BRITISH GUIANA

ANNUAL REPORT
OF THE
DIRECTOR OF AGRICULTURE
FOR THE YEAR
1958

C O N T E N T S

PREFACE

General Statement Of Agricultural Polic For Brit Guiana 1958

The Policy of the Department of Agriculture is:-

Firstly — To expand exports of existing agricultural export crops, within the limitations of external trade and price agreements and market possibilities, for example, Sugar, Rice and Coffee;

Secondly - To search for and produce new crops and livestock products for export, for example, Cacao, Pork and Beef;

Thirdly — To produce, up to the level of total domestic consumption requirements, those agricultural and livestock products which can be grown locally, but which are being imported at present. Ultimately, it might be possible to expor some of them, having regard to future pat erns of external trade and local agricultur l efficiency. Examples are Coconuts, D iry Products, Poultry, Fish, Pulses, Citrus Condiments and Vegetables; and

Fourthly - To encourage, for re sons of self-suffi ciency, local production of foods which do not normally enter, to any large extent, into international trade, for example, Ground Provisions.

The Methods employed to achieve these objectives are:-

(1) Making available for productive use, after comprehensive soil surveys, increasing areas of land from the large undeveloped land resources of the country;

(2) Undertaking research to improve the productivity of existing crops and livestock and to discover new crops, new varieties and strains of existing crops and new breeds of livestock adaptable to the territory;

(3) Providing educational and Extension facilities for all members of the farm family to enable the farmer and his family to avail themselves of research findings and to secure the adoption of improved techniques and practices on the farm and in the home;

(4) Organising and rationalising economic production, marketing and processing so as to ensure that the farmer obtains the maximum return for his labour, skill and capital;

(5) Providing a climate for agricultural prosperity by introducing appropriate legislation and administrative measures and by providing necessary amenities, services and materials for efficient production, marketing and processing;

(6) Collaborating with all agencies and interests concerned with the development of the agricultural resources of the country.

SECTION I

AGRICULTURE IN THE COLONY

WEATHER CONDITIONS

The total rainfall for the year at the Georgetown Meteorological Station was 61.83 inches which was well below the average of 92.89 for the past 78 years. The exceptional features were the low rainfall in January, July, November and December and the high rainfall in April. The mean rainfall on the coastal area of the three counties was as follows:-

Berbice	69.03 inches
Demerara	65.65 "
Essequibo	62.66

2. The main effects of this abnormal rainfall pattern on Agricultural production on the coast was to bring about an increased production of rice and sugar. Although the autumn harvested rice crop was jeopardised in July by the early cessation of the rains, supplementary irrigation organised by Government reduced losses to small proportions. The dry weather of September, October and November made rice harvesting conditions ideal. However, the poor "Christmas" rains of November and December will have an adverse effect on the spring harvested rice crop of 1959. Absence of waterlogging was the main factor bringing about increased sugar yields.

3. Rainfall in riverain districts was characterised by low rainfall in November and December, but the rainfall of the North West District was about normal. Apart from limited areas of rice planted for a spring crop, production of perennial crops and ground provisions were not adversely affected in these areas. On the Rupununi savannahs of the interior which are devoted to ranching there was practically no rainfall after August and water supplies were difficult in many areas by the end of year. Grazing was getting short near to watering points.

CROPS

SUGAR

Organisation of the Industry

4. Two large companies operating twelve sugar factories ranging from 10,000 to 40,000 tons capacity per annum (total capacity over 300,000 tons), have estates in the Berbice and East and West Demerara districts ranging in size from 934 acres to 13,000 acres. Cane farmers grow a limited quantity of cane for the factories only.

Output

5. 303,361 tons of sugar were produced. 300,419 tons originating from estates and 5,942 tons from cane farmers. This was a record for the industry, exceeding the 1957 production by 21,418 tons. 86,988 acres of sugar cane were reaped, of which 84,443 acres were reaped by estates and the remainder by cane farmers. The average yield, in tons commercial sugar per acre, was 3.52 as compared with 3.42 tons in 1957. Estate production was equal to 3.7 tons of sugar per acre made from an acreage of 42.3 tons of cane per acre.

TABLE I

Sugar And Rum Statistics, British Guiana, 1957 - 1958.

Year	Area reaped (including farmers' canes) - English acres			Sugar produced (including farmers' canes) - tons			Yield per acre - tons			Rum Produced Proof Gallons.		
	Berbice	Demerara	Colony	Berbice	Demerara	Colony	Berbice	Demerara	Colony	Berbice	Demerara	Colony
1957	33,469	49,963	83,432	120,936	164,037	284,973	3.61	3.28	3.42	1,215,990	2,284,814	3,500,804
1958	35,746	51,242	86,988	124,335	182,026	306,361	3.48	3.55	3.52	1,003,956	2,434,238	3,438,194

6. Table I gives details of production for the year. The spring crop of sugar cane was of rather poor quality with high tonnages required to make a ton of sugar. This was also the case at the start of the autumn crop but there was steady improvement thereafter. Light but well distributed rainfall brought about better than average yields of cane and the dry spells promoted ripening. This counteracted the juice of poor recoverable sugar content in the latter part of the year.

Varieties

7. B41227 and B37161 continued to be the main commercial varieties with no other varieties showing signs of rivalling them. The acreage of variety B47258 is being extended and D141/46 is also recommended for extension. The varieties B4362 and Pindar are planted on a small scale.

8. The following Table shows the distribution of varieties grown on sugar plantations and reaped in 1958:-

TABLE II

Variety	Percentage distribution in the Colony	
	1957	1958
B37161	43.1	42.8
B41227	32.0	33.6
B47258	2.6	5.6
B47225	5.0	4.9
B4098	5.4	3.4
B4362	4.2	2.6
Pindar	2.3	2.5
Co 419	.9	.7
B46378	.6	.6
B47379	.5	.5
B4373	.3	.2
D62/43		.2
D37/45	.4	.1
B34104	.4	
Other varieties	2.3	
Total	100.0	100.0

Pests and Diseases

9. Leaf Scald disease continued to be controlled by the use of resistant varieties. Chlorotic streak also occurs. Froghopper was not prevalent during the year. The Yellow Aphid was prevalent on the new variety B47258.

Fertilisers

10. The quantities of, and the expenditure on, the various fertilisers used on Sugar Estates for the years 1956, 1957 and 1958 are presented in Table III. Total expenditure for 1958 was over $3,400,000.

11. The main fertiliser used is Sulphate of Ammonia but increasing attention has been given to the application of phosphate and potash fertilisers in recent years although phosphate application in 1958 was rather less than in the previous two years. Urea is applied by aerial spraying.

12. The relatively high cost of limestone keeps the application of this fertiliser at minimum levels considering the high acidity of most of the soils on which sugar

TABLE III

Value And Quantities Of Fertilisers Used On Sugar Estates
1956 - 1958

	AMMONIUM SULPHATE			SUPERPHOSPHATE			HYPERPHOSPHATE			MURIATE OF POTASH		
	1956	1957	1958	1956	1957	1958	1956	1957	1958	1956	1957	1958
Quantity - tons	14,708	19,458	19,459	3,058	2,738	1,685	1,504	3,700	1,668	1,149	1,930	2,838
Value - $	1,871,436	2,196,724	1,962,753	519,603	448,709	274,123	138,492	321,835	128,800	134,412	215,209	297,858
Cost per ton - $	127.24	112.90	100.87	169.90	163.88	162.88	92.08	86.98	77.22	116.94	111.51	104.95
% of total quantity	45.6	48.5	50.0	9.5	6.8	4.3	4.7	9.2	4.3	3.6	4.8	7.3
% of total value	62.0	56.4	57.4	17.2	11.5	8.0	4.6	8.3	3.8	4.5	5.5	8.7

	LIMESTONE			UREA			DI-AMMONIUM PHOSPHATE			MIXED		
Quantity - tons	11,492	11,700	11,369	153	488	1,004	-	110	858	-	-	19
Value - $	292,157	295,607	281,197	40,017	114,582	236,542	-	301,763	234,749	-	-	2,121
Cost per ton - $	25.42	25.27	24.73	261.79	234.80	235.60	-	274.33	273.60	-	-	111.63
% of total quantity	35.6	29.2	29.2	0.5	1.2	2.6	-	0.3	2.2	-	-	0.1
% of total value	9.7	7.6	8.2	1.3	2.9	6.9	-	7.8	6.9	-	-	0.1

TABLE IV

Exports Of Sugar And By-Products, British Guiana 1957 - 1958

YEAR	SUGAR			RUM			MOLASSES		
	Tons	Value	Value per ton f.o.b	Proof Gallons	Value	Value per gallon f.o.b	Gallons	Value	Value per gallon f.o.b
1957	255,536	$53,595,028 £11,165,638	$209.74 £43.69	2,815,614	$4,007.863 £834,971.4	$1.42 £ .30	9,233,576	$2,169,391 £451,195.6	$0.23 £0.05
1958	300,314	$54,726,607 £11,401,376	$182.23 £37.19/3½	2,454,591	$3,451,852 £719,135.16/8	$1.41 £0.29	12,531,128	$2,549,486 £531,142.18/4	$0.20 £0.04

cane is grown.

Marketing

13. Total exports of sugar amounted to 300,314 tons as compared with 255,536 tons in 1957. The average export price was $182.23 per ton as compared with $209.74 per ton for 1957. The export of rum was 245,459 proof gallons valued at $3,451,852. Local sales amounted to 500,719 proof gallons. The export of molasses was 12,531,128 gallons valued at $2,549,486 as compared with 9,233,576 gallons valued at $2,169,391 in 1957.

14. Exports of sugar to the United Kingdom under the Commonwealth Sugar Agreement were 154,567 tons at $210.40 per ton c.i.f. Local sales of sugar were 18,415 tons as compared with 18,612 tons in 1957. Local sales of rum were 500,719 proof gallons, a reduction of 23,800 gallons.

15. Table IV summarises the export trade in Sugar, Rum and Molasses.

RICE

Organisation of the Industry

16. Rice is grown chiefly on the heavy clay soils of the coastal belt and is principally a peasant crop, cultivated mainly by farmers whose individual holdings cover an average of about 7 acres though some cultivate as much as 400 acres by mechanical methods. The British Guiana Rice Development Company under Government sponsorship cultivated approximately 2,600 acres.

Output

17. There was an increase in acreage and production was the highest on record. The total area cultivated for the autumn crop was 155,140 acres producing 91,000 tons of rice. Including the spring crop the total rice area reaped was around 183,326 acres compared with 152,500 in 1957 producing an estimated 100,519 tons of rice as compared with 57,500 tons. Weather conditions were most favourable for the crop apart from the early cessation of rains in July which caused some setbacks. Harvesting conditions were ideal and quality of padi was generally good.

18. Table V summarises the production of Rice.

TABLE V

Rice Acreages And Yields
British Guiana - 1957/1958.

Year	Total Estimated Acres (Spring & Autumn Crops)				Estimated Yield Tons of Rice
	Berbice	Demerara	Essequib	Total	
1957	67,800	58,300	26,400	[illegible]	57,500
1958	78,807	78,872	31,647	183,326	100,519

Marketing

19. The British Guiana Rice Marketing Board continued to be responsible for the internal and export marketing of the entire production of rice.

20 During the financial year, 1st October, 1957 to 30th

September, 1958, millers delivered to the Board 644,199 bags of rice (180 lbs. gross weight), equivalent to 51,766 tons. This represents a reduction of 7,907 tons delivered to the Board during the previous financial year and is an indication of the poor crop of 1957.

21. Exports in 1958 fell to 17,651 tons valued at $4,778,922 compared with 38,163 tons valued at $9,166,610 in the previous year. The average price received rose to $270.74 per ton, an increase of $30.54 over that for 1957. Local sales and retentions by growers amounted to 29,599 tons.

Prices

22. The price structure for padi and rice was as follows:-

PADI ... $6.80 per bag of 140 lbs. nett for dry, clean and well-winnowed padi;

RICE ...

Grade	Price per bag of 180 lbs. $
Extra Super ---	20.70
Super	19.70
Extra No. 1	18.55
No. 1 ---	17.60
Extra No. 2 ---	16.45
No. 2 ---	15.35
No. 3	13.20
Super Broken	9.85
Broken	8.20
Unclassified --	7.00
White A --	19.70
White B --	15.35
White broken	10.00

23. The selling prices of rice for export to the British West Indies having contracts with the Board were as follows:-

Grade	Price per bag of 180 lbs.
Super ---	21.30
First Quality	19.20
Second Quality	16.95

24. Local selling prices were s follows:-

Super	$22.15	per of 180 lbs.
Brown A	18.80	" " "
Brown B ---	14.45	" "
White A ---	21.30	" " "
White B	16.95	" " " "
Brewers' Broken	12.00	" " " "
Mixed broken	10.45	" " " "
Stock feed	7.20	" " " "
"Pearl Brand"	10.00	per 50 lb. carton
"Indian Brand"	7.73	per 50 lb. sack

Milling

25. In addition to the two large rice mills of the British Guiana Rice Development Company at the Mahaicony/Abary Rice Scheme (capacity 18,000 tons of rice), and at Anna Regina (capacity 12.6 thousand tons of rice), there are 216 other privately owned mills of comparatively small output. The large majority of small mills are of the single stage huller type which cannot separate bran for

stock feed and are not as efficient as multi-stage mills. The future of the milling industry must move towards multi-stage mills and already a small number with capacity as small as half-ton per hour have been installed. The report of Sir Archibald Cuke recommending a Scheme for the Compensation of Millers who voluntarily agreed to close their mills at the request of the Rice Development Company was received, but no satisfactory solution was agreed between the Company and the Rice Millers Association. The Central mills of the British Guiana Rice Development Company purchased a total of 479,530 bags of padi during the year of which 30,702 bags were from the Company's cultivation.

Machinery

26. Mechanisation of the Industry continued to expand and the bumper autumn crop enabled farmers to pay off their loans for the purchase of tractors. A total of 421 tractors valued at $2,060,143 were sold to the rice industry during the year and 11 combine harvesters valued at $168,225. This compared with 344 tractors (valued $1,181,636) and 31 combines (valued $230,055) in 1957. The smaller powered tractor pulling mould-board ploughs and disc harrows is the commonest form of mechanised cultivation. The tractors are also used for threshing by running over the cut straw. A variety of combine harvesters are in use ranging up to the large 14 ft. self-propelled machines on tracks. The problems of mechanisation of the industry are now recognised and it is clear that controllable irrigation and drainage goes hand in hand with efficient mechanisation. The probability of getting wet weather at the time of cultivation is great in the local climate, and under-water cultivation has been developed.

27. Mechanisation of the rice industry is assisted by the continued issue of duty free gasolene for cultivation and harvesting. A total of 513,940 gallons were issued. Hire service of various types of machinery was continued by the Rice Producers' Association, the Government's Machinery Pool and private operators. Pumping of irrigation water was necessary in certain areas to save the autumn crop and a Central Drought Committee and District Committees were set up to coordinate efforts in this field.

Pests and Diseases

28. There were serious outbreaks of Blast disease (Piricularia oryzae) on the East Bank Demerara (500 acres) and on the East Bank Berbice (400 acres). It is estimated that production was reduced by 50% to 70% in these areas. Although the disease was found on the main coastal rice area, it was not serious. Measures were taken to prevent the movement of the infected rice from the diseased areas. Experimental work was begun from the spring crop involving the use of a range of fungicides, and to test the role of fertilisers and determine the resistance of varieties bred locally.

29. There were outbreaks of the Padi Bug (Mormidia poecila) on the islands of Leguan and Wakenaam and on the Corentyne. Dusting with B.H.C. was carried out. A plan was worked out for the Rice Producers' Association to obtain dusting equipment and insecticidal dusts to be used on the advice of the Agricultural Department when outbreaks of padi bug occur.

30. The Water Weevil (Lissorhoptrus) was of widespread occurrence but was only damaging where proper water movement could not be achieved.

