTAL		274,537.2

APPENDIX VII.

Statistical areas.

WESTERN ASHANTI

area code	group code	area	field sheet	grid-square reference	number of grid square
01	0A	Bechem	124	4,5,10.	3
			161	5,10,15,20,25	5
			162	1 - 25	25
			164	8,13,14,17 - 25	12
			165	1,6,7,11,16,17,21,22.	8
			167	21.	1
					54
02	0B	Berekum	160	2,3,4,5,9,10,13 - 15, 19, 20	11
			161	2, 4, 9	3
			163	1 - 25	25
			164	1,2,6,7,11,12,16.	7
			197	5, 15,20	3
			198	1 - 25	25
			200	6,11,12,16,17,21,22,23.	8
			201	1,5,10,11,12,15-18,21-25	14
			202	1,2,3,6,7,8,11,12,13, 16,17,21,22	13
			203	14,19,20,24,25	5
			204	13,14,16,17,18,21,22,23	8
					122
03	0C	Goaso North	120	2-5, 7-10, 12-15, 18-20	15
			123	1-3, 6-7, 11	6
			158	5,9,10,14,15,19,20,23-25	10
			161	3, 6-8, 11-14, 16-19 21 - 24.	16
					47
04	0C	Goaso South	80	5, 10	2
			83	1, 2, 6.	3
			117	4,5,9,10,14,15	6
			118	1-15, 17-20, 22-25.	23
			119	25	1
			120	17, 21-25	6
			121	1,2,6,7,11,12,16,17,21, 22	10
			123	8,12,13,16,17,21	6
					57
05	0C	Goaso West	119	4,5,9,10,14,15,19,20,24	9
			120	1, 6, 11, 16	4
			157	25	1
			158	8,12,13,16-18, 21-22	8
					22
06	0C	Dormaa Ahenkro	116	4, 5.	2
			119	1 - 3, 7, 8, 13	6
			154	10,15,19,20,23-25	7
			157	1 - 24	24
			158	1-4, 6,7,11	7
			159	5, 6, 8 - 25.	20
			160	11,16-18, 21-25	9
			161	1	1
					76
07	0B	Techiman	164	3 - 5, 9,10,15	6
			165	2, 3	2
			167	1 - 19, 22 - 24	22
			168	1 - 3, 6	4
			202	4,5,9,10,14,15,18-20, 23 - 25	12
			204	10,15,19,20,24,25	6
			205	1 - 25	25

.....206/

APPENDIX VII. (continued)

Statistical areas

WESTERN ASHANTI (continued)

area code	group code	area	field sheet	grid-square reference	number of grid square
07	0B	Techiman (continued)	206	1 - 14, 16 - 24	23
			207	3 - 25	23
			208	1 - 3, 6 - 8, 11,12,16, 17, 21, 22	12
					135
08	0A	Tepa	121	3	1
			123	4,5,9,10,14,15,18-20,22-25	13
			124	1-3, 6-9, 11-14,16,17,21	14
					28
09	0B	New Drobo	159	2 - 4, 7,	4
			160	1, 6 -8, 12	5
			197	3,4,7-10,12-14,17-19,22-25	16
			199	5,10,15,19,20,23 - 25	8
					33
SOUTHERN ASHANTI.					
10	1A	Obuasi	49	5,	1
			50	1, 2	2
			85	3-5, 7-10, 12-20,22,23,25	19
			86	1-8, 11-13, 16,17,21,22	15
			87	18 - 20, 23 - 25	6
			88	21 - 25	5
					48
11	1A	Brofoyedru	50	3 - 5	3
			53	1 - 7, 9 - 11	10
			86	9, 10, 14, 15,18-20,23-25	10
			89	1 -3, 6 - 8, 11 - 25	21
			90	11, 16, 21	3
			91	21 - 23	3
					50
12	1B	Antoakrom	82	5, 10	2
			84	5, 10, 15, 25.	4
			85	1, 2, 6, 11	4
			87	1 - 17, 21, 22.	19
			88	1, 2, 6, 7, 11.	5
			122	20, 25	2
			125	12,13, 16-18, 20 - 25	11
			126	16, 21, 22	3
					50
13	1B	Bekwai North	88	5,	1
			91	1 - 4	4
			129	21 - 23	3
					8
14	1B	Bekwai South	88	3,4, 8-10, 12-20	14
			91	6 - 9, 11 - 14, 16 - 18	11
			126	8, 13, 14, 18, 19,23 -25	8
					33
EASTERN ASHANTI.					
20	2C	Nkawie	121	15	1
			122	2 - 17	16
			124	15, 18 - 20, 22 - 25	8
			125	1 - 11, 14, 15, 19.	14
			126	1,6,7,11,12, 17	6
			127	11, 16 - 18, 21 - 24	8
					53
21	2B	Nkawie West	83	3,7,8,12,13	5
			121	4,5,8-10, 13,14,18-20, 23 - 25	13
			122	1, 21	2
					20

APPENDIX VII (continued)

Statistical areas

EASTERN ASHANTI (continued)

area code	group code	area	field sheet	grid-square reference	number of grid square
22	2B	Asenanyo	84	1-4, 6-9, 11-14, 19,20	14
			122	18, 19, 22 - 24	5
					19
23	2D	Konongo	130	1 - 4, 6 - 8	7
			132	5, 7 - 10, 12 - 25	19
			133	1	1
			135	1 - 23	23
			136	6	1
			173	22, 23	2
					53.
24	2A	Mampong	131	1, 3 - 5, 9	5
			132	1 - 4	4
			166	4,5,10,15,20	5
			167	20, 25	2
			168	4, 5, 7 - 25	21
			169	1 - 25	25
			170	1-3, 6-9, 11-14, 16-19, 21 - 24	19
			171	1, 6-8,11-14,16-19,21-24	16
			206	25	1
			209	21	1
					99
25	2E	Offinso	126	2, 3	2
			127	1-10,12-15,19,20,25	17
			128	1 - 23	23
			165	4,5,8-10,12-15,18-20,23-25	15
			166	1-3,6-9,11-14,16-19,21-25	20
					77
26	2E	Effiduasi	126	4,5,9,10,15,20	6
			128	24, 25	2
			129	1 - 12, 16	13
			131	2, 6-8, 10-25	20
			132	6, 11	2
					43
27	2D	Juaso	89	4,5,9,10	4
			90	1, 2, 6	3
			91	5, 10, 15, 19,20,24,25	7
			92	1-14, 16-18, 21-23	20
			130	5,8,10,13-15, 18-20,23-25	12
			133	6, 11, 16, 17, 21	5
					51
28	2E	Konongo South	129	13 -15, 17 - 20, 24, 25	9
			130	11, 12, 16, 17, 21, 22	6
					15
DA/SWEDRU DIVISION					
30	3B	Kade	54	1 - 5, 9	6
			57	1, 2	2
			90	3-5,7-10,12-15,17-20,22-25	19
			92	15, 19, 20, 24, 25	5
			93	1-4, 6-9, 11-14, 16-19, 21 - 23	19
			95	6,11,12, 16-18,21-25	11
					62
31	3B	Bawdua	57	5, 10	2
			58	1	1
			93	15, 20, 25	3
			94	11,12,16,17,21,22	6
					12

.....Akroso/

Statistical areas

ODA/SWEDRU DIVISION (contd.)

area code	group code	area	field sheet	grid-square reference	number of grid square
32	3A	Akroso	32	2 - 5, 7 - 9	7
			56	1,2,6,7,11-14,17-20, 22 - 25	16
			57	8, 14, 15, 20, 25	5
			58	21	1
					29
33	3A	Swedru	31	2-5,7-10,13-15,19,20, 24, 25.	15
			32	1,6,7,11,12,16,17	7
			55	1 - 20, 22 - 25	24
			56	16, 21	2
			57	24	1
					49
34	3B	Biene	54	6-8,10-15,18-20,23-25	15
			57	3,4,6-8,11-13,16-19,21-23	15
			93	24	1
					31
WIAWSO DIVISION					
40	4B	Kofikrom	77	15, 19, 20, 25	4
			78	1-3,6-8,11-13,16-19,24	14
					18
41	4B	Bia	74	3-5, 8-10, 13, 14	8
			76	1-10,12-15,17-20,22-25	22
			77	1	1
			79	1, 6, 11, 16, 21	5
			114	1 - 25	25
			116	3, 7 - 25	20
			117	1-3,6-8,11,12,16,17,21	11
			119	6,11,12,16,17,18,21-23	9
					101
42	4A	Awaso	83	4,5,9,10,14,15,18-20, 23 - 25	12
			84	16, 21	2
					14
43	4B	Buaku	79	3 - 5	3
			80	1 - 4, 6 - 9	8
			117	13, 18 - 20, 22 - 25	8
			118	16, 21	2
					21
44	4A	Tano	81	1, 2, 6, 7	4
			83	11, 16, 17, 21, 22	5
					9
45	4B	Diaso	45	3, 4, 5	3
			46	1	1
			81	3-5,8-10,13-15,18-20, 23 - 25	15
			82	1-4,6-9,11-19, 21, 22	19
			84	17, 18, 22 - 24	5
					43
46	4B	Sui No.1	78	4	1
			80	14,15,17-20, 22 - 25	10
					11
47	4B	Anwhiam	45	1	1
			78	5,9,10,14,15,20,25	7
			81	11,12,16,17,21,22	6
					14
48	4B	Jabeso	74	15	1
			77	2 - 14, 18	14
			79	2,7-10,12-15,17-20,22-25	17
			80	11 - 13, 16, 21	5
					37

.....Cape Coast Division/

APPENDIX VII(continued)