Supply of Pure Line Seed

31. Pure line seed padi was produced at the Anna Regina and Cane Grove Land Settlements under the supervision of the Department of Agriculture, and also on a very limited scale by private farmers. A total of 7,654 bags (140 lb. nett) of Pure Line Seed and 9,432 bags of commercial grade (unrogued) seed was sent out for sale in the districts. The main varieties in use were No. 79 and D 110. Small quantities of 85/42 and 52/37 were also produced. Growers were paid $8.55 per bag which was sold at $9.55. The quantity of accredited seed being used by the industry can only plant about 15% of the acreage planted and plans are being made to encourage the use of better seed. The sale of seed through Co-operative Societies in 1958 was helpful.

Fertilisers

32. The use of fertilisers by the industry is still small but there are indications that a 10:20 N.P. mixture is finding favour particularly in toxic soil areas where responses are large. Fertiliser demonstrations were made on a Colony wide basis on some 80 farms. It is difficult to make exact recommendations in many areas where the results of fertiliser experiments are indefinite and fertiliser application is doubtfully economic with existing varieties and water control conditions.

General

33. A Rice Committee was set up under the Chairmanship of His Excellency the Governor to attempt to co-ordinate the efforts of the leaders of the Rice Industry with those of Ministers and Government Officials who were closely concerned with the industry, with the object of working out a practical policy to which all would agree for increasing the future efficiency of the industry. Many aspects, including planting time, fertilising, mechanisation, drying, storage, milling, grading, land-rent, credit and legislation were considered.

COCONUTS

Organisation of the Industry

34. Coconuts are the third most important crop in the Colony with an estimated 32,000 acres grown on estates and in scattered plantings along trenches and roadways. The industry does not meet the demand for edible oil, however, and steps were taken to encourage increased planting. The dry conditions were not favourable for the crop.

Output

35. There was a decrease in copra production only 4,832 tons being produced compared with 5,370 tons in 1957. Conditions of drought during the year were favourable to the production of copra by sun drying.

36. Table VI shows the production of various coconut products in 1958 compared with 1956 and 1957.

TABLE VI

Year	Copra (tons)	Copra Meal (lbs.)	Edible Oil (Glns.)	Crude Oil (Glns.)	Soap (lb.)	Margarine & compound lard (lb.)
1956	5,468	3,901,694	696,440	230,567	4,454,762	636,818
1957	5,370	3,814,412	676,731	147,339	4,777,727	1,642,230
1958	4,832	3,432,358	623,835	109,729	4,012,976	1,920,978

Grading

37. Copra grading continued. Prices paid were:-

Grade I	$282.80 per ton
Grade II	271.60 " "
Grade III	260.40 " ".

38. The Coconut Moth borer (Castnia daedalus) continued to be an insidious pest in the Mahaica/Mahaicony and other areas. Improved cultural practices and the spraying of affected palms with a 1% Dieldrin controlled the pest to some extent.

General

39. The Industrial Development Advisory Committee made a number of recommendations for improving the industry. These were receiving the attention of Government at year end. The Colony continued to participate with the West Indies in the Oils and Fats Agreement.

COFFEE

40. Stable prices for coffee were maintained during 1958. Production in the North West District increased, but adverse weather conditions affected the Pomeroon production. Exports totalled 417,088 lbs. valued at $273,464.

41. Sclerotium disease was present, but not as pronounced as in wetter years.

CITRUS

42. Over 12,000 budded citrus plants were distributed by the Department of Agriculture during the year. Considerable new planting took place, and could have been increased still more had the dry weather at year end not curtailed farmers' activities. Marketing was somewhat disorganised in the early part of the year on account of importations at unusually low prices from Suriname and Trinidad. New interest was awakened in the cultivation of limes, particularly in the North West District and the Berbice River Bank.

43. Exports of lime oil and lime juice are shown in Table VII below:-

TABLE VII

Year	LIME JUICE		LIME OIL	
	Quantity Glns.	Value $	Quantity Lbs.	Value $
1957	17,191	20,017	300	3,142
1958	10,781	15,314	1,395	19,422

FOOD CROPS

Roots & Plantains

44. Record crops of ground provisions were produced during the year. The dry weather of the past two years was favourable for the clearing and burning of new land, and farmers were quick to take advantage of the situation. Plantains and cassava dominated production and glutted the market, the situation being relieved by extended local distribution and direct export shipment from the producing

centres to Trinidad. Purchases by the Marketing Division increased from 491,102 lbs. in 1957 to 10,946,531 lbs. in 1958. Exports of plantains were 808,765 lbs. compared with 2,667 lbs. in 1957. 202,713 lbs. of starch was manufactured from surplus cassava and exported. There was no export in 1957.

Corn

45. Corn production was at a level to meet local demand and supply a surplus for export of 540,736 lbs. valued at $43,240 compared with 108,660 lbs. in 1957.

Cacao

46. This long established crop which had been practically abandoned on account of low prices and disease is being revived. It is the most suitable crop for the riverain lands and the policy is to encourage the planting of high yielding clones, the plants of which can be obtained from Government nurseries. One large commercial firm intends to plant an initial 1,000 acres in various areas. The crop is only taking on slowly by smaller growers as the crop does not give a return for four years and credit or initial capital is needed.

ANIMAL HEALTH

Paralytic Rabies

47. Outbreaks of this disease occurred in the West Coast Demerara, and Essequibo and during the innoculation programme 25,000 animals were treated.

48. There were only a few cases of the disease reported from the Rupununi area where there was an innoculation programme in 1957. The cases occurring were uninnoculated calves.

Equine Encephalomyelitis

49. An outbreak occurred on the Corentyne coast but systematic innoculation of horses, mules and donkeys and prevention of movement of animals outside the area avoided further spread.

Poultry Disease

50. Preventive innoculations gainst Newcastle Disease and Fowl Pox were continued. O er diseases occurring are Salmonellosis, Coccidiosis, H stomoniasis and Leucosis complex.

General

51. Inspection of Livestock ntering the Colony continued as a means of preventing t e introduction of diseases.

DAIRY INDUSTRY

52. The Government Milk Pasteurisation Plant operated throughout the year and purchased 479,446 gallons valued $358,385.99 which was an increase of 211,938 gallons over 1957 purchases. There is every indication that the increase will continue in 1959. There are no figures of the total colony production of milk, as milk sold in New Amsterdam and the country districts does not pass through the Pasteurisation Plant, but it is estimated roughly

at 1,250,000 gallons per year. This quantity of milk does not nearly meet the national consumption, however, and reference to Table VIII shows the large imports of dairy products, that are regularly imported and are equivalent to some 6,000,000 gallons of milk.

TABLE VIII

Imports Of Milk Products

Product	1957		1958	
	Import lbs.	Value $	Import lbs.	Value $
Condensed milk (sweetened)	3,819,691	1,099,988	4,218,322	1,150,903
Evaporated milk	5,569,403	1,432,944	6,129,289	1,425,875
Milk powder	1,249,545	881,179	1,483,794	923,554
Total	10,638,639	3,414,111	11,831,405	3,500,332

53. Despite the complete inadequacy of the fresh milk supply to meet the milk consumption of the population it has only been possible to maintain sales from the Milk Pasteurisation Plant at an average of 1,100 gallons per day because of the preference for canned, sweetened and powdered milks. The total of surplus unsold milk was 77,422 gallons valued at $61,042.37 which was distributed free of charge to Government Institutions, charitable organisations, etc. 25,548 gallons were also sold at half-price to Schools. $74,838.29 of the nett loss of $163,161 incurred in running the Pasteurisation Plant is accounted for in free distribution and School milk.

54. The Dairy Industry is clearly at the cross roads for production is on the increase as a result of the Artificial Insemination Services, improved management and feeding while consumption is increasing only slowly. The protection of the industry from the low cost dairy products obtainable from other countries is being considered as well as the need for a local condensary.

55. The Milk Pasteurisation Plant purchases milk from the farmer at the following prices:-

	Price per gallon
Leguan and West Coast Demerara	$ .72
Cane Grove	.86
West Coast Berbice) East Coast Demerara)	.70
Georgetown (Delivered)	.80
Grade A - t.b. tested - (Delivered) Georgetown	.96

56. Milk is sold at $1.08 per gallon wholesale and the retail price is 16¢ per pint.

57. The dairy cow on which the industry is being built is a cross between the unimproved animal and the Friesian Holstein breed. Where possible the Zebu animal is brought in to give heat tolerance. The most suitable crosses for local conditions are between 50% and 75% of Friesian blood. The higher grade animals need very careful management. The Artificial Insemination Service recorded 2,999 services on this programme during the year as compared with 2,275 in 1957.

58. The Dairy pansion Scheme was expanded during the year. A total of 70 cows and heifers are now being used on the Scheme. A deserving farmer who undertakes to discharge certain technical requirements is given a heifer in-calf to a dairy bull. The farmer is required to return the first heifer calf to the Scheme for raising and breeding until it is ready for issue to another farmer. Proper breeding and feeding under this Scheme will give the farmer much improved animals.

Beef

59. The major centres of specialised beef production are the coastal ranches mainly limited liability companies and the Rupununi Savannahs. A limited supply comes from the Intermediate savannahs, where cattle rearing is made possible by the feeding of mineral supplements. Oxen and old cows produced by small farmers augment the supply.

60. The most recent estimate of cattle population is 8,000 animals on the coastal ranches and 47,000 in the Interior Savannahs of the Rupununi. There were probably small increases since this estimate was made.

61. All cattle on the coast are delivered on the hoof to the abattoirs while the animals from the Rupununi savannahs are either sent to the market on the coast over the cattle trail or slaughtered at the Lethem Abattoir and the carcases transported by aircraft to Georgetown.

62. The failure of the rains at the end of the year caused grazing to be sparse on the coastal ranches and communal pastures. The Rupununi was also short of water and production is likely to be adversely affected.

63. A total of approximately 18,000 head were slaughtered in the Colony during the year of which 6,753 head were in Georgetown.

64. Cattle and beef exports totalled 477 head exported to Suriname and 46,799 lbs. by aircraft to Guadeloupe valued at $120,682.

Hides

65. The weight of hides exported was 399,651 lbs. valued at $32,005 an increase of 484 lbs. over 1957.

Pigs

66. The number of pigs slaughtered for the year was 13,500. A total of 9,679 lbs. of pork and 28 head were exported valued at $6,970. The pig industry declined during the year mainly because of the poor supply of copra meal and low grade rice. It will be necessary to adopt measures which will encourage farmers to produce more pigs.

Sheep & Goats

67. Slaughterings of sheep and goats totalled approximately 1,100 but there are numerous private slaughterings in rural areas. The majority of sheep and goats for mutton graze untended on pastures, roadsides, etc. Milch goats are reared on a limited scale and a small herd of British Alpines is maintained by the Government Stock Farm.

Poultry

68. The Broiler Industry continues to expand and it is estimated that 600,000 lbs. of this type of poultry was

produced during the year. The industry was satisfying fully the local demand at the end of the year and will be protected by the control of imports so long as this situation continues. The production of broilers is in the hands of a small number of operators who have formed themselves into a Broiler Council and are marketing the dressed and packaged birds at 96¢ per lb. retail. The industry depends almost entirely on imported feeds. There is a regular sale of live birds in the markets including fowls, ducks and turkeys.

69. Imports of dressed poultry totalled 147,033 lbs. valued at $110,049 as compared with 119,281 lbs. valued at $84,687 in 1957.

70. Egg production is unorganised and does not meet the demand. Imports of eggs totalled 218,800 valued at $18,857.

Imports of Meat Products

71. The quantity of meat imports including fresh, chilled, frozen, salted, smoked and meat preparations was 3,329,275 lbs. valued at $1,824,785. This compared with 3,011,976 lbs. valued at $1,532,017 in the previous year.

BEEKEEPING

72. The dry year was again favourable for beekeepers and during the dry months the blooming of honey producing trees was profuse. Beekeepers had no difficulty in maintaining production and the average output per colony was 60 lbs. The total number of beekeepers was 336 the majority operating one or two hives. A few beekeepers operate well over 100 colonies.

73. The estimated production of honey was 104,000 lbs. of honey an increase of 15,600 lbs. over the previous year. Production of beeswax was estimated at 2,080 lbs. and the value of both products at $30,000. The local market for honey was kept supplied throughout the year and there was also a ready market for beeswax. There was no export.

FISHERIES

Marine

74. Fishing on the broad shallow mud flats and further seawards provide the majority of fresh fish for local consumption. The principal method employed is the "Pin" seine and to a lesser extent cadell and handlines. Chinese seines are used in the estuaries of the rivers. The principal types of fish caught inshore are Queriman, Catfish, Snook, Bangamaree, Bashaw, Crabs, etc.

75. Deep sea fishing was carried on by twelve schooners using hand lines to capture snapper and grouper and by six trawlers in addition to the government operated research vessel "Cape St. Mary". Two of the trawlers were commissioned during the year while the others were operated by the British Guiana Fisheries and Trading Company which came to British Guiana originally in search of Shrimp. Successful catches of sea-trout, golden croaker, and bangamaree have resulted from the trawling operations in depths between 15 and 25 fathoms and in rather deeper water in the north west.

76. The Snapper fishing operations in deeper water 60 miles to 100 miles offshore received the assistance of Mr. Francis Taylor, an International Co-operation

Administration Specialist, of the United States of America, Mr. Taylor demonstrated the use of fishing reels and taught fishermen more efficient methods of line fishing.

77. Financial assistance continued to be provided to fishermen by way of refunds of duty on all fishing gear, gasolene, lubricating oil, dieseline and net preservation. Duty refunds totalled $36,803 in 1958.

Inland

78. The principal fishing areas are inland waterways, reservoirs, swamps, fish ponds and fields under flood fallow. Cast nets, gill nets, fence stop-offs and seines are the main methods of capture and pots and traps have been introduced with some success. Any estimate of production and other statistics are lacking as most of the fish is caught for home consumption by part-time fishermen. The majority of fishermen do their fishing from the land but boats are used on the rivers and there are 32 registered fishermen with out-board engines.

Fish Culture

79. The programme for the culture of the exotic fish (Tilapia mossambica) in ponds, met with some response, but dry weather resulted in the drying up of many ponds. The young fry were distributed from the Department's Nursery Ponds. Fish culture experiments in the brackish water ponds at Onverwagt show some possibilities.

Production

80. The fish handled by the Municipal markets amounted to 6,657,555 lbs. as compared with 6,357,765 lbs. in 1957. The Government Fish Market handled 945,920 lbs. of fish which was distributed to Municipal markets, Government Institutions, Rural and Riverain areas and the Interior.

81. Trawling operations resulted in the production of some 900,000 lbs. of fish of which 356,340 lbs. were landed by the Government Trawler "Cape St. Mary".

Imports

82. 5,933,422 lbs. of fish and fish preparations valued at $1,984,496 were imported.

Value of Agricultural Exports

83. Table IX summarises the quantity and value of Agricultural exports in 1958.

SECTION II

DEPARTMENT OF AGRICULTURE

84. The Department is administered by a Director, Deputy Director and three Assistant Directors. The latter supervise three main divisions - Research, Extension and Veterinary Services & Animal Husbandry. A Marketing Division comprising Produce Depots, Wholesale Fish Market, Bacon & Ham Factory, Milk Pasteurisation Plant and a Processing Factory come under a General Manager with control direct from the Director and Deputy Director. The Department reverted from two Deputy Directors to one during the year.

85. Table X gives the Organisational Chart of the Department.

TABLE IX

Value Of Agricultural Exports

Commodity	Quantity	Value	Percentage
SUGAR & BY-PRODUCTS			
Sugar	300,314 tons	54,726,607)	91.62
Molasses	2,454,591 gallons 12,531,128 "	3,451,852) 2,549,486)	
RICE	17,651 tons	4,778,922	7.21
LIMES			
Juice	10,781 gallons	15,314)	0.05
Oil	1,395 lbs.	19,422)	
FOOD CROPS			
Plantains	808,765 lbs.	35,480	0.05
Cassava starch	202,713 lbs.	100,818	0.15
CORN	540,736 lbs.	43,240	0.07
COFFEE	117,088 lbs.	273,464	0.41
BEEF	477 head & 46,799 lbs.	120,682	0.18
PORK	28 " & 9,679 lbs.	6,970	0.01
HIDES	399,651 lbs.	32,005	0.05
VEGETABLES (Fresh)	181,227 lbs.	12,782	0.02
FEEDING STUFF FOR ANIMALS (Mainly Rice Bran)	3,566,780 lbs.	117,760	0.18
Total		66,284,804	100.00

86. The Department provides technical assistance to Land Settlement Schemes. The Director of Land Settlement is advised on agricultural policy together with recommendations for cropping. Services for guiding and instructing tenants are provided.

87. The Permanent Establishment of the Department comprises 49 Senior Administrative and Professional, 67 Junior Technical Personnel and 30 Clerical Officers. Provision is made for 13 Senior Professional, 10 Junior Technical and 2 Clerical posts on the Development Programme. There are also a large number of temporary staff and labourers.

88. The amount voted by the Legislature for the Recurrent Services of the Department including Miscellaneous Services was $1,295,990 and $1,053,656 was provided for Development Schemes and Services.

RESEARCH & EXPERIMENTATION

Organisation of the Research Service

89. The Research Branch of the Department of Agriculture consists of the Assistant Director (Research) who coordinates the work of a team of specialist officers consisting of an Economic Botanist, two Entomologists, a Plant Pathologist, three Agricultural Chemists, one Soil Scientist, two Soil Surveyors and two Agricultural Officers who deal with perennial and annual crops. With the exception of the Chemistry Division, all other specialists, have temporary laboratories at the Central Agricultural Station and, in addition, are provided with quarters so as to be within easy access to their laboratories and field experiments.

90. In addition to the Central Agricultural Station which serves as the main centre of research there are four other research stations of the Department. The North West District Station, Hosororo, deals with the main crops of the area such as Citrus, Cacao, Coffee and Root crops generally and in addition with the fertility problems of the deep pegasse soils. The Ebini Livestock Station on the right bank of the Berbice River and about seventy miles inland is situated on poor sandy soils. This station is investigating the possibilities and economics of beef production under the conditions of low soil fertility. The St. Ignatius Livestock Station in the interior Rupununi Savannahs is also engaged with the problems of livestock production, animal health, pastures and breeding for the beef trade in the area. The Cacao Research Station at Atkinson on the right bank of the Demerara River and about 25 miles from Georgetown deals primarily with the introduction and trial of cacao clones in addition to plant propagation.

91. There is a Central Research Committee with the Director of Agriculture as Chairman, the Deputy, three Assistant Directors and the Sugar Agronomist as members. This Committee approves the general programme of Research to be pursued in the Department in relation to the policy of Government. In addition, there is the Rice Research Committee with the Assistant Director (Research) as Chairman, and other specialist officers as members. This Committee discusses the technical problems of the rice industry and submits programmes of investigations to the Central Research Committee for approval. There is also the Sugar Research Committee consisting of the Director of Agriculture as Chairman and research officers of the Department review the progress on sugar research undertaken by Company, Sugar Producers Association and Departmental Organisations.

TABLE X

ORGANISATIONAL CHART

DEPARTMENT OF AGRICULTURE BRITISH GUIANA

DIRECTOR

DEPUTY DIRECTOR

CLERICAL STAFF - Executive Officer
Accountant
Central Accounting Staff
District Accounting Staff

BOTANICAL GARDENS

ECONOMICS DIVISION (SECTION (a) Production; SECTION (b) Marketing

MARKETING DIVISION (Fish Market; Processing Factory; Bacon and Ham Factory; Produce Depots; Pasteurisation Plant)/

ANIMAL & PLANT PROTECTION SERVICE

AGRICULTURAL OFFICER (Land Settlement & Development)

EBINI LIVESTOCK STATION//

ST. IGNATIUS LIVESTOCK STATION//

FISHERIES DIVISION (Marine, Inland & Research)

AGRICULTURAL OFFICER
FARM YOUTH TRAINING
INFORMATION & EDUCATION
LIBRARY & PUBLICATIONS

ASSISTANT DIRECTOR (Extension)
DISTRICT STAFF AGRIC. ENGINEER
AGRICULTURAL OFFICERS (11)
AGRICULTURAL ASSISTANTS (5)
FIELD ASSISTANTS (39)
(District Demonstration Stations & Nurseries)

ASSISTANT DIRECTOR (Research)
A.O. (Perennial Crops)
A.O. (Annual Crops)
A.O. (Rice)
A.O. (Fibre & Pasture)
Plant Pathologist
Entomologist
Entomologist (Rice Storage Investigations)
Agricultural Chemists (3)
Soil Surveyors (2)
Soil Scientist (1)
Agronomists (Soil Surveys)(2)
CENTRAL AGRICULTURAL STATION/

ASSISTANT DIRECTOR (Veterinary & Animal Husbandry)
Veterinary Officer (Research)(1)
Veterinary Officers (General)(4)
Livestock Officer

N.B:- / Advisory Marketing Committee with D. of A. as Chairman
// There is an Administrative Committee comprising D.D. of A. Chairman, A.D. (V) & A.D. (R)
/ There are a Central Research Committee with D. of A. as Chairman, A Rice Research Committee and a Consultative Committee for C.A.S.

Other Research Organisations

92. The Sugar Experiment Station which is maintained by the Sugar Producers' Association serves the sugar industry and is engaged primarily in varietal and fertiliser investigations. Bookers Sugar Estates Limited maintain a well-equipped research laboratory and a team of technical staff that investigate in greater detail the problems of sugar cane cultivation on their plantations. In addition, other sugar plantations carry out limited research for their cultivation and processing of sugar.

93. The British Guiana Rive Development Company Limited continued to work on problems in connection with all aspects of the mechanisation of rice cultivation, and the Berbice Fibre Research Company Limited continued its efforts to determine whether Jute could be produced economically under local conditions.

The Finance of Research

94. The research work on sugar cane is financed by the Sugar Producers' Association which includes all sugar manufacturers in the Colony. Rice research is financed by local funds and with some assistance for fertiliser investigations from Colonial Development and Welfare grants. The Ebini and St. Ignatius Livestock Stations, Soil Surveys, Botanical Surveys and Hosororo Agricultural Station are financed by Colonial Development and Welfare grants which come to an end in 1960. All other agricultural research investigations are met by funds provided by the local Government.

SUGAR CANE

Variety Testing

95. Variety testing of seedlings continued to be the main line of investigation. A wider range of seedlings crosses are being made at the British West Indian Central Cane Breeding Station than formerly and fuzz from these crosses is germinated at the Sugar Experimental Station. In addition, first selections from Barbados are tested in British Guiana and seedlings are raised from crosses made at the Station.

96. B41227 and B37161 continue to be major commercial varieties. The acreage in B472 has, however, been extended. While this variety is he equal of the two major canes in respect to yield, it is heavily attacked by rats and in some areas also by aphids B4362 and Pindar are planted on a small scale while D 141/46 has been recommended for extension on estates. The ields and quantity of the major varieties under test relat ve to the standard variety B 41227 are set out in Table XI.

97. Routine testing of breeding canes and of promising new seedlings for resistance to leaf scald disease continued. The only practical method of control of this disease is the growing of varieties showing resistance

98. Experiments on the benefits of liming local soils are continuing. In the present series, small but statistically insignificant yield increases are general, obtained at each reaping cycle. Since one of the major benefits from liming is its effect in increasing the availability of soil phosphate and to some extent soil potash as well, leaf analyses for both of these nutrients and juice analysis for the former are being made to study these effects over several cycles. In addition, the increase in availability of natural soil phosphates from liming is being compared with the phosphate uptake from appli tions of 6 cwt. of

TABLE XI

The more Outstanding Varieties compared with B. 41227

Variety	No. of Comparisons P.	1 R.	2 R.	Available Pol. per acre Index (B. 41227 = 100) P.	1 R.	2 R.	Tons available Pol. per acre (B. 41227 = 100) P.	1 R.	2 R.	Available Pol. % Cane Index (B. 41227 = 100) Mean All Cycles.
B. 141/46	13	12	12	105	108	109	6.74	5.81	5.18	104
B. 49119	14	13	7	101	111	106	6.48	5.97	4.06	101
B. 47258	21	21	15	103	107	102	6.61	5.76	4.86	102
B. 41227*	-	-		100	100	100	6.42	5.38	4.76	100
B. 49/46	16	15	15	90	106	105	5.78	5.70	5.00	95
D. 37/45	18	18	18	93	100	101	5.97	5.38	4.81	101
B. 43413	14	14	12	96	94	100	6.16	5.06	4.76	98
B. 45137	17	17	15	92	101	95	5.91	5.43	4.52	96
B. 47419	11	10	3	94	95	97	6.03	5.11	4.62	99
B. 158/41	12	12	10	98	91	91	6.29	4.90	4.33	93
B. 37161	42	42	36	91	96	92	5.84	5.16	4.38	100
B. 4362	15	15	15	93	95	90	5.97	5.11	4.28	108
B. 46378	18	18	18	94	89	95	6.03	4.79	4.52	97
B. 47225	18	18	16	95	90	90	6.10	4.84	4.28	101
D. 53/43	6	6	6	92	91	92	5.91	4.90	4.38	92
D. 4/43	13	13	13	90	93	92	5.78	5.00	4.38	95
Pindar	22	22	14	89	90	95	5.71	4.84	4.52	102
B. 4098	17	17	15	96	88	82	6.16	4.73	3.90	101
B. 4995	10	10	10	92	88	87	5.91	4.73	4.14	101
D. 54/43	10	10	10	88	90	87	5.65	4.84	4.14	90
B. 46351	15	15	15	87	92	85	5.59	4.95	4.05	96
B. 4942	11	11	11	94	86	79	6.03	4.63	3.76	104
B. 4744	13	13	11	86	92	81	5.52	4.95	3.86	98
B. 47379	11	10	7	87	88	80	5.59	4.73	3.81	90
B. 4373	16	15	12	85	89	80	5.46	4.79	3.81	92
B. 43253	10	10	10	80	88	86	5.14	4.73	4.09	107
B. 34104	25	23	16	86	82	83	5.52	4.41	3.95	99

*Standard Cane

single calcium superphosphate per acre from:-

(a) Continued annual applications at this rate; and

(b) From a single applic tion to the plant cane crop.

99. Experiments to test the relative value of different nitrogenous and phosphatic fertilisers were continued. No significant differences were found between the various sources of nitrogen and phosphate.

100. Experiments to determine whether different cane varieties possessed different nitrogen requirements were continued.

Leaf Scald Disease

101. Research on this disease, which is a major factor in the future progress of the sugar industry continued. The Plant Pathologist of the Department continued with the routine rating of newly bred and introduced varieties at the Sugar Experiment Station. It is evident that the industry must be based on varieties which are classified as at least susceptible - tolerant to the disease. An experiment to determine the "field rating" of the promising commercial variety B49119 was carried out n comparison with the variety B34104 and other standard varie ies of known susceptibility to the disease and it was found that B49119 gave a susceptible rating.

102. Histopathological studies were commenced but too few specimens have been examined for definite conclusions to be drawn. The future work on the disease is to be concerned with the method of spread of the disease, its histopathology and other problems.

103. A serious outbreak of ye Spot (Helminthosporium sacchari) occurred at Providenc , Berbice, on the variety of sugar cane B37161. The diseas was quickly brought under control.

Insect Pests

104. Outbreaks of the yellow aphid (Sipha flava) were observed on several sugar plantations on the variety B47258. Spraying with Malathion gave effective control in some instances. Experiments have shown that the variety B47258 has much greater susceptibility to an attack of yellow aphids than the varieties Pindar, D 37/45 and B41227.

RICE

Introduction, Breeding and Genetics

105. The rice breeding programme continued at the Central Agricultural Station for the spring and autumn crops. The development of new varieties must satisfy the following conditions:-

(a) Be at least equal in yield to that of the standard variety No. 79;

(b) Be non-lodging;

(c) Be non-shattering;

(d) Have a long or medium grain shape, except if the yield is exceptional;

(e) Give a range of maturation period of up to six weeks;

(f) Show some resistance to Blast (Piricularia Oryzae Cav.) and Cochliobolus oryzae.

Further that the varieties must be tested with and without fertilisers to measure responses.

106. A large number of varieties growing in yield trials in the spring crop was found to be impure. Single head selections were made and grown as purity testing plots in the autumn crop. Only eleven varieties were sufficiently pure out of a total of nearly four hundred. It was noted that a number of the new varieties were still segregating in generations of F 11 to F 13. The pure varieties have been planted for the 1959 spring crop as maintenance plots and in yield trials. 179 foreign varieties were grown for the autumn crop as quadruplicate maintenance plots of which 31 were discarded for impurity or undesirable characters. These are also growing for the 1959 spring crop as maintenance plots and in varietal trials. About 6,000 hybrids of generations F 3 to F 13 were planted. About 2,500 selections were made on the basis of non-lodging, blast-resistant, non-shattering, satisfactory yield indication and other characteristics, and these will be planted in 1959. About 1,800 of these hybrids were of high generations (F 10 to F 13) and were tested against the local standard variety No. 79. Selections were made for quadruplicate maintenance plots and variety trials to be grown in the 1959 autumn crop.

107. Eleven pure varieties have reached the stage of final testing. Of these, the first four listed in the Table below are the most promising as regards yield, while the remaining four are "possibles". Although the first four have invariably outyielded the standard No. 79 at the Central Agricultural Station, they have not done so at the Mahaicony/Abary Rice Development Scheme. Nos. 180 and 163 have been extremely disappointing at the latter site. These varieties are being further tested for the 1959 spring crop both at the Central Agricultural Station and at the Mahaicony/Abary Rice Development Scheme; they are also being grown in farmers' trials for the 1959 spring crop at Leguan and Wakenaam. At the same time seeds are being rapidly bulked up from 100% pure stock to serve as a source of foundation seed for Pure Line Seed Padi producers.

Variety	Characteristics
C.A.S. 451	Very susceptible to Blast; cooks sticky
" 542	Attractive grain; no cooking information
" 719	Hard to thrash; no cooking information
" 867	do.
" 1071	Hard to thrash; long grain; cooks well
" 378	Cooks sticky; long grain
" 180	Very variable yield, rather late maturing
" 163	do.

108. These new varieties have given significant responses to applications of both nitrogen and phosphate at the Central Agricultural Station, but on the other hand, when they were grown at the Mahaicony/Abary Rice Development Scheme they did not show a significant response to fertilisers in spite of much lo r yields at the latter site.

109. Severe Blast attacks i the river bank areas are being studied. A total of 133 arieties (foreign, local and F7 hybrids) have been transp anted in this area for the 1959 Spring crop for observations on Blast resistance. None of these varieties had shown any symptoms of Blast in the previous crop at the Central Agricultural Station.

110. An experiment on seed dressing has shown a very marked response in germination, but no response in yield, indicating that the seed rates in common use are excessively high. The experiment is being repeated with lower seed rates for the 1959 spring crop.

111. Seeds of a variety of the Indo China Deep water paddy were sown in a dry cross c nal at the Central Agricultural Station using pregerminated seed. It was observed that even pre-germinated seed would not germinate through even the lightest film of water, so that "patching" had to be carried out in some small pools. The depth of water was increased up to a maximum of about four feet as the plants developed. The crop commenced flowering in December about seven months after seeding. The yield of grain has been exceedingly low as most of the glumes were empty. A further trial will be established at the Central Agricultural Station for the 1959 autumn crop, and pregerminated seeds will not be used for planting as it is felt that this might have contributed to the extremely poor yield of previous crops.