Statistical areas

CAPE COAST DIVISION

area code	group code	area	field sheet	grid-square reference	number of grid square
51	5B	Asikuma	26	4, 5	2
			28	4,5,9,10,14,15,18 - 20, 23 - 25	12
			29	1 - 3	3
			31	1,6,11,12,16-18,21-23	10
			52	3-5,9,10,13-15,18-20, 24, 25	13
			55	21	1
					41
53	5A	Foso	48	4,5,9,10,15	5
			50	15, 20, 24, 25	4
			51	1 - 9, 11	10
			52	1	1
			53	8, 12 - 25	15
			54	16,17,21,22	4
					39
55	5B	Assin	27	5, 10, 15, 20	4
			28	1-3,6-8,11-13,16,17, 21,22	13
			51	10, 14, 15, 20, 25	5
			52	2,6-8,11,12,16,17,21-23	11
					33
56	5B	Jukwa	22	4,5,8-10,13-15,18-20	11
			24	25	1
			25	1 - 19	19
			27	16 - 19, 21 - 25	9
					40
57	5A	Twifu	24	3-5,8-10,13-15,18-20,24	13
			27	1-4, 6-9, 11-14	12
			48	19, 20, 23 - 25	5
			51	12, 13, 16-19, 21 - 24	10
					40
NKAWKAW DIVISION					
60	6	Nkawkaw N. W.	95	1 - 3, 7,	4
			133	7-9,12-14,18-20,22,23,	11
					15
61	6	Nkawkaw S.E.	95	4, 5, 8-10, 13	6
			96	1	1
			133	24, 25,	2
			134	21, 22	2
					11
62	6	Kankang	96	2 - 5, 6 - 9	8
					8
63	6	Mpraeso	134	3-5,8-10,12-20,23-25	18
			136	24, 25	2
			137	1,2,6,7,11,16,21	7
					27
64	6	Abetifi	133	2 - 5, 10, 15,	6
			134	1, 2, 6, 7, 11,	5
			135	24, 25,	2
			136	11, 16, 17, 21, 22, 23,	6
					19
EASTERN REGION					
70	7B	Osino Division	96	10, 14, 15, 19, 20	5
			99	6,11-13,16-18,21-24	11
					16

.....71/

APPENDIX VII (continued)

Statistical areas

EASTERN REGION (continued)

area code	group code	area	field sheet	grid-square reference	number of grid square
71	7B	Kibi Division	94	5,9,10,14,15,19,20	7
			96	25	1
			97	1, 6, 11	3
					11
72	7C	Kwabeng Division	93	5, 10	2
			94	1 - 4, 6 - 8, 13	8
			95	14, 15, 19, 20	4
			96	11-13, 16-18, 21-24	10
					24
73	7A	Asamankese Div.	56	3 - 5, 8 - 10	6
			58	2,3,6-9,11-20,22-25	20
			59	1	1
			61	16, 21	2
					29
WESTERN DIVISION					
80	8	Dunkwa	49	3,4,7-10,12-15,17-20, 24, 25	16
			50	6 - 14, 16 - 19, 23	14
			85	24	1
					31
81	8	Tonton	46	2 - 15, 18, 19	16
			49	1, 2, 6, 11	4
			82	20, 23 - 25	4
			85	21	1
					25
82	8	Asankrangwa	42	25	1
			43	3 - 5, 9, 10, 15	6
			44	1 - 3, 6 - 8,11 - 13,	9
			45	2, 6 - 25	21
			46	16, 17, 21 - 23	5
					42
83	8	Enchi No.2	41	4,5,10,15,20,25	6
			42	1 - 24	24
			77	24	1
			78	21 - 23	3
					34
84	8	Enchi No.1	38	4, 5, 10, 15	4
			41	1-3,6-9,11-14,17-19,24	15
			74	19, 20, 24, 25	4
			77	16, 17, 21 - 23	5
					28
TRANS-VOLTA/TOGOLAND.					
90	9A	Kpeve Division	103	3-5,8-10,13-15,17-20, 22-25	17
			104	1-3, 6,7,11,12,16,17	9
			141	5,8-10,13-15,18-20,23-25	13
			142	1 - 19, 21 - 23	22
			143	5,9,10, 13-15, 18-20, 25	10
			144	1 - 25	25
			145	1-3,6-8,11-14,18-20, 25	14
			147	1,2,6,7,11,12,16,17,21-23	11
			181	5, 10, 20, 25	4
			182	1 - 25	25
			184	3, 8, 13-25	15
			185	1-3,6-8,11-13,16-18,21-23	15
			187	21 - 23	3
					183

.....91/

APPENDIX VII (continued)

Statistical areas

TRANS-VOLTA TOGOLAND (continued)

area code	group code	area	field sheet	grid-square reference	number of grid square
91	9B	Jasikan District	183	9, 10, 15	3
			184	1, 2, 4 - 7, 9 - 12	10
			187	1,6,7,11 - 13, 16 - 18	9
			221	20, 25	2
			222	1 - 25	25
			224	4,5,8-10, 13-20,22-25	17
			225	1-3,6,7,11,12,16,21	9
			227	1,2,6,7,11,12,16,17, 21 - 23	11
			262	19, 20, 24, 25	4
			265	21, 22	2
					92
RECONNAISSANCE SURVEY NOW OUTSIDE SURVEY AREA					
99	9C		61	20	1
			62	1-9,11,12,16,17,21	14
			98	14,18, 21 - 24	6
			100	8, 13, 18	3
					24

APPENDIX VIIIa.

Area Summary of Intensive Survey data available in Head Office at end September, 1955.

acres

area code	surveyed	cocoa	foodfarms	bush	forest	sparse cocoa	A-class cocoa	B-class cocoa	C-class cocoa	D-class cocoa
01	403,933.1	210,261.9	8,121.3	42,332.0	142,130.9	1,087.0	69,635.4	26,096.3	89,258.8	25,271.
02	355,725.2	120,244.7	18,449.9	117,245.8	99,095.8	689.0	39,818.6	18,744.0	50,934.6	10,747.
03	262,704.8	81,735.1	2,011.9	14,766.4	163,082.7	1,108.7	43,992.4	6,979.7	26,828.4	3,934.
04	259,881.1	86,255.6	3,700.8	11,729.1	155,878.1	2,317.5	49,210.6	10,692.3	20,373.8	5,978.
05	171,453.4	9,187.5	862.3	90.4	161,261.3	51.9	8,758.3	171.0	258.2	-
06	499,513.3	100,857.2	8,098.6	75,114.4	315,153.4	289.7	33,863.7	13,436.7	46,796.6	6,760.
07	362,464.4	99,007.3	11,781.3	159,425.4	91,172.7	1,077.7	42,112.8	8,322.0	42,819.3	5,753.
08	138,899.6	77,314.9	2,307.4	15,307.1	43,518.9	451.3	39,737.2	8,235.0	23,803.9	5,538.
09	123,514.8	40,966.8	4,729.8	56,106.9	21,378.8	332.5	12,307.3	6,549.3	19,225.2	2,885.
10	368,403.4	87,564.8	25,115.4	98,041.3	154,954.7	2,727.2	6,704.7	10,610.9	43,718.3	26,530.
11	383,716.0	79,595.4	9,421.6	23,407.9	270,969.4	321.7	16,502.8	23,106.3	29,415.1	10,471.
12	389,446.6	157,560.2	12,971.1	72,194.1	141,739.6	4,981.6	13,457.1	10,579.5	75,205.5	58,318.
13	60,475.0	22,526.2	6,797.2	22,850.5	8,301.1	-	925.8	3,002.4	9,012.1	9,585.
14	250,314.1	95,239.4	29,156.4	93,995.6	31,922.7	-	3,834.2	13,993.7	40,803.3	36,608.
20	394,509.2	170,792.6	10,925.8	48,461.5	163,276.4	1,052.9	66,534.6	7,488.1	69,467.1	27,302.
21	122,565.5	23,361.9	2,617.7	6,283.8	89,316.3	985.8	18,588.8	623.3	2,811.6	1,338.
22	146,089.5	23,508.5	1,486.7	8,184.9	112,579.0	330.4	12,139.2	2,194.4	7,318.2	1,856.
23	173,468.6	66,040.2	9,672.9	19,103.4	78,527.3	124.8	10,469.7	18,933.2	22,563.4	14,073.
24	627,750.7	100,000.0	20,600.0	373,027.8	133,337.0	785.9	17,360.0	11,204.9	51,905.7	19,529.
25	484,074.3	256,031.2	17,608.2	76,080.6	133,327.1	1,027.2	33,617.0	7,871.9	120,224.9	94,317.
26	336,140.9	177,413.3	27,795.6	91,817.8	39,114.2	-	11,837.7	24,382.3	63,072.4	78,120.
27	387,917.3	133,203.8	13,793.5	24,838.9	215,684.5	396.6	26,107.4	36,749.7	37,381.7	32,965.
28	114,281.9	64,091.7	8,637.9	14,070.7	27,481.6	-	5,690.8	12,765.7	27,599.2	18,036.
30	472,854.9	93,958.2	23,012.5	68,552.3	279,701.5	7,630.4	16,287.6	18,469.6	30,103.9	29,097.
31	85,199.3	15,415.5	7,278.0	7,391.2	41,043.0	14,071.6	1,779.2	2,191.1	4,138.3	7,306.
32	164,370.4	59,265.2	21,537.7	69,325.1	12,901.2	1,341.2	4,105.5	6,283.1	31,216.0	17,060.
33	293,769.8	125,087.9	40,312.0	113,137.4	10,216.4	5,016.1	11,357.1	7,470.9	37,620.0	68,639.
34	242,766.4	60,624.6	16,730.5	64,868.4	96,828.3	3,714.6	7,632.7	7,392.0	17,797.9	27,802.

continued ...

APPENDIX VIIIa (continued).

Area Summary of Intensive Survey data available in Head Office at end September 1955

area code	surveyed	cocoa	food farms	bush	forest	sparse cocoa	A-class cocoa	B-class cocoa	C-class cocoa	D-class cocoa
40	7,595.8	627.6	284.3	263.9	6,381.2	38.8	323.0	54.3	166.2	84.1
41	8,138.7	1,322.1	92.6	1,782.9	4,914.1	27.0	704.4	181.9	417.6	18.2
42	87,442.9	24,647.1	6,264.0	37,309.5	18,093.5	1,128.8	6485.2	3,374.1	10,609.4	4,178.4
43	66,743.5	15,932.3	2,229.1	12,796.2	35,624.1	161.8	7126.2	1,558.6	4,917.6	2,329.9
44	51,161.0	16,563.7	3,463.8	11,965.3	18,616.3	551.9	3387.5	2,005.5	8,469.5	2,701.2
45	169,446.1	36,264.9	6,923.1	31,677.0	93,090.1	1,491.0	8369.5	3,611.4	18,223.7	5,560.3
46	59,535.8	3,088.1	2,499.5	7,261.0	45,903.2	784.0	1457.6	347.4	988.2	294.9
47	21,230.2	2,944.3	1,132.6	5,943.3	11,034.8	175.2	634.6	269.2	1,251.2	789.3
48	92,222.9	22,157.3	4,660.3	22,822.9	41,710.5	871.9	6123.4	2,332.5	8,791.6	4,909.8
51	259,732.7	63,312.0	20,642.7	129,288.5	41,434.0	5,055.5	10793.8	3,285.2	29,549.7	19,683.3
53	266,652.8	26,008.8	9,051.4	36,598.8	189,971.9	4,221.9	4558.5	3,667.0	11,294.7	6,488.6
55	196,103.9	39,978.2	12,550.0	77,113.9	63,123.5	3,338.3	3871.2	2,216.9	18,034.6	15,855.5
56	29,256.6	7,077.6	2,206.5	15,399.0	2,478.6	2,094.9	1068.0	307.1	2,678.0	3,024.5
57	48,700.8	9,463.3	1,888.8	7,727.5	27,926.8	1,694.4	2970.0	1,072.5	3,077.0	2,343.8
60	115,124.8	43,111.0	13,374.6	17,203.3	38,750.1	2,685.8	4540.2	3,153.8	17,325.3	18,091.7
61	85,643.2	26,623.9	7,032.9	14,151.5	36,933.3	901.5	2846.1	1,751.2	10,382.6	11,544.0
62	10,058.2	13,969.5	5,057.5	6,020.7	34,981.6	28.8	1891.4	2,206.3	6,626.1	3,543.8
63	106,315.3	16,052.8	11,287.1	22,539.8	42,561.8	13,353.8	2293.0	728.9	7,206.2	5,760.7
64	127,196.9	8,690.2	8,472.7	75,794.1	34,276.3	1,963.6	1956.7	246.3	2,787.6	4,599.6
70	67,188.9	35,208.7	7,071.0	10,115.3	14,571.7	222.2	3102.0	4,374.0	11,411.9	15,720.8
71	45,281.0	24,275.0	3,614.5	5,333.0	11,078.4	980.1	3035.5	3,525.9	9,518.7	8,174.9
72	170,865.2	43,631.2	6,143.7	8,512.8	102,166.0	10,411.5	7055.8	6,592.2	11,050.3	18,021.9
73	155,860.3	96,906.7	24,349.7	19,219.8	12,525.8	2,658.3	5774.9	9,149.9	51,950.1	30,031.8
80	123,991.7	12,791.6	8,047.0	39,038.1	62,184.6	1,930.4	2222.6	589.6	4,902.4	5,077.0
81	77,732.2	13,249.9	2,309.4	21,397.2	39,529.2	1,156.5	3029.4	696.4	8,333.9	1,190.2	
82	22,825.3	2,433.2	1,613.2	8,591.3	9,982.4	145.2	745.2	121.5	1,360.9	683.6
83	8,352.1	1,088.4	392.6	1,801.7	4,869.9	199.3	116.2	21.1	590.0	361.1
84	13,236.4	2,349.8	438.7	3,652.5	6,531.4	264.0	218.6	124.1	869.2	1,137.9
90	1,212,102.7	120,649.1	33,943.8	932,011.2	124,202.7	1,295.9	16313.4	14,008.6	62,522.3	27,804.8
91	439,180.5	158,802.6	8,723.7	136,771.7	131,686.3	3,196.2	43525.1	21,904.3	90,376.2	2,997.0
99	87,483.0	14,307.0	5,450.0	64,700.0	2,826.0	-	165.5	152.0	1,272.0	12,717.5
	13,358,604.9	3,640,699.6	587,634.8	5,570,754.5	4,543,870.0	115,642.0	780187.7	418,771.0	1,459,590.1	882,150.8

APPENDIX VIIIb

Group Summary of Intensive Survey data available in Head Office at end September, 1955.

acres

group code	surveyed	cocoa	food	bush	forest	sparse cocoa	A	B	C	D
0A	542,832.7	287,576.8	10,428.7	57,639.1	185,649.8	1,53[illegible].3	109.372.6	34,331.3	113,062.7	30,810.2
0B	841,704.4	260,218.8	34,961.0	332,778.1	211,647.3	2,099.2	94,238.7	33,615.3	112,979.1	19,385.7
0C	1,193,552.6	278,035.4	14,673.6	101,700.3	795,375.5	3,767.8	135,825.0	31,279.7	94,257.0	16,673.7
1A	752,119.4	167,160.2	34,537.0	121,449.2	425,924.1	3,048.9	23,307.5	33,717.2	73,133.4	37,002.1
1B	700,235.7	275,325.8	48,924.7	189,040.2	181,963.4	4,981.6	18,217.1	27,575.6	125,020.9	104,512.2
2A	627,750.7	100,000.0	20,600.0	373,027.8	133,337.0	785.9	17,360.0	11,204.9	51,905.7	19,529.4
2B	268,655.0	46,870.4	4,104.4	14,468.7	201,895.3	1,316.2	30,728.0	2,817.7	10,129.8	3,194.9
2C	394,509.2	170,792.6	10,925.8	48,461.5	163,276.4	1,052.9	66,534.6	7,488.1	69,467.1	27,302.8
2D	561,385.9	199,244.0	23,466.4	43,942.3	294,211.8	521.4	36,577.1	55,682.9	59,945.1	47,038.9
2E	934,497.1	497,536.2	54,041.7	181,969.1	199,922.9	1,027.2	51,145.5	45,019.9	210,896.5	190,474.3
3A	458,140.2	184,353.1	61,849.7	182,462.5	23,117.6	6,357.3	15,462.6	13,754.0	68,836.0	86,300.5
3B	800,820.6	169,998.3	47,021.0	140,811.9	417,572.8	25,416.6	25,699.5	28,052.7	52,040.1	64,206.0
4A	138,603.9	41,210.8	9,727.8	49,274.8	36,709.8	1,680.7	9,872.7	5,379.6	19,078.9	6,879.6
4B	424,913.0	82,336.6	17,821.5	82,547.2	238,658.0	3,549.7	25,238.7	8,355.3	34,756.1	13,986.5
5A	315,353.6	35,472.1	11,740.2	44,326.3	217,898.7	5,916.3	7,528.5	4,739.5	14,371.7	8,832.4
5B	485,093.2	110,367.8	35,399.2	221,801.4	107,036.1	10,488.7	15,733.0	5,809.2	50,262.3	38,563.3
6	494,338.4	108,447.5	45,224.8	133,709.5	187,523.1	19,433.5	12,429.4	8,088.5	44,389.8	43,539.8
7A	155,860.3	96,906.7	24,349.7	19,219.8	12,525.8	2,858.3	5,774.9	9,149.9	51,950.1	30,031.8
7B	112,469.9	59,483.7	10,685.5	15,448.3	25,650.1	1,202.3	6,157.5	8,499.9	20,930.6	23,895.7
7C	170,865.2	43,631.2	6,143.7	8,512.8	102,166.0	10,411.5	7,066.8	6,592.2	11,950.3	18,021.9
8	246,137.7	31,972.9	12,890.9	74,480.8	123,097.5	3,695.6	5,914.0	1,552.7	16,056.4	8,449.8
9A	1,212,102.7	120,649.1	33,943.8	932,011.2	124,202.7	1,295.9	16,313.4	14,008.6	62,522.3	27,804.8
9B	439,180.5	158,802.6	8,723.7	136,771.7	131,686.3	3,196.2	43,525.1	21,904.3	90,376.2	2,997.0
9C	87,483.0	14,307.0	5,450.0	64,900.0	2,826.0	-	165.5	152.0	1,272.0	12,717.5
Total	12,358,604.9	3,540,699.6	587,634.8	3,570,754.5	4,543,874.0	115,642.0	780,187.7	418,771.0	1,459,590.1	882,150.8

APPENDIX VIII.