Fertiliser Investigations on Rice

112. A number of fertiliser trials was carried out at the Cane Grove and Vergenoegen Land Settlement Scheme and on the Central Agricultural Station. These results have further confirmed those of previous experiments that on toxic soils which are high in exchangeable aluminium and sulphuric acid, phosphates in the presence of nitrogen in the form of a 10:20 mixture have given significant responses in yield of grain. One trial at Vergenoegen Land Settlement in the form of a randomised block design was carried out to test the significance of ammonium chloride and sulphate of ammonia in the presence and absence of phosphatic fertilisers. The results have shown that phosphate in the presence of nitrogen, whether in the form of ammonium chloride or sulphate of ammonia, gave a significant increase of about 500 lbs. of paddy per acre over the non-fertilised plots which recorded an average yield of about 2,400 lbs. per acre. Nitrogen "per se" whether in the form of sulphate or chloride did not give any increase in yield.

113. The results of several long term fertiliser trials extending from three to eight ye rs at the Mahaicony/Abary Rice Development Scheme were sta istically examined. It was found that in the majority of ex eriments there were small but consistent responses in yiel of grain to applications of nitrogen, phosphate and lime. There was no response to potassium but potassic fertilise s were included in a few experiments. The soil type was a pegassy clay. Further analysis of the yield data has shown that seasonal variation was the most significant single factor.

114. Field experiments were carried out to investigate

the responses to the micro-nutrients manganese, iron, boron, copper, zinc and molybdenum. Although there was a small response to most of the micro-nutrients used, it did not attain a level of significance. Manganese sulphate was applied as a top dressing two months after sowing at 50 lb. per acre to an experiment on pegassy clay at the Central Agricultural Station. There was a significant increase in yield of about 300 lb. of grain per acre over the no-treatment plots which gave an average yield of about 3,500 lb. of paddy per acre. Further investigations on the role of micro-nutrients in the nutrition of rice are being undertaken and soil and plant analysis are being made.

115. Forty-three demonstration trials were carried out on farmers' holdings scattered all over the rice producing areas of the Colony to test the 10:20 mixture of nitrogen and phosphate at the rate of 1 cwt. per acre recommended by the Department. The size of the plots was approximately one quarter of an acre. The increases in yield were most outstanding. The results of the demonstrations and the areas in which they were carried out are shown below:-

District	No. of demonstrations	AVERAGE YIELD IN BAGS PER ACRE No fertiliser	Fertiliser	Increase
West Demerara	19	18.6	23.2	4.6
Essequibo	11	14.4	21.2	6.8
Berbice	13	17.0	24.1	7.1

One bag = 140 lb. Paddy

116. From all the trials the average increase in yield of paddy per acre was 4.6 bags over the no-fertiliser plots which gave an average yield of 18.6 bags per acre. For the 1959 autumn crop further demonstration trials on farmers' holdings will be carried out in order to investigate whether the present recommendation of 1 cwt. per acre of a 10:20 mixture needs revision. The most dramatic increases in the order of about 1,000 lb. of paddy per acre from the 10:20 mixture came from toxic soils which are naturally high in exchangeable aluminium and sulphuric acid.

Red Rice and its Control

117. The field by field survey which was started in 1951, was continued and the general trend was an increase in the incidence of red rice compared with past years. The index for the Mahaicony/Abary Rice Development Scheme where the survey was carried out has risen from 14.51 % in 1956 to 22.84% in 1957 and to 26.14% in 1958. This steep increase is attributed to the dry weather at spring experienced for the last three years. In one particular section of the Scheme the increases in incidence of red rice for the past three years were as follows:-

Year	% Red Rice
1956	15.97
1957	31.82
1958	44.07

118. The value of wet cultivation as a suppressor of red rice has been observed again in 1958. The incidence for the wet cultivated areas of the Scheme was 7.68% compared with 30.57% for all other forms of dry cultivation. Eight wet cultivated fields with adequate control of water had a red rice index of 0.93% compared with an index of 11.65% from wet cultivation where water control was not

satisfactory. These results emphasize the need for efficient control of water in the suppression of red rice. Deep ploughing has also given some reduction in the incidence of red rice but again unless there is adequate inversion of the soil, this method does not give satisfactory control.

Insect Pests and Disease

119. Outbreaks of paddy bug (Mormidea poecila) occurred in the Essequ bo Islands during the spring and autumn crops and also in Berbice during the autumn crop. About 2,200 acres of rice were affected resulting in some reduction in yield and quality of grain. Experiments were carried out by the method of drif-dusting to determine the effectiveness of Agrocide 7 and 10 in the control of the pests. It was found that Agrocide 7 at the rate of 15 lb. per acre with Pyrex as carrier was effective, but that the same insecticide when mixed with limestone was unsuitable for use with the Motoblo.

120. The rice water weevil (Lissorhoptrus sp.) caused considerable damage to rice in some areas and the situation was particularly aggravated by the prevailing dry weather since it was difficult and at times impossible to drain the land to assist in controlling the pest, on account of the water shortage. Experiments are in progress testing out seed treatment with Aldrin, Dieldrin and Dieldrex C as a means of controlling the rice water weevil. Periodic changing of water in the rice fields also assist in keeping this pest under control.

121. The heaviest incidence of Blast (Piricularia oryzae Cav.) was observed in the Colony on the East Bank of the Demerara and Berbice rivers. Approximately 1,000 acres of rice were severely affected resulting in a heavy reduction of yield of grain. Resistant varieties obtained from India and Malaya are being tested and spraying experiments with organo-mercuric and copper fungicides are being employed.

Rice Storage Investigations

122. These investigations which commenced in 1955 were continued by the Entomologist-in-Charge at the Central Agricultural Station.

123. Under local conditions, the most important insects attacking both paddy and rice are Calandra o zae L), Rhizopertha dominica (Fabr.) and Sititro a cerea ella Ol v.). The greatest damage to paddy and rice is cause y a an ra and Rhizopertha and the financial loss could be very high.

124. A survey was made of storage conditions at mills and it was found that apart from the two Government owned mills, they were very unsatisfactory at the smaller mills. In addition, it was discovered that the moisture content of paddy taken into storage in these small mills was too high (15% to 16%) and this tended to hasten deterioration of the paddy and ultimately the quality of rice was reduced. Investigations on improved storage have shown that small cultivators and millers could with simple and not too costly equipment successfully dry their paddy to suitable moisture content before storing and that in-bin storage should be the practice. On account of the uncertainty of the weather conditions which are normally too wet, it is felt that the use of supplementary heat for in-bin, on-farm drying and bulk storage at mills will be needed. Various drying systems have been studied and a more detailed repo by the officer in charge of the investigations will be issued. The proper method of stacking grain and the arrangement of stacks within the bon makes possible a more

efficient use of insecticides in spraying. Fundamental studies on the life history, increase and control of the more important insect pests were made.

GRASSES

125. At the Central Agricultural Station, the grasses Pangola (Digitaria decumbens), Locuntu (Ischaemum timorense), Para (Brachiaria mutica), Nadi Blue (Dicanthium caricosum) and Coastal Bermuda (Cynodon dactylon) have been tried out and the promising ones are to be used in rotational grazing trials. Locuntu grass has not done well on the coastal alluvium soil of the Station, but Pangola and Coastal Bermuda have been outstanding. These two grasses have given very good growth and yield under semi-drought conditions experienced in 1958 and their overall performance has shown that they would be suitable for further extension on the coastal belt. Grazing and fertiliser trials are being carried out.

126. In the North West District on the worn-out deep pegasse soils which will no longer support root crops, Para grass (Brachiaria mutica) and Locuntu grass (Ischaemum timorense) have given good yields with normal fertiliser application of nitrogen and phosphate. There is every indication that the rearing of cattle on the riverain lands can be based on these grasses.

Botanical Survey

127. The primary object of the survey has been to collect plants on the Intermediate Savannahs at Waranama and Ebini, Berbice River, as a contribution towards investigations into the problem of cirrhosis of liver in cattle at Waranama and in adjacent areas. About 1,000 specimens were collected at Waranama and about 1,400 at Ebini. A Botanist from Kew Gardens was made available by the Colonial Office to undertake this survey.

128. Three species of Crotalaria (C. Maypurensis), (C. Retusa) and (C. Stipularia) were found at Waranama. (C. Maypurensis) growing sporadically and in small amounts is a possible suspect. Seeds were obtained from Waranama and are being grown at the Central Agricultural Station for feeding trials.

Weedicides

129. The Sugar Industry is the main user of modern weedicides but a wider application of herbicides to rice, coconuts and other crops is gradually taking place, and continual research on the use of new substances, methods and times of application have become a routine function of the Division of Economic Botany of the Department.

130. 2,4-D is one of the most widely used weedicides and it is sprayed by hand or by aeroplane against the complex of non-gramineous weeds which occur in sugar cane fields. The 50% amine formulation of 2,4-D remains the best and cheapest method of weed control for maize, either when applied pre-emergence or when the maize is about 5" high. An application of 1 pint per acre is sufficient to control any immature non-gramineous weeds. This same weedicide at the same rate of application is also most effective in controlling Jussia (Fimbristylis miliacea) and is partially effective against Soap Bush (Sphenoclea zeylanica) which are common weeds found in rice fields. Its use in rice, however, is limited in that it cannot be applied before five weeks otherwise damage to the rice would result. The danger of drift with 2.4-D is greater

than with most of the other weedicides tried, due to the extreme susceptibility of most garden and ground provision crops. This danger could be largely overcome by using the non-volatile amine formulation of the weedicide and employing a nozzle which gives rather coarser droplets than the usual fine spray nozzles.

M.C.P.B. 2.4-DB type

131. The weedicides Tropotox, Legumex M and Legumex D are almost as effective as 2.4-D against most non-gramineous weeds and have the advantage of being less toxic to certain crops. Tropotox can be largely applied on maize at up to two pints per acre as post-emergence; it can also be applied to seedling rice at three weeks of age without damage. Legumex M is safely used at one to one and a half pints per acre on cowpeas and black eye peas either as pre-emergence or post emergence at the three-leaf stage.

2.4,5-T. type

132. A mixture of 25% 2,4,5-T and 25% 2,4-D was used in experiments at Central Agricultural Station. The most common bush weeds have been successfully controled by an application of 3 pints per acre in 50 gallons of water sprayed on the foliage. The application needs to be repeated at 3-week intervals until the bushes cease to produce new shoots. This weedicide should be useful in coconut plantations and investigations are in progress to determine whether young coconut seedlings will be damaged.

Dowpon or Dalapon

133. Further experiments have demonstrated that this weedicide is comparatively cheap and very effective for control of grass and nutgrass when applied at repeated doses at 2 lb. per acre in 20 gallons of water. Applications should be repeated at ten-day intervals either once or twice. This same rate of application will kill "Volunteer rice" so long as the ground is free of water. This weedicide has possibilities for selective weed control as it had proved very effective in controlling the grass Echinochloa colonum without damage to seedling Jute.

Simazin (50% Chloroaminotriazine)

134. This weedicide was used for aquatic weed control with disappointing results. It was also used as a pre-emergence application in maize but the results were not as good as when 2.4-D was used. When this weedicide was used at 4 lb. per acre as pre-emergence in cotton, severe stunting of the plants occurred. Further trials are in progress.

C.I.R.C. (As a 4 lb./Gallon formulation)

135. This weedicide has been found to give variable weed control of only a few species. It severely damaged established cotton and also caused damage to young rice.

Dinoseb (As Dynotox)

136. This weedicide at the rate of nine pints per acre does not harm cowpeas or black eye peas either pre-emergence or post-emergence at the three leaf stage. Further trials are in progress.

P.C.P. (As Kanex, a 16% formulation)

137. This weedicide has been effectively used to control water "moss" (Cabomba aquatica) in canals at the Central Agricultural Station, when applied at the rate of two

gallons per acre of water surface. It has also been effective against Razor grass (Paspalum virgatum) at the rate of one gallon in 20 gallons oil.

Amino-triazol (As Weedazol, a 50% formulation)

138. A mixture of six pints per acre of Weedazol and three pints per acre as Kanex was tested against a mixed weed flora in dry drains and found to be unsuccessful.

Eptam

139. This weedicide was tested for control of "dropped seed" in rice, but was found to be unsuccessful. The conditions under which it was tried conformed perfectly to the requirements stated by the manufacturers. It does not hold much promise for control of "dropped seed" in rice.

Soil Surveys

140. Surveys were carried out on the coast and in the interior. Soil surveys were limited in the interior due to lack of accurate topographical maps. A report on the soils of the Rupununi Savannah was published by the Regional Research Centre of the British Caribbean, Imperial College of Tropical Agriculture, Trinidad. The report confirms that the soils are of comparatively poor fertility and recommendations were made for their management.

141. A survey of the Bartica triangle was completed and the report of the soil analysis was forwarded to the Regional Research Centre, Trinidad, where a report is in the process of being compiled. The chemical analysis has shown that the soils are very poor in available nutrients. A reconnaissance survey was completed in the Moruka area at the Kumaka-Quebena ridge of the North West Amerindian reservation. This area will be developed for coconuts and the preliminary indication is that suitable soils occur in patches in the area for this crop. It is estimated that around 10 to 12 thousand acres of suitable and fertile soil would be available for coconuts and other crops.

142. Detailed surveys were made of the rice soils at Vergenoegen and Cane Grove Land Settlements in order to demarcate the areas of the various soil types in keeping with the requirements of the Rice Farmers' Security of Tenure Ordinance for the fixing of rental. In these Settlements high aluminium and sulphuric acid in some of the soils make them very unproductive for rice and in the Rice Farmers' Ordinance such soils are described as 'toxic' soils at a significantly lower rental than the better soil types.

143. The report of the reconnaissance survey of the soils of the coastal belt by helicopter which was carried out under the International Cooperation and Administration of the United States Operation Mission has been completed. The report is very comprehensive describing the various soil series mapped and the fertility status of the soils in relation to the crops that are best suited to the areas. The soil maps will provide the necessary information for the utilisation of undeveloped land for crop production.

JUTE

144. The Jute cultivation at the Central Agricultural Station which at one time occupied the greatest acreage (200 acres) of any crop under cultivation was very disappointing and it is evident that a toxic soil condition and the climate are responsible for poor growth. The yield of fibre per acre has been below normal due to the plants not growing to a satisfactory height. Both capsularis and

olitorius varieties were tried out and they appear to be very susceptible to high exchangeable aluminium in the soil. The harvesting and processing of jute has been satisfactorily mechanised and as all this equipment is available, it is proposed to introduce a few experimental plots of the Segama variety from Malaya which originally was imported from North Borneo. In addition, other fibre crops such as Abaca, Sum hemp, Kenaf, Urena, and Crowa are being investigated on a small scale.

COTTON

145. From the results of experiments scattered on the major soil types of the Colony, the conclusions so far drawn are that the unreliability of the seasons for land preparation and harvesting makes the crop hazardous. The pegasse soil is not suitable for cotton and very poor results were obtained. When heavy applicatio s of lime and phosphate were made the results were greatl improved on this soil type but the crop would be unable to bear the costs. The sand reef soils, which are very li ted in occurrence, are the only suitable soils from the esults of trials carried out over a period of years, but ne ertheless, the crop requires comparatively heavy applications of fertilisers. Black arm disease resistant variet es must be used and BLR 12/25 and BAR XL1 are the most suitable. The practice of cutting back the cotton plants to allow a second picking from new growth in the following season shows considerable promise and is being further investigated. Variety BLR 14/25 gave a satisfactory yield as a first ratoon crop, the yield ranging from 588 to 658 lb. of seed cotton per acre. The variety BAR XL1 grown as a second ratoon crop gave a yield of 585 lb. of seed cotton per acre. During 1958 dry weather and a severe infestation of the leaf-eating caterpillar (Alabama argillacea) affected the yields of most cotton plots.

146. Mulching has proved to be of value in maintaining yield in dry weather and the insecticide dieldrin at a concentration of about 1% is effective for the control of Alabama argillacea.