Summary of Intensive Survey available in Head Office at end September, 1955, by year of survey
(unsurveyed Forest Reserve has been omitted from this summary)

acres

area code	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	Total
01	2,186.0	-	-	-	4,903.7	70,387.2	82,928.6	81,127.9	97,149.1	65.250.6	403,933.1
02	-	-	-	-	18.0	35,890.6	67,256.3	85,380.1	119,104.8	48,075.4	355,725.2
03	-	-	-	-	-	802.7	8,277.5	41,796.7	53,277.0	158,550.9	262,704.8
04	-	-	-	-	-	9,429.1	52,503.1	85,785.7	78,482.1	33,681.1	259,881.1
05	-	-	-	-	998.1	-	5,310.0	9,066.1	150,954.6	5,124.6	171,453.4
06	-	-	-	-	-	-	121,835.3	254,654.9	99,507.1	23,516.0	499,513.3
07	-	-	-	-	-	-	79,111.4	82,631.1	131,245.6	69,476.3	362,464.4
08	-	-	-	-	-	3,541.1	4,935.8	7,082.9	49,702.3	73,637.5	138,899.6
09	-	-	-	-	-	14,062.6	15,734.0	18,403.1	34,074.1	41,241.0	123,514.8
10	1,536.8	720.2	-	1,926.0	56,821.3	82,286.3	91,932.8	102,474.7	25,123.6	288.0	363,109.7
11	631.6	60,997.5	-	-	38,815.5	64,675.3	39,379.0	71,884.5	39,193.0	1,273.1	316,849.5
12	-	2.0	-	7,015.1	55,264.5	76,605.1	50,885.4	43,374.5	156.300.0	-	389,446.6
13	16,291.5	9,785.0	9,180.1	12,199.5	6,675.7	342.7	-	-	-	-	54,474.5
14	17,804.0	32,819.0	61,386.9	104,554.5	21,957.5	11,792.2	-	-	-	-	250,314.1
20	-	-	-	2,601.2	38,273.9	57,812.3	47,614.5	54,320.5	66,822.0	123,869.8	391,314.2
21	-	-	-	-	-	-	-	6,930.9	55,777.9	59,856.7	122,565.5
22	-	-	-	-	-	-	168.5	12,675.1	133.115.9	-	145,959.5
23	19,569.6	25,636.3	13,275.3	32,926.0	28,936.8	-	-	5,921.9	838.2	-	127.104.1
24	-	31.0	2,775.7	4,434.0	80,391.9	183,562.7	183,832.3	170,129.2	2,041.1	-	627,197.9
25	-	-	48.0	1,978.0	48,988.0	99,831.4	75,711.3	74,443.1	122,410.0	54,850.5	478,260.3
26	2,372.4	31,135.9	34,650.3	121,022.3	109,770.8	35,649.2	-	-	-	-	334,600.9
27	24,059.7	16,720.1	13,938.5	94,239.5	143,077.7	83,889.8	3,719.0	2,631.4	-	-	382 275.7
28	3,646.0	24,848.9	10,504.4	9,685.7	45,017.1	4,399.1	15.7	-	-	-	98,116.9
30	-	-	-	-	48,640.8	190,533.8	190,384.6	6,290.2	6,811.4	-	442,660.8
31	-	-	-	-	28,916.4	56,090.9	-	-	-	192.0	85,199.3
32	2,621.2	-	-	-	20,772.5	133,337.0	166.5	-	-	7,473.2	164,370.4
33	-	-	-	-	27,901.0	50,602.6	85,741.5	36,309.3	25,445.7	67,749.7	293.769.8
34	-	-	-	-	13,271.3	68,250.6	79,168.7	36,500.6	45,332.6	242.6	242,766.4

continued

APPENDIX VIIIc. (continued)

Summary of Intensive Survey available in Head Office at end September, 1955, by year of survey
(unsurveyed Forest Reserve has been omitted from this summary)

area code	1946	1947	1948	1949	1950	1951	1952	1953	1954	1955	Total
40	-	-	-	-	-	-	-	1,045.0	6,212.8	338.0	7.595.8
41	-	-	-	-	-	-	4,044.4	-	863.0	3,231.3	8,138.7
42	-	-	-	-	-	-	-	18,666.7	67,522.2	-	86,188.9
43	-	-	-	-	-	-	6,853.2	42,824.6	13,631.0	3,434.7	66,743.5
44	-	-	-	-	-	-	6,036.9	20,886.0	24,238.1	-	51.161.0
45	-	-	-	-	-	-	15,241.7	56,816.3	83,329.1	2,130.0	157,517.1
46	-	-	-	-	-	-	2,484.7	44,086.7	11,671.4	1,293.0	59,535.8
47	-	-	-	-	-	-	2,881.8	14,233.5	4,114.9	-	21,230.2
48	-	-	-	-	-	-	6,625.4	7,968.3	56,141.9	22,487.3	92,222.9
51	-	-	-	-	-	-	10,690.7	55,986.2	109,917.3	83,138.5	259,732.7
53	-	-	-	-	-	-	576.0	76,519.5	130,114.1	59,443.2	266,652.8
55	-	-	-	-	-	-	194.0	33,794.0	104,451.4	57,664.5	196,103.9
56	-	-	-	-	-	-	-	-	20,376.6	8,880.0	29,256.6
57	-	-	-	-	-	-	-	3,200.2	8,324.6	37,176.0	48,700.8
60	4,451.0	27,670.3	-	6780.0	1,875.0	12,328.4	15,845.9	46,297.3	1,413.8	1,995.2	112,554.9
61	-	-	-	-	22,245.0	12,108.0	42,991.8	1,705.8	3,529.6	-	82,880.2
62	-	-	-	-	22,476.7	16,696.4	8,334.3	2,083.8	-	-	49,591.2
63	-	-	-	-	-	-	4,727.7	23,059.1	47,761.7	30,766.8	106,315.3
64	-	-	-	-	68.0	-	3,710.8	64,352.8	55,161.2	3,904.1	127,196.9
70	12,514.7	-	-	-	22,122.5	14,020.9	10,109.2	144.6	-	-	58,911.9
71	152.0	12,330.0	-	-	3,207.8	13,661.2	9,368.1	1,964.2	1,755.5	571.2	43,010.0
72	-	-	-	-	30,162.3	74,478.9	23,787.4	-	-	-	128,428.6
73	-	-	-	-	35,181.1	66,315.7	26,864.0	11,080.6	7,258.8	4,348.1	151,048.3
80	-	-	-	-	-	29.5	8,034.0	19,761.3	54,646.7	41,520.2	123,991.7
81	-	-	-	-	-	-	-	81.0	36,831.5	40,819.7	77,732.2
82	-	-	-	-	-	-	-	-	-	22,825.3	22,825.3
83	-	-	-	-	-	-	-	48.8	-	8,303.3	8,352.1
84	-	-	-	-	-	-	-	-	-	13,236.4	13,236.4
90	14,574.0	111,441.8	134,844.0	106,925.0	113,590.0	317,959.1	291,460.0	118,903.8	409.0	1,996.0	1,212,102.7
91	-	-	-	15,626.6	61,677.0	50,741.0	70,988.0	66,908.0	62,999.0	110,240.9	439,180.5
99	53,935.0	33,548.0	-	-	-	-	-	-	-	-	87,483.0
Total	176,345.5	387,686.0	280,603.2	515,811.4	1,132,[illegible]7.9	1,912,113.4	1,8[illegible]461.8	2022,252.5	2405,683.3	1394,092.7	12084,067.7

APPENDIX IXa.

Area percentage summary of Intensive survey data

code	total area in acres	Forest Reserve added	A-class cocoa	B-class cocoa	C-class cocoa	D-class cocoa	all cocoa	food farms	bush	F.R. added	other forest	sparse cocoa	condition factor
			%										
01	403,933.1	-	17.2	6.5	22.1	6.2	52.0	2.0	10.5	-	35.2	0.3	.793
02	335,725.2	-	11.2	5.3	14.3	3.0	33.8	5.2	33.0	-	27.8	0.2	.835
03	262,704.8	-	16.7	2.7	10.2	1.5	31.1	0.8	5.6	-	62.1	0.4	.834
04	259,881.1	-	18.9	4.1	7.9	2.3	33.2	1.4	4.5	-	60.0	0.9	.805
05	171,453.4	-	5.1	0.1	0.2	0.0	5.4	0.5	0.1	-	94.0	0.0	.822
06	499,513.3	-	6.8	2.7	9.3	1.4	20.2	1.6	15.0	-	63.1	0.1	.794
07	362,464.4	-	11.6	2.3	11.8	1.6	27.3	3.2	44.0	-	25.2	0.3	.829
08	136,899.6	-	28.6	5.9	17.2	4.0	55.7	1.7	11.0	-	31.3	0.3	.796
09	123,514.8	-	10.0	5.4	15.5	2.3	33.2	3.8	45.4	-	17.3	0.3	.794
10	368,403.4	5,293.7	1.8	2.9	11.9	7.2	23.8	6.8	26.6	1.5	40.6	0.7	.697
11	383,716.0	66,866.5	4.3	6.0	7.7	2.7	20.7	2.5	6.1	17.4	53.2	0.1	.743
12	389,446.6	-	3.5	2.7	19.3	15.0	40.5	3.3	18.5	-	36.4	1.3	.779
13	60,475.0	6,000.5	1.5	5.0	14.9	15.9	37.3	11.2	37.8	9.9	3.8	-	.767
14	250,314.1	-	1.5	5.6	16.3	14.6	38.0	11.6	37.6	-	12.8	-	.764
20	394,509.2	3,195.0	16.9	1.9	17.6	6.9	43.3	2.8	12.3	0.8	40.6	0.2	.777
21	122,565.5	-	15.2	0.5	2.3	1.1	19.1	2.1	5.1	-	72.9	0.8	.844
22	146,089.5	130.0	8.3	1.5	5.0	1.3	16.1	1.0	5.6	0.1	77.0	0.2	.776
23	173,468.6	46,364.5	6.1	10.9	13.0	8.1	38.1	5.6	11.0	26.7	18.6	-	.764
24	627,750.7	552.8	2.8	1.8	8.2	3.1	15.9	3.3	59.4	0.1	21.2	0.1	.814
25	484,074.3	5,814.0	7.0	1.6	24.8	19.5	52.9	3.6	15.7	1.2	26.4	0.2	.750
26	336,140.9	1,540.0	3.5	7.3	18.8	23.2	52.8	8.3	27.3	0.4	11.2	-	.762
27	387,917.3	5,641.6	6.7	9.5	9.6	8.5	34.3	3.6	6.4	1.5	54.1	0.1	.736
28	114,281.9	16,165.0	5.0	11.2	24.1	15.8	56.1	7.6	12.3	14.1	9.9	-	.787
30	472,854.9	30,194.1	3.4	3.9	6.4	6.2	19.9	4.9	14.5	6.4	52.7	1.6	.714
31	85,199.3	-	2.1	2.6	4.8	8.6	18.1	8.5	8.7	-	48.2	16.5	.738
32	164,370.4	-	2.5	3.8	19.0	10.8	36.1	13.1	42.2	-	7.8	0.8	.755
33	293,769.8	-	3.9	2.5	12.8	23.4	42.6	13.7	38.5	-	3.5	1.7	.813
34	242,766.4	-	3.2	3.0	7.3	11.5	25.0	6.9	26.7	-	39.9	1.5	.698

continued

continued

APPENDIX IXa. (continued)

Area percentage summary of Intensive survey data

%

code	total area in acres	Forest Reserve added	A-class cocoa	B-class cocoa	C-class cocoa	D-class cocoa	all cocoa	Food farms	bush	F.R. added	other forest	sparse cocoa	condition factor
40	7,595.8	-	4.3	0.7	2.2	1.1	8.3	3.7	3.5	-	84.0	0.5	.753
41	8,138.7	-	8.7	2.2	5.1	0.2	16.2	1.2	21.9	-	60.4	0.3	.795
42	87,442.9	1,254.0	7.4	3.9	12.1	4.8	28.2	7.1	42.7	1.4	19.3	1.3	.749
43	66,743.5	-	10.7	2.3	7.4	3.5	23.9	3.3	19.2	-	53.4	0.2	.770
44	51,161.0	-	6.6	3.9	16.6	5.3	32.4	6.8	23.4	-	36.4	1.0	.757
45	169,446.1	11,929.0	5.2	2.1	10.8	3.3	21.4	4.1	18.7	7.0	47.9	0.9	.753
46	59,535.8	-	2.4	0.6	1.7	0.5	5.2	4.2	12.2	-	77.1	1.3	.769
47	21,230.2	-	3.0	1.3	5.9	3.7	13.9	5.3	28.0	-	52.0	0.8	.743
48	92,222.9	-	6.7	2.5	9.5	5.3	24.0	5.2	24.7	-	45.2	0.9	.785
51	259,732.7	-	4.1	1.3	11.4	7.6	24.4	7.9	49.8	-	16.0	1.9	.744
53	266,652.8	-	1.7	1.4	4.2	2.4	9.7	3.7	13.7	-	71.3	1.6	.587
55	196,103.9	-	2.0	1.1	9.2	8.1	20.4	6.4	39.3	-	32.2	1.7	.700
56	29,256.6	-	3.7	1.0	9.2	10.3	24.2	7.5	52.6	-	8.5	7.2	.698
57	48,700.8	-	6.1	2.2	6.3	4.8	19.4	3.9	15.9	-	57.3	3.5	.651
60	115,124.8	2,569.9	4.0	2.7	15.1	15.7	37.5	11.6	14.9	2.2	31.5	2.3	.738
61	85,643.2	2,763.0	3.4	2.1	12.1	13.5	31.1	8.2	16.5	3.2	39.9	1.1	.685
62	60,058.2	10,467.0	2.7	3.7	11.0	5.9	23.3	8.4	10.0	17.4	40.8	0.1	.742
63	106,315.3	-	2.2	0.7	6.8	5.4	15.1	10.6	21.2	-	40.1	13.0	.698
64	127,196.9	-	0.8	0.2	2.2	3.6	6.8	6.7	58.0	-	27.0	1.5	.693
70	67,188.9	8,277.0	4.6	7.4	17.0	23.4	52.4	10.5	15.1	12.3	9.4	0.3	.744
71	45,281.0	2,271.0	6.7	7.8	21.0	18.1	53.6	8.0	11.8	5.0	19.4	2.2	.681
72	170,865.2	42,436.6	4.1	3.9	7.0	10.5	25.5	3.6	5.0	24.8	35.0	6.1	.754
73	155,860.3	4,812.0	3.7	5.9	33.3	19.3	62.2	15.6	12.3	3.1	4.9	1.9	.692
80	123,991.7	-	1.8	0.5	3.9	4.1	10.3	6.5	31.5	-	50.1	1.6	.659
81	77,732.2	-	3.9	0.9	10.7	1.5	17.0	3.1	27.5	-	50.9	1.5	.790
82	22,825.3	-	1.4	0.5	6.0	3.0	10.9	7.1	37.6	-	43.7	0.7	.737
83	8,352.1	-	1.4	0.2	7.1	4.3	13.0	4.7	21.6	-	58.3	2.4	.724
84	13,236.4	-	1.7	0.9	6.6	8.6	17.8	3.3	27.6	-	49.3	2.0	.680
90	1,212,102.7	-	1.3	1.2	5.2	2.3	10.0	2.8	76.9	-	10.2	0.1	.764
91	439,180.5	-	9.9	5.0	20.6	0.7	36.2	2.0	31.1	-	30.0	0.7	.803
99	87,483.0	-	0.2	0.2	1.5	14.5	16.4	6.2	74.2	-	3.2	-	.529

APPENDIX IXb.

Group percentage summary of Intensive survey data

%

code	total area in acres	Forest Reserve added	A-class cocoa	B-class cocoa	C-class cocoa	D-class cocoa	all cocoa	Food farms	bush	F.R. added	other forest	sparse cocoa	condition factor
0A	542,832.7	-	20.2	6.3	20.8	5.7	53.0	1.9	10.6	-	34.2	0.3	.794
0B	841,704.4	-	11.2	4.0	13.4	2.3	30.9	4.1	39.5	-	25.2	0.3	.826
0C	1,193,552.6	-	11.4	2.6	7.9	1.4	23.3	1.2	8.5	-	66.7	0.3	.810
1A	752,119.4	72,160.2	3.1	4.5	9.7	4.9	22.2	4.6	16.2	9.6	47.0	0.4	.724
1B	700,235.7	6,000.5	2.6	3.9	17.9	14.9	39.3	7.0	27.0	0.9	25.1	0.7	.773
2A	627,750.7	552.8	2.8	1.8	8.2	3.1	15.9	3.3	59.4	0.1	21.2	0.1	.814
2B	268,655.0	130.0	11.4	1.0	3.8	1.2	17.4	1.5	5.4	0.1	75.1	0.5	.810
2C	394,509.2	3,195.0	16.9	1.9	17.6	6.9	43.3	2.8	12.3	0.8	40.6	0.2	.777
2D	561,385.9	52,006.1	6.5	9.9	10.7	8.4	35.5	4.2	7.8	9.3	43.1	0.1	.759
2E	934,497.1	23,519.0	5.5	4.8	22.5	20.4	53.2	5.8	19.5	2.5	18.9	0.1	.759
3A	458,140.2	-	3.4	3.0	15.0	18.8	40.2	13.5	39.8	-	5.1	1.4	.797
3B	800,820.6	30,194.1	3.2	3.5	6.5	8.0	21.2	5.9	17.6	3.7	48.4	3.2	.711
4A	138,603.9	1,254.0	7.1	3.9	13.7	5.0	29.7	7.0	35.6	0.9	25.6	1.2	.752
4B	424,913.0	11,929.0	5.9	2.0	8.2	3.3	19.4	4.2	19.4	2.8	53.4	0.8	.766
5A	315,353.6	-	2.4	1.5	4.5	2.8	11.2	3.7	14.1	-	69.1	1.9	.604
5B	485,093.2	-	3.2	1.2	10.4	7.9	22.7	7.3	45.7	-	22.1	2.2	.725
6	494,338.4	15,799.9	2.5	1.6	9.0	8.8	21.9	9.2	27.1	3.2	34.7	3.9	.716
7A	155,860.3	4,812.0	3.7	5.9	33.3	19.3	62.2	15.6	12.3	3.1	4.9	1.9	.692
7B	112,469.9	10,548.0	5.5	7.6	18.6	21.2	52.9	9.5	13.7	9.4	13.4	1.1	.718
7C	170,865.2	42,436.6	4.1	3.9	7.0	10.5	25.5	3.6	5.0	24.8	35.0	6.1	.754
8	246,137.7	-	2.4	0.6	6.5	3.5	13.0	5.2	30.3	-	50.0	1.5	.726
9A	1,212,102.7	-	1.3	1.2	5.2	2.3	10.0	2.8	76.9	-	10.2	0.1	.764
9B	439,180.5	-	9.9	5.0	20.6	0.7	36.2	2.0	31.1	-	30.0	0.7	.803
9C	87,483,0	-	0.2	0.2	1.5	14.5	16.4	6.2	74.2	-	3.2	-	.520
All Areas	12,358,604.9	274,537.2	6.3	3.4	11.8	7.1	28.6	4.8	28.9	2.2	34.6	0.9	.767

APPENDIX X.

Recorded acreage of cleared land and township included with Bush in Intensive Survey summary.

Area	cleared land	township	Area	cleared land	township
01	591.6	-	51	187.3	27.0
02	303.2	-	53	3.7	-
03	217.0	-	55	22.2	76.5
04	407.2	-	56	-	13.2
05	10.1	-	57	2.0	2.8
06	551.7	-			
07	381.7	-	60	11.6	-
08	190.7	-	61	-	-
09	107.5	-	62	61.0	-
			63	-	-
10	2,527.6	-	64	-	-
11	243.2	-			
12	507.8	-	70	-	-
13	233.1	-	71	5.2	31.6
14	2,447.0	-	72	33.8	40.1
			73	37.9	46.8
20	1,260.8	-			
21	74.5	-	80	-	-
22	39.0	-	81	-	-
23	517.7	-	82	-	-
24	2,501.1	-	83	-	-
25	3,824.4	-	84	-	-
26	4,584.4	-			
27	568.3	-	90	395.8	4,285.2
28	252.8	-	91	147.0	404.4
30	6.3	4.0	99	-	-
31	43.7	41.0			
32	-	25.0	Total	23,338.9	5,108.3
33	18.5	110.7			
34	-	-			
40	-	-			
41	-	-			
42	8.1	-			
43	-	-			
44	-	-			
45	7.3	-			
46	5.1	-			
47	-	-			
48	-	-			

APPENDIX XI.