147. Farmers' trials have commenced in 1958 with the two promising varieties BLR 14/25 and BAR XL1, but on account of the dry weather experienced at planting it is doubtful if a satisfactory crop will be obtained.

Crop Production Trials

148. Introduction of varieties of Tomatoes, French beans, Pole beans, Mung, Black eye peas, Urid, Cucumber, Egg plant, Musk melon, Water melon, Ochro, Cauliflower, Onions, Sweet Potatoes and Field corn were made for quality and disease resistance. The main sources of the planting material were the United States o America, Canada, Hawaii, Puerto Rico, Costa Rica and Mexic , but it is intended to widen the field of search.

149. The main emphasis was p ced on Tomatoes in a search for varieties resistant to Bacterial Wilt, Spotted Wilt virus, Mosaic, Phoma fruit rot and Collar rot. Twenty varieties from the United States were tested but natural incidence was low. Bacterial Wilt virus, Mosaic and Blossom End rot were recorded. Seed selections were made. The trials with legumes and onions are regarded as particularly important as there is a possibility of replacing sizeable imports.

150. A variety of pulses are being grown at the Central Agricultural Station and this phase of research is given priority in an effort to find a suitable legume to replace the

imported article which forms a very substantial proportion of imported foods in the Colony. Emphasis is also placed on trials with different varieties of onions to replace the imports but so far the germination of seeds has been very disappointing.

151. Other crops being introduced are Castor bean, Black Pepper, Ginger, Turmeric, Resistant varieties of Bananas, Ground nuts, Abaca, Kenaf, Urena, Jute, Crowa, West African oil palm, Sesamum and Pigeon peas of different varieties. The semi-drought conditions during the latter half of 1958 have hindered this work.

COCONUTS

152. The policy to encourage the expansion of coconuts to meet the shortage of edible oil is being implemented by the production of quality seedlings for expanded cultivation and the rehabilitation of old plantations. Over 10,000 plants were sold from the Central Agricultural Station in the latter half of the year at 5¢ each and a target of 70,000 plants has been set for 1959. An Agricultural Officer has been appointed to work on the problems of coconuts and one of the primary objectives is to discover high yielding palms for seed production. Indications are that about 7% of palms are outstanding.

153. Fertiliser experiments carried out over the past years on farmers' holdings have indicated response to limestone and a mixture of nitrogen, phosphate and potassium. The present recommendations for mature and bearing trees are twenty pounds of limestone per tree applied once in about four years, four pounds of sulphate of ammonia, three pounds of triple superphosphate and three pounds of muriate of potash, per tree, applied once per annum. The above formula corresponds to 10 lb. per tree of an 8:12:15 mixture. In the Pomeroon River, where mature and bearing trees have been dying at an increasing rate, fertiliser experiments have shown that the death rate was reduced somewhat by the use of mixed fertilisers of NPK and magnesium and in some instances the life of the palms was prolonged. However, it is evident that the soil of this area where the death rate is alarmingly high is of a pegassy nature and is unsuitable for coconuts. This type of soil will only support coconuts for a comparatively short period of about 15 to 20 years.

Pests and Diseases

154. Outbreaks of the coconut caterpillar (Brassolis sophorae) which brings about defoliation were reported from Essequibo, Demerara and Berbice. The outbreak at No. 10 West Coast, Berbice, was particularly severe and about 30 acres of palms were almost completely defoliated. Hand cleaning and spraying of the trees with a 0.5% solution of dieldrin were the control measures recommended.

155. The coconut moth borer (Castnia daedalus) continued to affect yields in areas where coconuts are grown on heavy clay and poorly drained soils. A 1% solution of dieldrin applied at the rate of four pints per tree has proved effective in controlling the pest. However, because of the need of expensive spraying equipment and the cost of the insecticide, few farmers have made serious attempts in following the recommendations for control.

156. No new outbreak of the locust (Tropidacris latreillei) was reported during 1958. A number of bearing trees died from Bronze Leaf Wilt during the semi-drought conditions experienced in the latter half of 1958. The death rate was observed to be highest in heavy and poorly

drained soils. An outbreak of Bud Rot (Phytophthora palmivora) was observed at Plantation Park, Mahaicony, resulting in the death of about 15 bearing palms. The affected trees were cut and burnt.

CITRUS

157. Fertiliser trials carried out at Plantation Georgia, left bank of the Demerara River, on the banks of the Pomeroon River, at Bartica, and in the North West District, have indicated that an 8:12:15 mixture of N, P and K at the rate of 5 to 6 lbs. per bearing tree twice per annum and just before the bearing period has given significant responses in increased number of fruits of good quality and in addition the trees had a very healthy appearance. Sometimes, depending on the age and condition of the trees, eight pounds of the mixture was used in one application per tree. In the Pomeroon River, where the soil is pegasse (peat) of nearly three feet in depth, 10 lbs. of limestone per tree once in about two to three years in addition to the NPK mixture proved very useful. Trees which had not borne fruit for 25 years since they were planted gave a good crop. In the North West District where the soil is of ironstone formation (lateritic clay) excellent responses were obtained from application of fertilisers. The orchard at Hosororo Station is being extended.

158. At the Central Agricultural Station varieties of Oranges and Grapefruit from Trinidad are being established.

Pests and Diseases

159. There was no serious outbreak of pests. At Parika, Beterverwagting and Triumph and on the East Bank of the Berbice River, the Black Bee (Melipona guianae) was controlled effectively by D.D.T. and Malathion.

160. No serious outbreak of any disease was reported. Anthracnose (Colletotrichum sp.) was observed on plants growing at Atkinson Field, East Bank Demerara and in Berbice. Spraying of affected plants with Perenox, maintenance of adequate level of soil fertility by application of fertilisers and pruning were the control measures recommended.

VETERINARY SERVICES

161. The Assistant Director (Veterinary) is in charge of the Veterinary Service of the Department which comprises five Veterinary Officers and Technical Assistants. These officers are stationed at New Amsterdam for the Berbice district, at the Central Agricultural Station for the East Coast Demerara, at Georgetown for the West Coast Demerara and Essequibo districts, and at the St. Ignatius Livestock Station for the Rupununi area.

162. The function of the Veterinary Officer in the district is to diagnose animal diseases, to treat sick animals and to take measures to prevent the spread of infections and contagious diseases. The main measures adopted are prophylactic innoculation, isolation, restriction of movement and the slaughter policy on occasions. He has laboratory and field assistants and in addition the Field Assistants of the Extension staff undertake the treatment of minor ailments assistance at parturition and first aid.

163. The Veterinary Officer also advises on animal husbandry and nutritional problems and is an integral part of the Extension Service on these matters.

164. The animal breeding policy of the Department is carried through by the Veterinary Division and a Veterinary Officer undertakes the direct supervision of the Central Agricultural Station's Stock farm where the Colony's main breeding stock are kept.

165. The Artificial Insemination Service is centred on the Central Agricultural Station where the bulls are kept, and semen is collected, prepared and despatched to the districts. The Service operates on the whole of the coastal belt.

ANIMAL HEALTH

166. The main outbreaks of disease during the year were Paralytic rabies and Equine encephalomyelitis reported on page 8 of Section I. The prevalence of poultry diseases was also mentioned.

167. Other bacterial and virus diseases occurring sporadically were Contagious Abortion in cattle caused by vibrio foetus and Trichomonas, Mastitis and Fowl Pox (Yaws). The Protozoal diseases Anaplasmosis and Piroplasmosis were encountered frequently and treated successfully with Terramycin. Cases of Trypanosomiasis in horses and cattle and Trichomoniasis occurred apasmodically. Coccidiosis gave some trouble with young cattle and was still responsible for a good deal of mortality in young chicks. Salmonellosis also occurred.

Parasites

168. Internal and external parasites are of general occurrence. The drug generally used for worms is Phenothiazine but Piperazine and Tetrachloroethane were also used.

169. Ticks and Screw worms are numerous and troublesome. Regular treatment with Gammatox fluid and Paste dip is necessary but Coopers Screw worm and Ear tick remedy is an effective preventive against Screw worm.

Fungus Diseases

170. Moniliasis, Aspergillosis and Favus were encountered as well as two cases of Fungus Mastitis in cattle.

Veterinary Research

171. No comprehensive programme of research could be undertaken with the staff available but there were limited studies on the fertility of hatching eggs, tranquilising drugs and the poisoning of water supplies in the Rupununi by use of the root of White Hiari (Lonchocarpus spp.).

Labbratory Clinical Services

172. The following number of examinations were carried out:-

Animal & poultry	- 1,248
Faecal samples	188
Post-mortems	181

ANIMAL HUSBANDRY

173. The Department's policy is to encourage all types of Animal Husbandry and to foster livestock production. In addition to advice given to the farmer by Veterinary and Agricultural Officers on the management, feeding and housing of livestock, the Department maintains three Livestock Stations at the Central Agricultural Station on the East Coast, at Ebini on the Intermediate Savannahs and at St.

Ignatius on the Rupununi Savannahs. The two latter stations are almost entirely concerned with beef production. Reports on the activities of all three stations are given below.

Animal Breeding Policy

DAIRY CATTLE - Cross bred Friesian-Zebu (Sahiwal) to produce an animal suited to local conditions;

BEEF CATTLE - Santa Gertrudis, S hiwal Zebu) and Jamaican Brahman) crosses

PIGS - Large White, large Black;

SHEEP - Improvement of local mutton types; experimentation with Border Leicester crosses;

GOATS - British Alpine

CHICKENS (for eggs) - Rhode Isla d Reds; White leghorns.

174. The Livestock Industry is served by the Artificial Insemination Service for Dairy catt e by the sale of bulls from the Ebini and St. Ignatius Sta ions and by the sale of breeding stock of all the other types of livestock maintained. A hatchery for chicks is operated at the Central Agricultural Station.

LIVESTOCK FARM (Central Agricultural Station)

175. Cattle: The total number of cattle carried on the Livestock Farm was 143, comprising of 17 bulls, 92 cows and 34 calves. 19,148 gallons of milk were produced the average daily production per cow being two gallons with the best cow producing over four gallons per day. These promising returns were attributable to the practice of feeding to production and high level feeding prior to calving.

176. One bull Craigiemains Epic died from anaplasmosis and three bulls, Onderneeming Caesar, Durban Archie Romeo Posch and Brimstage Commander were sold for slaughter on account of infection with trichomoniasis and senility.

177. The Dairy Heifer Scheme carried 199 animals during the year, 193 female and 6 male (calves). Of these 20 were issued to farmers in the districts.

178. Horses: Two horses died during the year, one from chronic and incurable laminitis, the other from an encephalitic type disease. At year end there were three geldings on the farm.

179. Donkeys: During the year 4 animals were sold and 2 transferred to the Rupununi. At year end there were 7 donkeys (3 male, 4 female) on the Farm. Services were discouraged in order to prevent movement of farmers' stock on and off the Farm.

180. Sheep: During the year 30 animals (16 male 14 female) were sold as breeding stock, and 52 lambs were born. At year end there were 88 sheep (2 male 59 female) on the farm. The distribution of ewes wa stopped in order to build up the flock for 1959.

181. Goats: During the year 1 goats (13 male 5 female) were sold as breeding stock and 23 kids were born. At year end there were 21 goats (4 male 17 female) on the Farm.

182. Pigs: Distribution of pigs during the year consisted of 99 brought forward from the 1957 stocks and 234 of those born during 1958. The total number of births was 454 (247 male 207 female) with a litter average of 9.87 piglets. At year end there were 129 pigs on the Farm.

183. Poultry: The flock at year end totalled 1,404 consisting of 782 hens, 122 cockerels and 500 chicks. 50,654 eggs were produced of which 10,912 were incubated. 3,768 chicks were distributed.

184. All chicks were debeaked as a precaution against cannibalism and vaccinated against fowl pox and Newcastle disease. Customs hatchery was abolished on account of danger

in introducing disease.

EBINI LIVESTOCK STATION

185. The Research Officer, Mr. S.P. Legg, in charge of the Station was resident throughout the year. The Station is situated on the minerally deficient Intermediate Savannahs some 70 miles up the Berbice River. The cattle are kept on the open range and increasingly on fertilised pastures planted with improved grasses.

186. The primary objective of the Station is to find out how cattle can be grown economically on the minerally deficient savannahs, by feeding mineral supplements, fertilising, planting of improved grasses and proper management. If it is proved that this can be done and subsidiary cash and subsistence crops are grown a large area could be opened up for development. Citrus is a promising subsidiary crop.

The Herd

187. The constitution of the herds at the end of the year was as follows:-

Designation	Stock Bulls	Cows	HEIFERS 2 yrs.	HEIFERS 1 yr.	Young Bulls	Steers	Calves
Milking herd	1	9		1	2	6	2
Purebred Santa Gertrudis		3			2		
Miscellaneous stock	1	4	7		9	1	3
Crossbred Brahman Unit	1	4					1
W.P. 27 Unit	1	30				1	15
Sahiwal 35 Unit	1	52	-(23)				
Sahiwal D 83 Unit	1	11					7
Sahiwal C 1561 Unit		20				3	5
Sahiwal Tobago Punch	1	5	11				
S. Gertrudis 2	1	56				-	26
" " 177	1	60	3				36
" " 182	1	68		17		1	40
" " 200	1	79					30
Steer herd							97
Weaned heifers and steers				28		4	
Other heifers and steers		1	20			29	
Draft oxen						6	-
Kimbia herd							
Experimental steer herd						48	
Total	12	402	44	46	13	193	165

Total number of animals - 875.

188. The breeding policy continued to be the grading up with Santa Gertrudis and Sahiwal bulls in single sire breeding units. Both lines are proving satisfactory and the Santa Gertrudis is quite prepotent for colour. The herd contains a good deal of Zebu blood. The more recently imported Zebu animals from Jamaica are leggy and excitable.

The Range

189. Productivity on the open range is low and the animals are fed a trace elemented mineral supplement, without which they do not survive. Animals consume just over one ounce per head per day. Experiments have now commenced to compare the growth rate, fertility, reproduction rate, etc., of animals on improved pastures as compared with the open range. Copper, Cobalt and Molybdenum are thought to be the deficient trace elements.

Improved Pastures

190. The total area of paddocks is 529 acres divided into 59 units. The main types of grass are Pangola (Digitaria decumbens) and Bahia (Paspalum notatum). These grasses require regular fertilising and rotational grazing management. It is also evident that the pangola grass requires some form of cultivation at intervals. Table XII gives some indication of the productivity of these pastures.

TABLE XII

The Productivity Of Pastures

Range No.	Approximate area (acres)	Total animal grazing days Mature	1-2 years	Calves
1	19	836	2,626	251
2	80	329	3,207	555
3a	7.6	228	1,150	212
3b	11.2	197	2,565	16
4	7.0	2,097	-	46
5	14.0	2,148	-	137
	52.4	5,427	6,264	4,999
7	11.3	-	-	-
8	26.3	1,038	2,039	279
9	53	11,040	-	2,950
10	75	-	-	-
11	86	2,698	266	2,054
12	80	3,241	467	2,599

191. The Bahia grass is slower to establish t an Pangola and is not nearly so palatable but it ppears possible to graze it every four weeks. It can stand over-grazing better than Pangola. On Pangola grass an experiment was commenced to compare the liveweight changes and reproductive performances of a group of cows grazing on this grass but with access to the range as compared with a group on the open range alone.

192. A group of 48 steers were placed on Pangola grass to study their growth rate. The stocking rate is over one animal per acre. It seems that these animals might be marketed economically at two years old.

TABLE XIII

Calving Interval For Cows Calving During 1958.

Interval	MONTH OF CALVING Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Less than 351 days	-	1	2	-	-	-	-	-	-	2	2	
351 400 "	-	-	-	1	-	-	-	1	1	-	1	-
401 - 500 "	1	3	2	5	4	-	3	1	1	1	3	3
501 - 600 "	-	-	1				1	-	-	-	2	7
601 - 700 "	-	-	-				-	-	-	2	3	5
Greater than 700	-	-	-	-	-	-	-	-	-	-	-	3
1st Calf Heifers	2	3	3	3	2	4	9	4	4	4	10	8
Unknown Interval	7	11	9	7	5	3	-	1	1	5	8	6

193. The recording of calves began only in January 1957. This accounts for the large number of unknown interval calvings. It does not follow that these are greater than 700 days.

Liveweight gain of Steers

194. The regular weighing of steers from the unimproved range indicated an average gain of ½ lb. per day as in 1957.

Slaughter figures for Steers

195. During the year, thirty-one steers were sold to Reynolds Metals Company, Kwakwani. These have been 1954 and 1955 steers. Particulars of carcases, offals, etc., are given below:-

	Mean Weights, lbs.
Liveweight	890.6
Carcase (killing out % of 45.7)	407.4
Hindquarters	201.8
Forequarters	205.5
Head	41.1
Hide	48.9
Feet	18.2
Liver	10.7
Heart	3.4
Alimentary canal complete	229.0
Lungs, trachea, etc.	10.7
Kidneys	1.5
Tail	4.3
Butcher's trimmings	30.9

Growth of Calves

196. The mean birth weight was 60 lbs. and the liveweight at 360 days, 416.3 lbs. This gives a daily liveweight gain of 0.98 lbs. Male calves were heavier at birth i.e. 62.8 lbs. compared with 56.6 lbs. for females, and they remained heavier throughout the year; at 360 days the mean liveweights were 421.5 lbs. for males and 403.9 lbs. for females.

197. The following factors probably influence the growth of calves - the season of birth, the genetic contribution of sire and dam, the milk supply of the dam, probably the most important environmental factor, the productivity of the range or pasture.

ST. IGNATIUS LIVESTOCK STATION

198. The staff position was not entirely satisfactory during the year. The Agricultural Officer in charge of the Station was on leave from August. The Veterinary Officer did not return after he went on leave early in the year. Other officers had to act temporarily on the Station.

199. The work of this Station in the Rupununi is to develop and demonstrate methods of cattle management under local conditions of ranching, to breed and grade up cattle suitable for the poor conditions of the savannahs and to study problems of mineral feeding diseases and parasites.

The Herd

200. At the end of the year the herd was as follows:-

Bulls	10
Cows	169
Calves	108
Heifers & Steers	176
Total	463

Figures for the year:-

Calves born	130
Steers & culls slaughtered	23
Deaths from various causes	27
Sold to ranchers (breeding bulls)--	10
Cows bought	1

201. The pure bred Santa Gertrudis herd now consists of three bulls, two cows, two heifers, one heifer calf and one bull calf. Forty nine half bred Santa Gertrudis calves have been born on the Station and show promise.

202. The Jamaican Brahman animals introduced in 1957 have produced a total of eighteen half-bred calves to date. It is intended to keep the half-bred animals from these crosses and the Santa Gertrudis as separate lines.

Fencing

203. The fencing programme was completed in December and involves over 100 miles of fence. There are ten station paddocks and mineral and salt feeding troughs were installed. The weighbridge was installed at the Central Corral and the routine weighing of calves commenced.

Improved Pastures

204. The dry weather during the last quarter of the year had a most adverse effect on the improved types of grasses. Two fields of Pangola grass (Digitaria decumbens) totalling 13 acres were planted in June and started well with the application of a mixed fertiliser.

205. A further acre of Bahia grass (Paspalum notatum) was also planted and was holding its own. Other grasses being tried are Guinea grass (Panicum maximum), Jaragua (Hyparrhenia rufa) and Molasses (Melinis minutiflora).

OTHER CROPS

Maize

206. Experiments near the foothills showed the advantage of a complete fertiliser application and 3' x 1' spacing. The crop was a failure on the savannahs.

Guinea Corn - Failed.

Citrus

207. The orchard was extended with various types and is doing well.

Mangoes

208. Eighteen plants of No. 11, Jamaica Bombay and Julie were planted.

OTHER STOCK

209. The work horses totalled thirty-six and there was

one mule. Poultry are reared and also a pair of milch goats.

FISHERIES

210. The Fishery Services of the Department are operated as separate divisions covering the Marine Fisheries and the Inland bodies of water such as rivers, canals and reservoirs.

211. The main activity of the Marine Fishery Division was to foster the wholesale fish market and ancillary services made available for fishermen at the Government Marketing Centre. Facilities are provided for the landing and handling of fish, the treatment of nets, repairs to boats and the sale of ice to the fishing schooners. In addition, there is a fisherman's Canteen and Dormitory

212. Advice is given on fishing methods and it was possible to assist the newer trawling units in operation by loaning them the trainee mates and experienced deckhands from the Government Research Trawler "Cape St. Mary". The Snapper and Grouper fishing schooners were given assistance through the visit of Mr. Francis Taylor, an experienced snapper fisherman from the United States. Mr. Taylor's services were given by the International Co-operation Administration of the United States and he brought with him valuable reel equipment for trial and demonstration on the local fishing banks. He also showed the use of the Echo Sounder in locating fish and demonstrated methods of handling the schooner to keep it on the banks in the shoals of fish. The work will be followed up by the Department's Fishery Officer as the equipment was made as a gift to British Guiana.

Trawling Survey - F.R.V. "Cape St. Mary"

213. The 70-ton Fishery Research Vessel "Cape St. Mary" continued the trawling survey of the productivity of the waters off British Guiana between 10 and 100 fathoms. Analysis of the results of the survey are still continuing but a summary of catches from seven equal parallel boxes running from the shore into deep water at right angles to the coast is given in Table XIII. Box I is in the south-east adjacent to Suriname and Box VII in the north-west adjacent to Venezuela. Georgetown is in Box III and there is information on the fishing in this box and Box II throughout the year. The other boxes could only be fished twice a year.

214. The main commercial species proved to be the Sciaenids "Croaker" Micropogon furnieri (Desmarest), "Bangamaree" Macrodon ancylodon (Schneider) and "Sea Trout" Cynoscion virescens (Cuvier). Of the 332,000 lbs. of marketable fish landed during the first year of the survey (April 1957 to March 1958) Croaker made up 40% of the weight (135,000 lbs.), Bangamaree 14% (47,000 lbs.), and Sea Trout 9% (30,000 lbs.). Other categories of fish recorded in the catches included 'mixed small' (mostly Sciaenids and Carangids, Grunts, etc.), 14% of the total catch by weight (48,000 lbs.) "Catfish" (Felichthys spp., Arius spp., and others), 6% (21,000 lbs.), "Dogfish" and Sharks, 4% (13,500 lbs.), "Barracuda" 1% (3,500 lbs.), Snapper, 0.5% (1,800 lbs.) and other species 11% of the total catch by weight.

215. From the analysis of the data the following points emerge:-

(1) Except in the north west district, catches are poor (less than 150 lbs. per fishing hour) in water deeper than twenty

fathoms, and in the north west in water deeper than 30 fathoms;

(2) The better catches from deeper waters in the north west appear to be related to the type of bottom, mud being found out to 50 fathoms here (Box VII) in contrast with the south east (Box I) where a coral bottom is encountered between 20 to 25 fathoms. "Mud" and "mud sand" bottoms proved to be the most productive, ("mud and fibre-like weed" (hydroid) often found at the interface of mud and sand are as proved particularly productive), whereas "sand" and "coral" bottoms gave poor yields. Thus on the whole the trawl catches were better towards the north west where there was more mud, an poorer to the south east;

(3) Some spots are now known to be particularly good, e.g, the interfa e between mud and sand in Boxes II and I I which occurs at 12 to 13 fathoms and w ich yielded an average of 427 and 426 lbs., per fishing hour over the whole pe iod, the bulk of the catch being Sciaen ds;

There is as yet little evidence of regular seasonal movements of fish, the main species being present in catches at all times of year. There were, however, one or two exceptions to this, the fish disappearing from certain areas, viz:-

(a) in the north west district (Boxes VI & VII) grounds which were particularly productive in January and February, 1958, proved barren when revisited in June 1958. It was suspected that this disappearance might be connected with the heavy inflow of Orinoco water at this time after heavy rains;

(b) It was also noted that huge numbers of Dogfish and Sharks appeared at certain times, and the other fish then disappeared from these areas. The sharks did considerable damage to the trawl, tearing fish out of the net as the ba was lifted.

216. As was to be expected, the fish fauna of "mud" and "mud and sand" was differen from that over pure sand or over the coral bottom. The ciaenids which formed the bulk of the trawl catch were predominantly fish of mud and mud and sand bottoms. Snapper ere only very occasionally caught in any numbers (e.g, in Box I between 20 and 30 fathoms over coral and sand), largely because the bottoms over which snapper live are generally too rough and too steep for trawling.

217. Well over two hundred species of fish have been caught by the "Cape St. Mary" trawl in British Guiana waters. The fish found in the deeper water over coral were in many cases the same species as those found inshore around the West Indian Islands, and fis ch as the highly coloured "Butterfly" fishes (Cha todon .) and Parrot fishes (Scaridae) have now been a de o he list of fishes

found in the waters off British Guiana. Analyses of depths and types of bottom over which different species were caught are in progress. These analyses together with the examinations of the stomach contents of various species are giving a picture of the different communities and their food chains in the waters over mud, compared with those over sand or coral on the British Guiana shelf.

218. Studies of the biology of the main commercial species are also in progress. Ripe Croakers have been found in samples throughout the year and it seems that this species has no very definite breeding season in British Guiana waters. This is in contrast with the Bangamaree and Sea Trout samples in which ripe fish have only been taken at certain times and places. Relatively few small immature Croakers occur in the catches; there is evidence that these live further inshore in shallower water - indeed the fry move into the brackish water ponds at Onverwagt where they grow very well.

219. The Croakers caught in the trawl are generally between 20 to 40 cm., total length and 2 oz. to 1 lb. 10 oz. in weight, though larger fish have been caught (up to 48 cm. $2\frac{3}{4}$ lb.), particularly in the north west district. Both sexes mature when about between 21 to 24 cm., standard length and 5 to 8 oz. in weight. They feed on invertebrates such as Polychaete worms from the bottom mud. The Bangamaree feed on shrimps and small fish. They average 19 to 26 cm. standard length (4 to 8 oz.) and both sexes evidently mature when about 23 cm. standard length (about 6 oz.). The Sea Trout is another predatory species feeding on fish and large rimps. This species grow much larger and averages about 26 to 60 cm., standard length ($\frac{1}{2}$ to $3\frac{1}{2}$ lb.) but some up to 6 or 7 lb. have been caught. Both sexes appear to mature when about 37 cm., standard length and 1 lb. in weight.

220. During the year some samples have also been examined from Chinese and Pin Seine catches to see how many of the species caught by the "Cape St. Mary" are also caught by these other more inshore fishing methods, and whether the young stages of the "Cape St. Mary" caught fish occur in more inshore waters. On the whole the "Cape St. Mary" trawl fishes populations and species of fish which are untouched by these other fishing methods, though the young of Bangamaree and some other species are plentiful in the Chinese seines at certain times of year.

221. Identifications of the many species of fish coming into the brackish water ponds at Onverwagt as fry from the sea have also been continued during the year. Some of these are of particular interest as representing young stages of the fish caught by the "Cape St. Mary" trawl.

Inland

222. The dry weather in the latter half of the year resulted in low water levels of most rivers and canals and capture was facilitated in many places. Fish from canals and swamp areas along the coast was in good supply for most of the year but it is feared that the usual spawning has been delayed on account of low water levels.

Fish Culture

223. The culture of Tilapia mossambica in ponds continued but unfortunately many of the smaller ponds where the water supply was unreliable dried out. There are now about 440 ponds of varying sizes which have been stocked from the Departmental nurseries. There have been problems with predatory fish.

SUMMARY OF CATCHES (CATCH PER FISHING HOUR) IN DIFFERENT BOXES, AT DIFFERENT DEPTHS AND OVER DIFFERENT TYPES OF BOTTOM FROM START OF SURVEY (APRIL 1957) TO DECEMBER 1958.

DEPTH	BOTTOM		BOXE I	II	III	IV	V	VI	VII
Fa-		NO.STA.	14	9	11	-	1	-	-
Thoms	Mud	C.P.Hr..	290.0	165	81	-	110	-	-
	Mud &	NO. STA.		21	-	-	-	-	-
5-10	sand	c.p.h.	-	702	-	-	-	-	-
	Sand	No.Sta.	-	-	-	-	1	-	-
		c.p.h	-	-	-	-	230	-	-
	Mud	No.Sta.	24	41	101	46	20	6	-
10-15		c.p.h	667	274	313	199	348	258	-
	Mud &	No. Sta.	7	96	147	4	1	-	-
	sand	c.p.h.	300	427	426	90	205	-	-
	Mud &	No. sta.	-	-	-	1	-	-	-
	weed	c.p.h.	-	-	-	56	-	-	-
	Sand	No. Sta.	2	1	7	-	1	-	-
		c.p.h.	54	0	188	-	0	-	-
	Mud	No. sta.	-	-	11	1	56	53	13
		c.p.h.	-	-	289	15	376	465	488
15-20	Mud &	No. sta.	1	6	-	-	16	29	15
	Sand	c.p.h.	0	131	-	-	249	533	502
	Mud &	No. sta.	-	-	-	-	-	2	-
	Weed	c.p.h.	-	-	-	-	-	801	-
	Sand	No. sta.	-	1	2	-	-	-	-
		c.p.h.	-	0	388	-	-	-	-
	Mud	No. sta.	-	-	1	2	2	9	21
		cp.h.	-	-	0	147	1	524	314
20-25	Mud &	No. sta.	-	1	-	-	1	1	5
	Sand	c.p.h.	-	0	-	-	0	380	503
	Coral	No. sta.	3	-	-	-	-	-	-
	& sand	c.p.h.	137	-	-	-	-	-	-
	Coral	No. sta.	3	-	-	-	-	-	-
		c.p.h.	48	-	-	-	-	-	-
	Mud	No. sta.	-	-	-	1	1	1	10
		c.p.h	-	-	-	0	5	0	365
25-30	Mud &	No. sta.	-	-	4	1	2	-	-
	sand	c.p.h.	-	-	1	0	0	-	-
	Sand	No. sta.	-	1	-	-	-	-	-
		c.p.h.	-	0	-	-	-	-	-
	Coral	No. sta.	1	2	-	-	-	-	-
	& sand	c.p.h.	25	0	-	-	-	-	-
	Coral	No. sta.	1	-	-	-	-	-	-
		c.p.h.	20	-	-	-	-	-	-
	Mud	No. sta.	-	-	-	3	2	2	-
		c.p.h.	-	-	-	0	12	0	-
	Mud &	No. sta.	-	-	4	1	3	1	1
30-40	Sand	c.p.h.	-	-	4	0	17	33	0
	Sand	No. sta.	-	-	1	-	1	-	-
		c.p.h.	-	-	17	-	23	-	-
	Coral	No. sta.	7	-	-	-	-	-	-
	& Sand	c.p.h.	166	-	-	-	-	-	-
	Coral	No. sta.	6	3	1	-	-	-	-
		c.p.h.	13	0	35	-	-	-	-
	Rough ground	No. sta.	-	-	1	-	-	-	-
	soil	c.p.h.	-	-	0	-	-	-	-
	Mud	No. sta.	-	-	-	1	-	1	1
		c.p.h.	-	-	-	3	-	0	11
	Mud &	No. sta.	-	-	2	1	-	1	-
40-50	Sand	c.p.h.	-	-	0	0	-	9	-
	Sand	No. sta.	-	-	-	-	1	-	-
		c.p.h.	-	-	-	-	0	-	-
	Coral	No. sta.	2	1	-	-	1	1	-
		c.p.h.	0	0	-	-	0	20	-
	Rough ground	No. sta.	-	-	1	-	-	-	-
	soil	c.p.h.	-	-	0	-	-	-	-

DEPTH	BOTTOM		BOXES						
			I	II.	III	IV	V	VI	VII
Fathoms	Coral	No. sta.	-	1	-	-	-	-	-
		c.p.h.	-	2	-	-	-	-	-
50-60	Rough ground soil	No. sta.	-	-	1	-	-	-	-
		c.p.h.	-	-	0	-	-	-	-
60-70	Coral	No. sta.	-	1	-	-	-	-	-
		c.p.h.	-	20	-	-	-	-	-
Over 70	Coral	No. sta.	-	-	2	-	-	-	-
		c.p.h.	-	-	0	-	-	-	-

Onverwagt Fish Culture Station

225. The first cropping from a pond on this brackish water station was made and only 1,076 lb. of fish were removed. The largest fish were Bashaws (Cynoscion acoupa) 9 lb., Queriman (Mugil spp.) 7 lb., Tilapia 3 lb., and Croaker (Micropogon furneri). The development of this Station is to continue and construction work of a new intake canal from the sea and additional ponds was in progress at the end of the year.