Percentage of area Intensively Surveyed, condition-factor and estimated year planting commenced.

area code	percentage surveyed	condition-factor	estimated year planting commenced.
01	98.0	.793	1915
02	38.7	.835	1920
03	77.2	.834	1920
04	59.9	.805	1920
05	93.7	.822	1925
06	92.2	.794	1919
07	32.9	.829	1918
08	65.3	.796	1915
09	61.3	.794	1916
10	100.0	.697	1910
11	100.0	.743	1910
12	100.0	.779	1910
13	100.0	.767	1900
14	100.0	.764	1905
20	97.5	.777	1911
21	77.4	.844	1918
22	100.0	.776	1920
23	64.5	.764	1908
24	95.9	.814	1914
25	80.1	.750	1908
26	100.0	.762	1900
27	100.0	.756	1903
28	100.0	.787	1908
30	100.0	.714	1910
31	100.0	.738	1900
32	85.5	.765	1912
33	83.1	.813	1900
34	98.9	.698	1903
40	5.5	.753	1919
41	1.0	.795	1922
42	81.6	.749	1914
43	51.0	.770	1915
44	72.9	.757	1914
45	51.4	.753	1918
46	72.6	.769	1918
47	19.7	.743	1913
48	33.6	.786	1916
51	83.8	.744	1910
53	90.3	.587	1914
55	77.7	.700	1910
56	9.5	.698	1905
57	15.9	.651	1913
60	100.0	.738	1900
61	100.0	.685	1900
62	100.0	.742	1910
63	54.7	.698	1910
64	95.4	.693	1900
70	100.0	.744	1900
71	86.2	.681	1900
72	95.0	.754	1900
73	100.0	.692	1910
80	52.4	.659	1903
81	41.0	.790	1918
82	7.1	.787	1915
83	3.2	.724	1915
84	6.2	.660	1905
90	97.5	.764	1910
91	73.7	.803	1920
99	100.0	.520	1885
combined	68.5	.767	-

APPENDIX XIIa

Analysis of Intensive Survey data by year of survey. Post-war plantings higher than pre-war level. (area estimated at 7,507,000 acres)

		group code							total (a)
		0A	0B	0C	2B	2C	4B	9B	
% of total	1946	0.4	-	-	-	-	-	-	0.1
acres sur-	1947	-	-	-	-	-	-	-	-
veyed each	1948	-	-	-	-	-	-	-	-
year	1949	-	-	-	-	0.7	-	3.6	0.4
	1950	0.9	-	0.1	-	9.8	-	14.1	2.6
	1951	13.6	5.9	0.9	-	14.8	-	11.6	5.9
	1952	16.2	19.3	15.7	0.1	12.1	9.0	16.2	14.5
	1953	16.3	22.1	32.8	7.3	13.9	40.4	15.2	23.8
	1954	27.0	33.8	32.0	70.3	17.1	42.6	14.3	32.0
	1955	25.6	18.9	18.5	22.3	31.6	8.0	25.1	20.7
per 100 acres surveyed									
all cocoa	1946	-	-	-	-	-	-	-	-
	1947	-	-	-	-	-	-	-	-
	1948	-	-	-	-	-	-	-	-
	1949	-	-	-	-	40.4	-	48.1	47.0
	1950	41.9	-	-	-	44.9	-	39.2	41.1
	1951	64.9	29.0	53.7	-	67.3	-	54.7	55.6
	1952	58.5	37.6	26.7	-	69.3	28.2	31.4	32.9
	1953	60.5	35.3	26.1	22.1	56.0	18.8	37.8	32.1
	1954	49.6	27.6	22.0	16.4	58.0	19.4	49.7	28.3
	1955	43.1	25.5	16.4	19.1	9.2	19.9	18.5	22.0
planted before 1915	D 46	-	-	-	-	-	-	-	-
1916	D 47	-	-	-	-	-	-	-	-
1917	D 48	-	-	-	-	-	-	-	-
1918	D 49	-	-	-	-	27.3	-	1.8	5.4
1919	D 50	17.6	-	-	-	22.8	-	0.7	9.5
1920	D 51	14.4	6.7	7.1	-	18.4	-	1.2	10.7
1921	D 52	9.5	4.9	2.7	-	5.7	6.3	0.3	3.8
1922	D 53	4.1	2.3	1.7	2.0	5.2	3.0	1.6	2.4
1923	D 54	2.4	0.9	0.9	1.1	1.1	3.5	0.4	1.4
1924	D 55	2.7	0.8	0.4	1.2	0.8	1.6	0.1	1.0
planted during 15 years 16-30	C 46	-	-	-	-	-	-	-	-
17-31	C 47	-	-	-	-	-	-	-	-
18-32	C 48	-	-	-	-	-	-	-	-
19-33	C 49	-	-	-	-	12.8	-	34.6	31.5
20-34	C 50	15.6	-	-	-	20.8	-	26.4	23.7
21-35	C 51	32.7	18.2	14.0	-	43.7	-	36.6	32.4
22-36	C 52	27.3	21.4	8.5	-	36.2	9.5	17.7	15.6
23-37	C 53	26.8	13.5	10.6	6.1	17.3	8.1	23.2	13.4
24-38	C 54	14.9	9.6	6.9	3.9	9.7	8.7	27.7	9.4
25-39	C 55	13.4	10.4	3.9	2.5	2.3	7.2	4.1	6.5
planted during 9 years 31-38	B 46	-	-	-	-	-	-	-	-
32-39	B 47	-	-	-	-	-	-	-	-
33-40	B 48	-	-	-	-	-	-	-	-
34-41	B 49	-	-	-	-	0.2	-	8.7	7.5
35-42	B 50	5.0	-	-	-	1.0	-	8.5	5.6
36-43	B 51	9.1	3.0	6.7	-	8.9	-	8.9	5.8
37-44	B 52	9.7	5.8	3.4	-	5.0	4.3	5.1	4.6
38-45	B 53	7.5	5.8	2.9	2.7	4.0	1.8	2.9	3.6
39-46	B 54	4.6	3.2	2.5	1.0	2.1	1.8	5.5	2.7
	A 46	-	-	-	-	-	-	-	-
40-47	B 55	3.9	2.6	1.6	0.5	0.5	1.7	1.6	1.9
	A 47	-	-	-	-	-	-	-	-
41-48	A 48	-	-	-	-	-	-	-	-
42-49	A 49	-	-	-	-	0.1	-	3.0	2.6
43-50	A 50	3.7	-	-	-	0.3	-	3.6	2.3
44-51	A 51	8.7	1.1	25.9	-	4.5	-	8.0	6.7
45-52	A 52	12.0	5.5	12.1	-	22.4	8.1	8.3	8.9
46-53	A 53	22.1	14.5	10.9	11.3	29.5	5.9	10.1	12.7
47-54	A 54	27.7	13.9	11.7	10.4	45.1	5.4	16.1	14.8
48-55	A 55	23.1	11.7	10.5	14.9	5.6	8.5	12.7	12.6

APPENDIX XIIb.

Analysis of Intensive Survey data by year of survey. Post-war plantings similar to pre-war level. (area estimated at 3,566 acres)

			group code					total (b)
			1A	3B	4A	5A	8	
% of total acres surveyed each year		1946	0.3	-	-	-	-	0.1
		1947	9.1	-	-	-	-	2.9
		1948	-	-	-	-	-	-
		1949	0.3	-	-	-	-	0.1
		1950	14.1	11.8	-	-	-	8.7
		1951	21.6	40.9	-	-	-	21.5
		1952	19.3	35.0	4.4	0.2	3.3	19.3
		1953	25.6	5.5	28.8	25.3	8.1	16.6
		1954	9.5	6.7	66.8	43.9	37.1	20.4
		1955	0.2	0.1	-	30.6	51.5	10.5
per 100 acres surveyed.								
all cocoa		1946	14.8	-	-	-	-	14.8
		1947	19.0	-	-	-	-	19.0
		1948	-	-	-	-	-	-
		1949	30.9	-	-	-	-	30.9
		1950	34.4	17.1	-	-	-	26.0
		1951	32.7	25.4	-	-	-	27.7
		1952	25.1	17.8	33.7	-	15.4	20.3
		1953	16.1	44.7	34.4	13.6	15.5	21.8
		1954	19.1	13.9	27.9	10.5	12.6	16.3
		1955	-	-	-	10.3	12.7	11.7
planted before	1915	D 46	3.9	-	-	-	-	3.9
	1916	D 47	1.6	-	-	-	-	1.6
	1917	D 48	-	-	-	-	-	-
	1918	D 49	12.1	-	-	-	-	12.1
	1919	D 50	11.1	6.5	-	-	-	8.9
	1920	D 51	9.5	9.6	-	-	-	9.6
	1921	D 52	4.1	5.7	11.2	-	2.1	5.2
	1922	D 53	1.9	26.9	7.0	4.5	7.3	6.4
	1923	D 54	3.7	2.2	3.7	2.2	2.9	2.9
	1924	D 55	-	-	-	2.3	3.3	2.9
planted during 15 years	16-30	C 46	9.6	-	-	-	-	9.6
	17-31	C 47	10.4	-	-	-	-	10.4
	18-32	C 48	-	-	-	-	-	-
	19-33	C 49	17.6	-	-	-	-	17.6
	20-34	C 50	15.1	4.8	-	-	-	10.1
	21-35	C 51	15.0	7.1	-	-	-	9.6
	22-36	C 52	11.4	6.9	19.2	-	11.8	8.6
	23-37	C 53	6.2	10.3	16.8	5.8	6.2	7.8
	24-38	C 54	5.9	4.3	12.3	4.7	6.4	6.8
	25-39	C 55	-	-	-	3.4	6.3	5.1
planted during 8 years	31-38	B 46	1.2	-	-	-	-	1.2
	32-39	B 47	6.1	-	-	-	-	6.1
	33-40	B 48	-	-	-	-	-	-
	34-41	B 49	1.2	-	-	-	-	1.2
	35-42	B 50	6.0	3.0	-	-	-	4.5
	36-43	B 51	5.2	4.7	-	-	-	4.8
	37-44	B 52	4.5	2.9	1.4	-	0.3	3.3
	38-45	B 53	4.7	2.9	4.9	1.5	0.9	3.6
	39-46	B 54	3.6	3.3	3.7	1.6	0.8	2.4
		A 46	0.1	-	-	-	-	0.1
	40-47	B 55	-	-	-	1.2	0.5	0.8
		A 47	0.9	-	-	-	-	0.9
	41-48	A 48	-	-	-	-	-	-
	42-49	A 49	-	-	-	-	-	0.0
	43-50	A 50	2.2	2.8	-	-	-	2.5
	44-51	A 51	3.0	4.0	-	-	-	3.7
	45-52	A 52	5.1	2.3	1.9	-	1.2	3.2
	46-53	A 53	3.3	4.6	5.7	1.8	1.1	3.2
	47-54	A 54	5.9	4.1	8.2	2.0	2.5	4.2
	48-55	A 55	-	-	-	3.4	2.6	2.9