Smoked Fish

226. Smoked fish was prepared from 1,800 lb. of cheap fish landed by the Fishery Research Vessel "Cape St. Mary". Some of it was hot-smoked or barbecued on an open kiln at Bagotstown Fisherman's Lodge while a very much better product has been prepared with the cool-smoke kiln at the Fisheries Laboratory. It has been found that the product is acceptable on the market and keeps for six weeks. However, unless the fish is initially available at a very cheap price (less than 10¢ per lb.), it will be difficult to make a product that can be marketed profitably. Catfishes, Bangamaree, Sea Patwa, Croakers and Mackerel were converted.

Aquarium Fish Trade

227. The weather has affected this industry quite adversely and supplies of fish for export have diminished. Collectors and exporters have complained that they have to go much further afield to obtain the species desired and the numbers available in many creeks are stated to be much reduced. The quantity of fish exported during the year was valued at $158,000.

EXTENSION SERVICE

228. The agricultural area of the country is concentrated along the northern coastline and rivers and is divided into five main districts, namely, Berbice, East Demerara, West Demerara, Essequibo and North West District. Each district is in charge of an Agricultural Officer, and is further divided into sub-districts with Field Assistants in charge of each sub-district. The District Field Staff numbered 41 in 1958.

229. The Extension Service is administered by an Assistant Director from Head Office, where there are additional officers dealing with specialised problems connected with extension, namely, Rural Youth, Information

& Education and Land Development. The Head Office staff numbered 7 in 1958.

230. After the completion of their training period which begun in 1955, the Field Assistants who were specially concerned with school gardens and rural youth work were integrated with the normal extension service. Three of these Field Assistants together with two from the Information Division were sent to Trinidad and Puerto Rico for further training in agriculture and extension methods.

Programme of Work

231. Extension officers worked towards definite programmes in their districts. Objectives included the following:-

Rice - Early planting, use of pure line seed, use of fertilisers, use of acetic acid in milling, increased acreage;

Sugar - Extension of improved varieties, control of froghopper, replanting after fourth ratoon, use of fertilisers, increased flood fallowing, improvement of drainage and transport canals;

Coconuts - Establishment of farm nurseries with nuts from selected trees, efficient husbandry, control of insect pests, increased acreage, use of fertilisers;

Vegetables - Greater use of mulch, organic manures, and artificial fertilisers, pests and diseases control measures;

Cacao - Increased acreage under clonal selections, formation of Co-operative Societies;

Citrus - Encouragement of farmers to do their own budding;

Fodder - Planting of improved grasses, establishment of fodder plots in areas short in pasturage;

Dairy Cattle - Castration of scrub bulls, encouragement in use of Artificial Insemination Service, regular de-worming of calves, improved feeding;

Pigs - Improved feeding and management, introduction of better breeds for market (Large White, Large Black and their crosses) early marketing, better housing;

Poultry - More intensive rearing, deep litter pens, use of balanced rations;

Sheep & Goats - Good management, castration of scrub males, upgrading;

Rural Youth - Consolidation of clubs, concentration on project work, training meetings for club leaders and officers;

School Gardens Maintenance and improvement.

Extension Methods

232. In order to carry out their programmes of work, extension officers put into practiceevery available method for meeting farmers, discussing problems and projects, and persuading them to adopt sound techniques for improved management and land use.

Individual Methods

233. Officers continued to use the personal individual contact with the farmer as their main method of furthering improvement. Farms were visited with definite purposes in mind to teach the farmers proper techniques of agricultural practice, e.g, proper applications of fertilisers, the right types of fertilisers to use, control of insect pests and diseases, correct care and management of livestock, the use of balanced rations, efficient planning for land use, etc. On these visits officers would distribute various requisites he travelled with, e.g, leaflets, bulletins, insecticides, seeds, etc. The results of earlier advice and the general progress of farming were specially noted during farm visits.

234. Apart from their farm visits, officers interviewed farmers all day during the course of their work. They met at home, office, demonstration station and on the farm and advice was freely offered during discussions.

235. During 1958, a total of 24,183 farm visits were recorded and 27,450 interviews were given.

Group Methods

236. While the regular servicing of farmers on an individual basis remained the officers' most effective approach, additional ways of extending their educational influence and spreading their contacts were widely adopted. These meant working through groups, by means of meetings discussion groups, film shows, demonstrations, field days.

237. Meetings and discussion groups covered many subjects of important interest to the agricultural community. Subjects discussed included pests and diseases control, latest improvements in crop and livestock husbandry, legislation, etc. Film shows were organised at many of these meetings in order to stimulate interest and draw bigger crowds into the discussions which usually followed.

238. Demonstrations were given on farms, house-lots, school gardens and on demonstration stations of the Department. Demonstrations included eradication of acoushi ant, caponising of birds, pruning citrus, fertilising rice, castration of bulls, spraying for insect control, etc. Method and result demonstrations were carried out on Field Days at the Demonstration Stations of the Department. Demonstrations on the farms themselves were held in form of

tours - Farm Walks - groups of farmers being taken from farm to farm in order to see what and how their fellow-farmers were doing in agriculture. Considerable interest and enthusiasm were aroused by these farm walks.

239. During 1958, extension officers reported 1,056 meetings called or attended, 31 film shows held, 479 demonstrations given and 16 Field Days held.

Mass Methods

240. Full use was made of leaflets, bulletins, radio, the press and agricultural exhibitions to reach the farming community. Leaflets and bulletins were distributed on the following subjects:-

Control of Rabies.
Control of smell in parboiled rice.
Rations for all types of pigs.
Pig rearing in British Guiana.
Two causes of low rice yield.
The Poultry Battery laying cage.
Coushi ant control.
Producing clean milk.
Information on Poultry management.
Control of froghopper.
Selection and management of swine breeding stock.
Deep Litter system of poultry management.
Use germinated Padi.
Fertilising Padi.
Bronze leaf wilt of coconut trees
Control of Rice caterpillar.
Starting a Citrus Orchard.
Prevent coconut caterpillar outbreaks.

241. The Farm Journal, a simple publication for farmers, containing informative articles written in simple language, was resuscitated in 1958 and quarterly issues begun.

242. Contributions were continued to the radio programme controlled by the Government Information Services. Many agricultural topics of timely interest were broadcast to the farming community.

243. Co-operation was maintained with the Government Information Services and through them with the newspapers. The Press proved to be a useful medium during the Drought emergency in warning farmers concerning the conservation of water and the control of fires.

244. Many persons within and without the farming community were reached through agricultural exhibitions held all over the country. The Department organised farmers' exhibits of crops and livestock to the Agricultural Fair and Pageant held at Lusignan, East Demerara in honour of the visit of Her Royal Highness, Princess Margaret. Exhibits of the Department's work were contributed to exhibitions arranged by the Union of Local Authorities in Essequibo and East Demerara and by the League of Coloured Peoples and the Indian Education Trust in Georgetown.

245. Crop and Livestock Competitions were held in conjunction with the Exhibitions of the Unions of Local Authorities, at which officers acted as judges.

SERVICES TO FARMERS

Sales of Agricultural Requisites

246. Officers continued to supply farmers with various farm requisites - vegetable seeds, veterinary drugs, stock feeds, fertilisers, insecticides, and fungicides. Stocks were distributed from the Marketing Division, District

offices, Demonstration Stations and very often officers travelled with small supplies in their knapsacks when visiting farms. Towards the end of the year, the Marketing Division ceased the supply of stock feeds and fertilisers to District Staff, with the result that farmers had to obtain their supplies of these items from commercial dealers.

Pure Line Seed Padi

247. Pure Line Seed padi was distributed to farmers through district officers. Varieties were No. 79 and D 110 and a total of 17,694 bags (140 lb. nett) were distributed, made up as follows:-

Berbice	8,906 bags
Demerara	5,984 "
Essequibo	2,804 "

248. Officers also supervised the production of pure seed by growers recommended by the Rice Producers Association. Berbice produced 200 bags and Demerara 163 bags of seed. This seed was bought by the Department and handed over to the Association for re-sale to farmers.

Economic Plants and Breeding Stock

249. The extension staff supplied farmers with various types of economic plants and breeding stock for the improvement of their farms. These included budded citrus plants, clonal cacao, grasses and legumes, vegetables, peas and beans, fruit trees, pure bred ducks, boars and sows, rams and bucks.

Duty Free Petrol

250. Government continued its policy of assisting agriculture by the grant of duty free petrol for land cultivations by machine, and officers were again entrusted with the task of examining applications and issuing licences. This task has become more and more onerous with the spread of mechanisation. The quantity of duty free petrol issued in 1958 is listed below:-

	1957	1958
	Glns.	Glns.
Rice	538,580	513,940
Sugarø	116,502	110,823
Ranching	2,240	3,010
Other	6,731	5,895
Total	664,653	633,668

ø Issued direct to Sugar Estates on the drawback system.

Local Authorities

251. Officers continued to work with and through Local Authorities to give greater service to farmers. They attended meetings, supplied up-to-date information and advice, joined in talks and discussions and assisted in working among farmers in connection with exhibitions.

252. Special assistance was continued to Community Projects in the three Counties, viz, Crabwood Creek in Berbice, Golden Grove - Nabaclis in Demerara and Huis t'Dieren in Essequibo. Officers helped the agricultural communities to frame their programmes and maintained close contact to ensure

that projects were carried out and targets achieved.

Regional Development Committees

253. Officers continued to serve on Regional Development Committees and their Area Sub-Committees. They investigated applications for loans in agriculture and by means of technical advice, guided the farmers and the Committees into the practice and support of sound economic projects. Self-help Schemes, Land Societies and similar group projects received critical assessment and encouragement.

Machinery Hire Pools

254. Officers continued, in their capacity as members of the Area Committees controlling the machinery hire pool, to advise on the requests for use of equipment in land clearing and drainage. Much work was done in the allocation of pumps used in rice areas during the 1958 drought.

Crop Valuation

255. Crop valuation was continued in the Boerasirie Extension Project and Black Bush Polder, as well as on numerous ad hoc enquiries whenever farmers' crops were destroyed on land compulsorily acquired.

Agricultural Education & Information

256. Agricultural education among school children was centred on the maintenance of school gardens. There were 106 school gardens in the Colony in 1958, 36 of these being in Berbice, 48 in Demerara and 22 in Essequibo. 65 schools were given maintenance grants and 17 schools were given special grants for building fences and purchasing tools.

257. Competitions were held in the three counties, the schools competing for individual prizes on a district basis and for the Bannister Shield on a Colony basis. Certificates were awarded on a year-round assessment.

258. Five Field Days were held for school children on the actual school gardens, where the demonstrations were carried out by the school children themselves under the guidance of their gardening teachers.

259. Radio scripts and news releases were furnished to the Government Information Service. The radio programme previously run by the Department was incorporated into the Government Programme "Rural Notebook" broadcast twice per week. 44 press releases were submitted for general publicity in the newspapers. A publicity campaign was carried out to increase the consumption of pasteurised milk. Re-issues of publications of older material are mentioned earlier above. The new publications issued for the year were as follows:-

(a) The Story of the Tilapia Mossambica
(b) Liming sour soils
(c) Mixed fertilisers for vegetable crops
(d) Germination tests with pure line seed padi
(e) Tractor operator's service guide
(f) Controlling Red Rice
(g) Mulching
(h) Fertilisers for better vegetable crops - how and when to apply

(i) Organic manure

(j) Blast in rice - its symptoms and control

(k) Atkinson Field - Cacao Field Day - fertilising cacao

(l) How to grow Onions

260. The Farm Journal, a simple journal for the farmer, written in simply language, was resuscitated in 1958. Three, quarterly issues were published in March, June and September. It contained many informative articles on crops, livestock, fish, machinery, etc., and was distributed throughout the Colony among farmers.

261. Film previews were organised in collaboration with the Rice Producers' Association, United States Information Service and Government Information Service. Selected films were loaned to the Extension staff for showing in the rural areas.

262. 52 original maps and charts were prepared for various divisions of the Department. 28 diagrams, illustrations and signs were prepared for agricultural exhibitions.

263. The photography section covered newsworthy events, and processed films and prepared prints needed for reports and press releases. As a special project for the education of farmers, weekly practical training courses were held in Plant Propagation, Beekeeping, Fish Culture, Dairy Husbandry, Pig Rearing and Poultry Management. Farmers were selected from the districts and brought to Headquarters where they were given lectures and practical demonstrations - they themselves were made to learn by doing the job. Fifty-six farmers attended these courses in 1958.

264. The Department continued the two year agriculture apprenticeship scheme. In 1958, six apprentices completed their training and nine new entrants were admitted, of whom two resigned.

RURAL YOUTH

265. In 1958 all rural youth activities which had been operating under a separate Division with separate field staff, were integrated into the general extension work of the Department. Staff training courses were held in each county.

266. A Home Economics book "Better Meals from British Guiana Foods" was printed for sale. A staff handbook and a leaflet on 4-H Clubs were reproduced for use. In addition, relevant literature on various subjects was secured for use in club programmes.

267. At the end of the year there were twenty-eight 4H clubs with a membership of 1,358 and twelve Young Farmers clubs with a membership of 319. The distribution of these is shown below:-

District	No. 4H Clubs	MEMBERSHIP	
		Boys	Girls
Demerara	11	138	321
Essequibo	12	189	284
Berbice	5	165	251
Total	28	502	856

District	No. of Local Leaders for 4H Clubs - Men	Women	No. Y-F Clubs	MEMBERSHIP Men	Women
Demerara	5	20	3	38	14
Essequibo	12	26	5	68	51
Berbice	8	17	4	100	48
Total	25	63	12	206	113

268. The project work of club members consisted of the following:-

(a) Agricultural - Gardening, Dairying, Poultry small stock, Bees, Fish. There were 360 projects in 1958 compared with 365 in 1957;

(b) Food and Nutrition - The teaching of the Food value of common foods and their methods of preparation and cooking. There were 475 projects in 1958 compared with 402 in 1957;

(c) Clothing - The teaching of designing and making home items and wearing apparel. There were 665 projects in 1958 compared with 407 in 1957;

(d) Home Improvement - The making of articles for the home for utiliarian and beautification purposes. There were 381 projects in 1958 compared with 238 in 1957.

269. Extension Officers worked among clubs, members, parents and leaders, and kept progress with project work in homes and on farms, in their endeavour to foster the rural youth movement. They attended 1,053 meetings, gave 791 demonstrations, held 2,843 interviews and made 4,667 farm and home visits.

270. A short course in Tractor Operation and Maintenance was held by one Young Farmers' Club in Essequibo.

271. Competitions were held in each county at Club Exhibitions including Achievement Days in Berbice and Demerara. Awards were given by the Department and by private donors.

THE PEASANT SUGAR-CANE FARMING INDUSTRY

272. The Extension Staff maintained special interest in the peasant cane farming industry and assigned a Field Assistant to work solely among cane farmers. This industry produced 3,692 tons of sugar valued $390,112 in 1958 compared with 2,628 tons valued $310,170 in 1957.