APPENDIX XIIc.

Analysis of Intensive Survey data by year of survey. Post-war plantings lower than pre-war level. (area estimated at 5,882 acres)

		group code							total (c)
		1B	2A	2D	2E	5B	6	9A	
% of total acres surveyed each year	1946	4.9	-	8.6	0.7	-	0.9	1.2	2.1
	1947	6.1	-	8.3	6.1	-	5.8	9.2	5.7
	1948	10.2	0.5	5.3	5.0	-	-	11.1	5.7
	1949	17.8	[illegible]	25.0	14.6	-	0.1	8.8	10.1
	1950	12.1	12.6	33.7	22.4	-	9.8	9.4	14.2
	1951	12.8	29.3	16.5	15.3	-	8.6	26.2	17.4
	1952	7.3	29.3	0.7	8.3	2.2	15.8	24.1	14.1
	1953	6.3	27.1	1.7	8.2	18.5	28.7	9.8	13.1
	1954	22.5	0.3	0.2	13.4	48.4	22.6	-	12.7
	1955	-	-	-	6.0	30.9	7.7	0.2	4.9
per 100 acres surveyed.									
all cocoa	1946	33.6	-	44.7	62.1	-	57.2	4.0	36.8
	1947	38.5	-	48.6	56.8	-	51.2	2.9	30.8
	1948	44.1	84.1	60.5	58.2	-	-	6.0	30.0
	1949	39.0	80.1	52.4	63.7	-	-	14.9	44.2
	1950	41.6	21.2	27.5	53.5	-	34.6	9.4	33.6
	1951	55.1	17.4	29.0	58.0	-	28.1	12.2	27.7
	1952	59.0	17.6	55.7	67.9	25.5	34.7	7.3	24.0
	1953	49.1	6.7	26.7	52.8	39.4	17.6	18.1	24.2
	1954	21.1	65.8	-	42.8	22.1	8.5	-	23.7
	1955	-	-	-	33.5	13.5	11.7	9.5	17.7
planted before	1915 D 46	15.1	-	14.3	18.0	-	32.9	3.2	14.0
	1916 D 47	9.9	-	17.8	21.2	-	26.1	1.5	11.6
	1917 D 48	12.6	46.7	21.8	27.5	-	-	3.1	11.7
	1918 D 49	21.1	35.6	9.5	24.6	-	-	4.1	15.5
	1919 D 50	14.3	7.6	5.5	23.3	-	15.4	2.2	12.1
	1920 D 51	22.7	3.4	5.0	28.7	-	10.6	2.3	9.7
	1921 D 52	21.7	1.8	27.7	29.0	16.3	14.1	1.1	7.6
	1922 D 53	17.7	0.3	7.7	12.8	12.8	6.0	3.5	6.6
	1923 D 54	5.9	23.9	-	8.9	7.4	2.8	-	6.6
	1924 D 55	-	-	-	4.6	5.2	3.7	-	4.8
planted during 15 years	16-30 C 46	13.3	-	17.3	18.9	-	12.6	0.8	13.5
	17-31 C 47	14.9	-	18.4	17.5	-	20.7	3.1	11.0
	18-32 C 48	18.5	21.6	19.0	14.3	-	-	2.1	10.0
	19-33 C 49	15.5	40.8	14.4	24.0	-	-	9.5	16.4
	20-34 C 50	20.2	10.4	8.6	22.4	-	10.3	5.4	13.8
	21-35 C 51	24.2	11.1	5.8	25.6	-	12.3	6.2	12.5
	22-36 C 52	30.3	8.1	12.2	31.7	7.8	15.5	3.4	11.2
	23-37 C 53	27.8	3.0	12.2	28.6	20.8	7.5	10.2	12.5
	24-38 C 54	10.2	40.6	-	20.9	9.7	4.0	-	11.1
	25-39 C 55	-	-	-	17.5	5.3	5.3	8.4	8.0
planted during 8 years	31-38 B 46	3.8	-	8.1	18.2	-	11.1	-	6.2
	32-39 B 47	9.8	-	8.7	10.1	-	3.9	0.2	5.3
	33-40 B 48	10.3	13.5	12.9	11.5	-	-	0.6	6.1
	34-41 B 49	2.1	3.1	16.8	10.8	-	-	1.1	8.0
	35-42 B 50	5.5	2.9	8.2	5.5	-	4.2	1.0	5.1
	36-43 B 51	5.2	1.7	10.8	2.4	-	2.9	1.8	3.2
	37-44 B 52	2.4	2.3	4.4	0.8	0.5	1.6	1.0	1.5
	38-45 B 53	1.7	0.6	1.1	1.3	2.0	1.0	1.4	1.2
	39-46 B 54	0.7	0.2	-	1.4	1.5	0.4	-	1.1
	A 46	1.4	-	5.0	7.0	-	0.6	-	3.1
	40-47 B 55	-	-	-	1.6	0.3	0.6	-	0.7
	A 47	3.9	-	3.7	8.0	-	0.5	0.1	2.9
	41-48 A 48	2.7	2.3	6.8	4.9	-	-	0.2	2.2
	42-49 A 49	0.3	0.6	11.7	4.3	-	-	0.2	4.3
	43-50 A 50	1.6	0.3	5.2	2.3	-	4.7	0.8	2.6
	44-51 A 51	3.0	1.2	7.4	1.3	-	2.3	1.9	2.3
	45-52 A 52	4.6	5.4	11.4	6.4	0.9	3.5	1.8	3.7
	46-53 A 53	1.9	2.8	5.7	10.1	3.8	3.1	3.0	3.9
	47-54 A 54	4.3	1.1	-	11.6	3.5	1.3	-	4.9
	48-55 A 55	-	-	-	9.8	2.7	2.1	0.2	4.2

APPENDIX XIId.

Analysis of Intensive Survey data by year of survey. Inadequate data for relating post-war and pre-war plantings level. (area estimated at 1,093 acres)

			group code					total (d)
			3A /	7A	7B	7C	9C	
% of total acres surveyed each year		1946	0.6	-	12.4	-	61.7	7.5
		1947	-	-	12.1	-	38.3	4.9
		1948	-	-	-	-	-	-
		1949	-	-	-	-	-	-
		1950	10.6	23.3	24.8	23.5	-	15.0
		1951	40.1	43.9	27.2	58.0	-	38.0
		1952	18.8	17.8	19.1	18.5	-	16.8
		1953	7.9	7.3	2.1	-	-	5.4
		1954	5.6	4.8	1.7	-	-	3.7
		1955	16.4	2.9	0.6	-	-	8.7
per 100 acres surveyed.								
all cocoa		1946	-	-	65.1	-	13.6	23.1
		1947	-	-	35.7	-	20.7	24.7
		1948	-	-	-	-	-	-
		1949	-	-	-	-	-	-
		1950	71.3	55.6	56.4	42.1	-	58.4
		1951	40.9	67.0	62.7	30.6	-	45.3
		1952	34.7	70.1	67.1	34.3	-	44.7
		1953	62.0	64.2	73.6	-	-	63.0
		1954	58.1	71.9	-	-	-	59.7
		1955	9.2	39.4	-	-	-	10.8
planted before	11915	D 46	-	-	21.2	-	12.7	14.0
	1916	D 47	-	-	15.1	-	17.5	16.9
	1917	D 48	-	-	-	-	-	-
	1918	D 49	-	-	-	-	-	-
	1919	D 50	33.1	21.4	25.2	20.5	-	25.9
	1920	D 51	15.9	23.9	27.4	11.5	-	17.3
	1921	D 52	21.2	10.8	26.8	13.9	-	19.0
	1922	D 53	42.5	15.4	5.1	-	-	34.9
	1923	D 54	20.2	15.2	-	-	-	18.2
	1924	D 55	2.7	21.8	-	-	-	3.7
planted during 15 years	16-30	C 46	-	-	20.5	-	0.6	4.4
	17-31	C 47	-	-	6.6	-	2.8	3.8
	18-32	C 48	-	-	-	-	-	-
	19-33	C 49	-	-	-	-	-	-
	20-34	C 50	28.5	19.6	17.9	6.8	-	19.7
	21-35	C 51	18.3	35.3	20.7	10.2	-	20.0
	22-36	C 52	9.1	47.2	29.8	9.7	-	18.3
	23-37	C 53	12.4	40.2	46.5	-	-	20.1
	24-38	C 54	22.2	52.0	-	-	-	28.7
	25-39	C 55	4.2	16.0	-	-	-	4.9
planted during 8 years	31-38	B 46	-	-	12.3	-	0.1	2.5
	32-39	B 47	-	-	4.4	-	0.3	1.4
	33-40	B 48	-	-	-	-	-	-
	34-41	B 49	-	-	-	-	-	-
	35-42	B 50	6.1	7.1	8.3	5.7	-	6.7
	36-43	B 51	4.1	5.2	9.9	5.3	-	5.0
	37-44	B 52	2.0	8.3	6.5	3.7	-	3.9
	38-45	B 53	1.8	5.4	13.0	-	-	3.0
	39-46	B 54	2.1	4.1	-	-	-	2.5
		A 46	-	-	11.1	-	0.2	2.2
	40-47	B 55	0.4	1.5	-	-	-	0.5
		A 47	-	-	9.6	-	0.1	2.7
	41-48	A 48	-	-	-	-	-	-
	42-49	A 49	-	-	-	-	-	-
	43-50	A 50	3.6	7.5	5.0	9.1	-	6.1
	44-51	A 51	2.6	2.6	4.7	3.6	-	3.0
	45-52	A 52	2.4	3.8	4.0	7.0	-	3.5
	46-53	A 53	5.3	3.2	9.0	-	-	5.0
	47-54	A 54	13.6	0.6	-	-	-	10.3
	48-55	A 55	1.9	0.1	-	-	-	1.7

/ Data for area 33 appears unreliable.

[illegible] and optimum-equivalent acreages as percentage of acreage surveyed each year.

	year	(a) increasing areas A	B	C	D	opteq	(b) static area A	B	C	D	opteq	(c) decreasing areas A	B	C	D	opteq	(d) indeterminate [illegible] A	B	C	D	opteq
uncorrected data	1946						0.1	0.2	9.6	3.9	13.2	3.1	6.2	13.5	14.0	27.3	2.2	2.5	4.4	14.0	16.5
	1947						0.9	6.1	10.5	1.6	14.6	2.9	5.3	11.0	11.6	22.5	2.7	1.4	3.8	16.9	17.6
	1948											2.2	6.1	10.0	11.7	21.9					
	1949	3.6	7.5	31.5	5.4	39.2	0.0	1.2	17.6	12.1	27.6	4.3	8.0	16.4	15.5	32.2					
	1950	2.3	5.6	23.7	9.5	33.7	2.5	4.5	10.1	8.9	19.1	2.6	5.1	13.8	12.1	25.6	6.4	6.7	19.7	25.9	43.0
	1951	6.7	5.8	32.4	10.7	43.4	3.7	4.8	9.6	9.6	19.3	2.3	3.2	12.5	9.7	21.5	3.0	5.0	20.0	17.3	35.8
	1952	8.9	4.6	15.6	3.8	20.7	3.2	3.3	8.6	5.2	14.2	3.7	1.5	11.2	7.6	17.8	3.5	3.9	18.3	19.0	34.9
	1953	12.7	3.6	13.4	2.4	16.9	3.2	3.6	7.8	6.4	14.4	3.9	1.2	12.5	6.6	18.2	5.0	3.0	20.1	34.9	48.7
	1954	14.8	2.7	9.4	1.4	11.7	4.2	2.4	6.8	2.9	10.2	4.9	1.1	11.1	6.6	16.8	10.3	2.5	28.7	18.2	44.0
	1955	12.6	1.9	6.5	1.0	8.2	2.9	0.8	5.1	2.9	7.7	4.2	0.7	8.0	4.8	12.1	1.7	0.5	4.9	3.7	8.8
data corrected to C+D=constant	1946						0.2	1.2	9.9	4.0	13.6	2.4	5.0	10.8	11.1	21.8	4.3	4.6	8.4	26.7	31.3
	1947						1.0	7.0	12.1	1.9	16.8	2.7	5.1	10.7	11.2	21.8	4.5	2.3	6.5	28.7	29.9
	1948											2.2	6.2	10.1	11.8	22.2					
	1949	1.1	3.2	13.3	2.3	16.6	0.0	0.5	8.3	5.7	13.0	2.9	5.5	11.3	10.6	22.1					
	1950	1.1	2.6	11.2	4.5	15.9	1.9	3.3	7.4	6.5	14.0	2.2	4.3	11.7	10.2	21.6	4.7	5.1	15.2	20.0	33.1
	1951	2.4	2.1	11.8	3.9	15.8	2.7	3.5	7.0	7.0	14.1	2.3	3.1	12.4	9.5	21.2	2.8	4.8	18.8	16.3	33.7
	1952	7.2	3.7	12.5	2.4	16.1	3.2	3.4	8.7	5.3	14.4	4.3	1.7	13.0	8.7	20.6	3.3	3.6	17.3	18.0	33.0
	1953	12.6	3.6	13.2	2.4	16.7	3.2	3.5	7.7	6.3	14.2	4.4	1.4	14.3	7.6	20.9	3.2	2.0	12.8	22.3	31.1
	1954	21.5	3.9	13.6	2.1	17.0	6.1	3.4	9.8	4.2	14.6	6.0	1.3	15.8	8.1	20.7	7.7	1.8	21.5	13.7	33.0
	1955	26.3	4.0	13.6	2.1	17.1	5.2	1.4	8.9	5.1	13.5	7.2	1.1	13.7	8.2	20.6	7.2	2.0	19.9	15.2	32.7
assumed pattern lower death-rate	1946						1.7	4.8	8.2	2.4	12.3	1.6	6.1	13.4	4.8	20.0	1.5	6.9	19.2	21.8	39.4
	1947						1.3	4.8	8.3	2.7	12.6	1.2	6.0	13.5	5.2	20.3	1.3	6.4	18.3	22.6	38.9
	1948						1.2	4.7	8.4	3.1	13.0	1.3	5.7	13.5	5.8	20.6	1.3	5.9	17.5	23.1	38.2
	1949	2.8	7.2	11.7	1.5	16.2	1.3	4.4	8.5	3.4	13.2	1.8	5.1	13.5	6.2	20.7	1.8	5.0	16.8	23.4	37.4
	1950	4.3	6.3	12.2	2.0	16.7	1.7	3.9	8.6	3.7	13.3	2.5	4.3	13.4	6.7	20.6	2.4	4.2	16.2	23.7	36.6
	1951	6.2	5.4	12.6	2.6	17.1	2.2	3.4	8.7	4.0	13.4	3.3	3.6	13.4	7.1	20.6	3.2	3.3	15.8	24.1	36.1
	1952	8.4	4.5	13.0	3.2	17.6	2.9	2.8	8.8	4.2	13.4	4.1	2.9	13.2	7.7	20.5	4.0	2.5	15.2	24.0	35.1
	1953	10.8	3.6	13.3	3.9	18.0	3.7	2.2	8.9	4.4	13.3	4.9	2.2	13.0	8.1	20.3	4.7	1.9	14.7	24.1	34.4
	1954	13.2	2.8	13.6	4.6	18.5	4.4	1.7	9.0	4.7	13.4	5.6	1.6	12.7	8.6	20.1		1.5	14.1	24.1	33.6
	1955	13.4	2.2	13.9	5.3	19.0	5.0	1.3	9.0	4.9	13.4	6.1	1.2	12.4	9.2	20.1		1.3	13.4	24.0	32.7
assumed pattern higher death-rate	1946						1.7	4.8	7.9	1.9	11.6	1.6	6.1	13.1	3.9	18.9	1.5	6.9	18.5	16.4	34.5
	1947						1.3	4.8	8.0	2.1	11.8	1.2	6.0	13.1	4.2	19.1	1.3	6.4	17.5	16.7	33.5
	1948						1.2	4.7	8.1	2.3	12.1	1.3	5.7	13.1	4.6	19.3	1.3	5.9	16.9	17.0	32.9
	1949	2.8	7.2	11.2	1.1	15.4	1.3	4.4	8.2	2.5	12.2	1.8	5.1	13.0	4.9	19.2	1.8	5.0	16.1	17.5	32.1
	1950	4.3	6.3	11.7	1.4	15.7	1.7	3.9	8.3	2.7	12.2	2.5	4.3	13.0	5.2	19.0	2.4	4.2	15.6	17.1	30.9
	1951	6.2	5.4	12.2	1.9	16.2	2.2	3.4	8.3	2.9	12.1	3.3	3.6	13.0	5.5	18.9	3.2	3.3	15.2	17.4	30.3
	1952	8.4	4.5	12.6	2.0	16.2	2.9	2.8	8.4	3.2	12.2	4.1	2.9	12.7	5.9	18.6	4.0	2.5	14.7	17.0	29.1
	1953	10.8	3.6	12.9	2.3	16.4	3.7	2.2	8.5	3.4	12.2	4.9	2.2	12.5	6.2	18.3	4.7	1.9	14.2	17.0	28.3
	1954	13.2	2.8	13.2	2.8	16.7	4.4	1.7	[illegible].6	3.6	12.2	[illegible]6	1.6	12.2	6.5	18.0		1.5	13.6	16.6	27.2
	1955	13.4	2.2	13.4	3.2	16.9	5.0	1.3	8.6	3.9	12.2	[illegible].1	1.2	12.0	6.8	17.9		1.3	12.9	16.3	26.2