273. The Extension Programme worked towards the following objectives: Block Planting, Block harvesting, Delivery of Clean canes to the mills, Control of Froghopper, Distribution of planting material of high yielding varieties resistant to Leaf Scald Disease, Flood Fallowing, Application of Fertilisers, Improved Husbandry.

274. Froghopper pest was not evident during the year on account of the dry weather. 117 tons of planting material of improved varieties valued $1,420 were utilised in 1958, compared with 97 tons valued $1,204 in 1957. Fertilisers used in 1958 amounted to 5,359 cwt. valued $33,759 compared with 3,935 cwt. valued $24,928 in 1957. The drought prevented widespread use of flood fallowing, only 8 acres being flood fallowed in 1958 compared with 36 acres in 1957.

275. The price fixing Committee for farmers' canes continued under the Chairmanship of the Agricultural Chemist, who made periodic tests of juice samples at the factories. Prices fixed varied from $8.34 to $10.99.

276. The Extension Officers connected with the industry worked in close collaboration with the Central Cane Farmers' Committee.

BEEKEEPING

277. Although beekeeping is a minor industry, it combines both profit and pleasure for many persons in the community. In 1958 the Colony produced 104,000 lb. honey and 2,080 lb. beeswax, of total value $30,000. The Apiary Assistant continued to do extension work among beekeepers and, as Secretary to the Beekeepers' Association, was in close contact with the industry.

278. 324 visits were paid to beekeepers and many demonstrations given to beekeepers and schools. Ten persons received a four-day course of instructions at the Botanical Gardens' Apiary. Exhibits were shown at two exhibitions. The Botanical Gardens' Apiary was maintained and a total of 151 queens produced. 109 were sold or distributed as queens and 40 with nuclei of bees. Nine nuclei were given free to schools.

AGRICULTURAL DEMONSTRATION STATIONS

279. Agricultural Demonstration stations played an important part in educating farmers and furthering the extension programme. As the name implies, the function of such stations was primarily to demonstrate correct methods in agriculture and to introduce to farmers new varieties of crops, grasses and legumes as well as imported breeds of livestock; but in so doing, the stations also served to supply planting material of various kinds and agricultural requisites, as well as providing a common meeting place for farmers and extension officers where mutual problems could be discussed.

280. Berbice maintained three stations, one at No. 63 for the propagation of budded citrus plants, one at Providence for the propagation of clonal cacao plants, and one at Whim for the demonstration of vegetable growing, grasses, legumes and livestock.

281. Planting material distributed from these stations included 3,469 packets and 108 lbs. of vegetable seed, 294 vegetable seedlings, 2,787 citrus plants and 11,233 cacao plants. The livestock kept at Whim included dairy cattle, pigs, goats and poultry.

282. Demerara operated only one station at Atkinson Field where the main activities were the propagation of cacao and citrus plants. 18,552 cacao plants and 11,283 citrus plants were distributed from this station.

283. Essequibo maintained four stations, one at Bartica for the demonstration of citrus growing and livestock management, one at Suddie for citrus propagation, one at Maria's Lodge for citrus propagation and vegetable growing, and one at Charity for production of coffee seedlings.

284. Planting material distributed from these stations included 2,714 citrus plants and 560 coffee seedlings. The vegetable plot at Maria's Lodge produced 1,705 lb. of vegetables which were sold to the Suddie Public Hospital. The Livestock section of Bartica, which carried four dairy cows,

was closed down at year end.

285. North West District maintained a large station at Hosororo. This station was in the process of re-organisation, its demonstrations and experiments being directed towards greater diversification of agriculture in the area. Demonstration plots of citrus, cacao, coffee, avocado pear, coconut, vegetables and grasses were maintained. A new 4-acre plot of cacao was planted to demonstrate production under natural shade. The new section of avocado pear made good progress and an additional acre of new land was cut and burnt for planting. Five acres of Valencia orange were planted out as a demonstration plot. Bad drainage adversely affected the plot of Liberican coffee on the worn out pegasse.

286. The hill plot of local and St. Lucia dwarf coconuts showed very marked response to heavy applications of potash fertiliser. Ginger showed better results on the hill than on the swamp. Black eye peas were grown for demonstration as a cover and cash crop under citrus and pears. Locuntu grass gave a most impressive demonstration on the swamp and satisfied farmers with its ability to spread and keep down weeds. Small demonstration plots of Nadi Blue, Pangola and Coastal Bermuda grasses were grown. New crops of cauliflower, carrots and onions proved successful.

287. Planting material issued from the station included 1,311 citrus plants, 42 avocado pear plants, 18 dwarf and 300 local coconut seedlings, 934 cacao plants, 285 packets of vegetable seed, 27 lb. Black eye peas and 303 lb. ginger.

288. Livestock maintained for trial and demonstration included dairy cattle, sheep and poultry and accommodation was being provided for pigs. Sheep proved to be unsuccessful on account of scabetic mange and the flock was sold. A donkey was also kept to demonstrate its usefulness as a pack animal under the hilly conditions of the district.

289. A demonstration station was planned for the Moruca area and a start was made towards its establishment at year end. Three acres of land were felled preparatory to clearing and planting to coconuts.

NATIONAL EMERGENCY - DROUGHT

290. Drought in 1958 for the second year in succession caused a national emergency. As in 1957, drought committees were set up in the districts, guided by a central committee in Georgetown, headed by the Director of Agriculture. Funds were provided by Government to assist farmers to recover pumping costs incurred with the autumn rice crop. Extension officers worked tirelessly visiting farm lands, allocating priorities for pumping and ensuring that all resources of equipment and fuel were made available on time. It is gratifying to record that few ill effects were suffered by farmers from the drought but that on the contrary, bumper production was obtained.

ACHIEVEMENTS IN EXTENSION WORK

291. The evaluation of an extension programme is a most important necessity in assessing what impact is being made on the farming community by the dissemination of advanced agricultural methods. Some of this impact is hardly visible, it can only be sensed by a general awareness in the community and an increasing demand for more services, improved crop plants and improved livestock breeds. Progress may be slow and indefinable but over a period of time an extension staff will experience this increasing demand for its time, advice and assistance in

obtaining farmers' requirements for advancement.

292. During 1958 apart from the national drought emergency (regarded as abnormal in this wet country), field officers devoted a great deal of their time to meetings, interviews, demonstrations, field days, exhibitions, etc., all of which have already been mentioned and outlined above. A large gap still remained to be covered in meeting farmers' demands for plants and livestock, nurseries and breeding centres being unable to produce enough material to meet the demand. This unsatisfied demand was, nevertheless, regarded as a healthy sign of farmers' growing knowledge of the value of improved pedigree material. Private enterprise may in the future fill this gap, which Government cannot by reason of its limited resources.

293. The visible achievements in extension work were, however, easier to record. In general, 1958 was a year of record production. The largest crops ever of rice, corn and ground provisions were produced, the Colony not only became self-sufficient in beef and poultry but was able to export surplus beef. Milk was supplied to the Pasteurisation Plant in such quantity that difficulty was experienced in selling the pasteurised product.

294. Farmers adopted better techniques in every field. A few are listed below:-

(a) Increased use of fertilisers;

(b) Better management of Orchards;

(c) Increased use of insecticides and fungicides for the control of pests and diseases;

(d) Establishment of fodder plots;

(e) Improved livestock housing;

(f) Poultry vaccination;

(g) Deep litter poultry pens;

(h) Use of minerals in cattle feeding;

(i) Early weaning of pigs;

(j) Increased use of pedigreed stock;

(k) Increased use of concentrate feeds.

295. A few agricultural industries deserve special mention for progress recorded in 1958:-

(a) Rice - A record 155,000 acres were grown producing a record crop of 102,000 tons. Farmers responded to the extension efforts in early planting, use of fertilisers, use of pure line seed and better water control;

(b) Poultry - Achieved the status of being the best established livestock industry in the Colony. The best farms were to be found in the East Bank, Demerara District, where .

large scale poultry rearing was organised on a most efficient basis. Improved management and disease control were practised widely. Field Officers encouraged the distribution of chicks from private hatcheries;

(c) Milk - The campaign for greater production and higher hygienic standards resulted in a record delivery of 485,650 gallons of milk to the Pasteurisation Plant;

(d) Corn & Ground Provisions - Extension efforts among growers of these crops to take advantage of the favourable dry season to bring in new land, to improve their drainage and fencing, met with well-deserved success. Plantains and Cassava glutted the market, as a result of which Plantains had to be exported direct from the production areas to Trinidad while a Colony-wide distribution of both had to be made at uneconomic cost. Surplus corn was also exported to Trinidad.

DEVELOPMENT SCHEMES

Staff Training

296. Three cadets and one Prison Officer completed a 2-year course at the Eastern Caribbean Farm Institute in July. Eight students were sent in October to commence a 2-year course.

CACAO DEVELOPMENT SCHEME

297. Colonial Development and Welfare assistance was approved up to the end of the year on the basis of 50% contribution. The propagation centres at Atkinson Field (Demerara), Providence (Berbice), Hosororo (North West District, Belle Alliance (Essequibo), and in the Botanic Gardens continued to operate.

Atkinson Field

298. 39,000 cuttings were propagated, 30,144 plants basketed, 15,095 distributed and at year end there were 38,696 plants on the hardening floor.

Botanic Gardens

299. This unit served an important role in supplying plants for the out-stations establishing their own nurseries. 4,460 cuttings were propagated, 4,400 plants basketed, 3,454 plants distributed, and at year end there were 5,104 plants on the hardening floor.

Essequibo

300. 3,290 cuttings were propagated, 4,153 plants basketed (includes 1,650 from Georgetown) and 1,369 were supplied to the nurseries.

Hosororo

301. 8,400 cuttings were propagated, 5,631 plants basketed, 934 plants distributed and 2,496 planted on Station's land.

Providence

302. 20,844 cuttings of cacao were propagated and 11,233 plants distributed.

MARKETING DIVISION

303. The general policy of the Division was to encourage local agricultural production by offering the farmer, dairyman and fisherman an assured market at economic prices. It organised the sale and distribution of produce in the coastal area and sells feeds, fertilisers, etc., to farmers at the main depots. The Division processes agricultural products at its processing plant for feeds, the Ham and Bacon Factory and the Milk Control and Pasteurisation Plant. A cold storage plant is operated for the storage of fish, ham and bacon.

304. The organisation is under a General Manager with sectional managers under him. It is self accounting and Government provides the working capital. Deficits on the trading results are voted in the Colony's Recurrent Budget.

305. The trading results of the Marketing Schemes were as follows:-

	Operating Expenses	Gross Profit	Gross Loss	Nett Deficit
Government Produce Depots including Ham & Bacon Factory and Processing Factory	272,656.31		66,331.21	338,987.52
Fish Marketing Centre	122,669.92	64,842.71		57,827.21
Milk Control and Pasteurisation Plant	126,718.80		36,442.03	163,160.83

306. The total value of purchases and sales were as follows:-

	Purchases	Sales
	$	$
Government Produce Depots including Ham & Bacon Plant and Processing Factory	958,184.28	691,401.41
Fish Marketing Centre		
Fish	291,353.67	317,924.35
Gasolene & Oil	17,773.20	20,066.94
Milk Control & Pasteurisation Plant	358,385.99	415,216.89
Total	$1,625,697.14	1,444,609.59

307. The reasons for this unsatisfactory situation were:-

(1) The unprecedented glut of cassava and plantains which the produce depots had guaranteed to purchase at fixed prices and could not completely resell;

(2) The impossibility of selling all the milk purchased by the Milk Pasteurisation Plant and the operation of the Plant below

its economic output;

(3) The operation of the Processing Factory below its economic output;

(4) The inadequacy of the cold storage plant to cut down losses on the wholesale fish market;

(5) The generally high overheads required to run an organisation of this nature on commercial lines.

308. It must be accepted that the financial losses of the Division represent in the main a subsidy to the farmer who would otherwise have failed to find a market for his produce. It would be better if subsidies of this nature were made as direct grants rather than let them be reflected as losses in the accounts of the Organisations. There is little doubt that the chances of success of the various branches of the Marketing Division have been reduced by the operation of disguised subsidies in this manner.

GOVERNMENT PRODUCE DEPOTS

309. The main depot is in Georgetown with other full time depots at New Amsterdam and Springlands (Berbice). This latter centre was opened experimentally and subsequently closed during the year Other centres for the purchase of farmers' produce are at Charity and Diamond (Pomeroon), and Parika (West Demerara). Purchasing in the North West District was carried out by the Farmers' Co-operative Society. Marketing Assistants visit the purchasing centres on specified days usually when the Government steamer is due to make a call but sailing vessels are also used for the transport of produce.

310. Supplies of root crop provisions were well maintained but there was a serious glut of Sweet Cassava and Plantains as the figures of purchases compared with 1957 will show. It was not possible to sell the full quantity purchased at the guaranteed prices of 3¢ per lb. for Plantains and 2½¢ per lb. for Sweet Cassava. Direct shipment of Plantains to Trinidad by schooner from the Pomeroon and the processing of Plantain flour and distribution by lorry in the country areas assisted the situation but considerable spoilage was unavoidable as the depot has not got the space or staff to deal with such large quantities.

311. The glut of cassava was an even greater problem because of its very limited keeping qualities. Export was impracticable and the processing into starch proved highly uneconomical. The manufacture of a stock feed by grinding and drying the root was also uneconomic but it is possible to incorporate it into locally mixed livestock rations. It has proved difficult to sell much of the starch which was discoloured.

312. The following is a breakdown of the purchases of Ground Provisions in 1958 as compared with 1957:-

	1957 (lbs.)	1958 (lbs.)
Plantains	280,394	5,487,324
Cassava	9,050	5,208,705
Sweet Potato	33,326	83,290
Yams	21,547	25,855
Tannias	6,485	4,642
Eddoes	140,300	136,715
Total	491,300	10,946,531

Coffee & Cacao

313. 51,976 lbs. of coffee and 3,999 lbs. of cacao were purchased during the year. The quality of cacao was poor owing to unsatisfactory fermentation and drying. There was an improvement in the quality of coffee offered from the Pomeroon and North West District. During the latter part of the year an arrangement was made with the Pomeroon Farmers' Co-operative Society for the Marketing Division to act as an export clearing house.

Fruit

314. Supplies of bananas were well maintained and there was improvement on the previous year. Citrus fruit were disappointing in quantity and quality:-

	1957	1958
Bananas	12,675	49,552
Oranges	51,884	51,467
Grapefruit	18,374	15,748

Livestock Feeds, Veterinary Supplies, Insecticides and Fertilisers

315. Sale of these commodities by the depot, and also through the District Agricultural Superintendents and Instructors acting as distributing agents for the Government Produce Depot, continues to provide a valuable service to farmers generally and more particularly so to those in remote areas.

PROCESSING FACTORY

316. The successful operation of the Factory was again handicapped by the shortage of low priced ingredients particularly stock-feed, rice and copra meal. The prices of imported feeds were competitive and have taken a good deal of the trade. A full range of rations are manufactured for poultry, pigs, cattle, horses, etc. Sales were 959,225 lbs. as compared with 1,488,164 in 1957.

Corn

317. Purchases totalled 1,188,458 lbs. at the guaranteed price of 4½¢ per lb. at the Processing Factory. The corn purchased usually has to be dried and this together with handling charges brings the finished cost price to 5¾¢ per lb. The supply exceeded local requirements and the best export price that could be obtained was 6¢ per lb. c.i.f. Shipping charges, etc., averaged 1½¢ per lb., and it is calculated that the total loss arising from the export of this commodity was $7,118.00. The demand for locally manufactured corn meal increased slightly and 93,063 lbs. were sold.

MILK PASTEURISATION PLANT

318. The Milk Pasteurisation Plant operated throughout the year. Purchases during the four quarters of the year were as follows:-

First Quarter	113,713 glns.	cost $ 83,130.09	(Average	
Second "	146,004 "	cost $109,492.91	(cost per	
Third "	127,797 "	cost $ 95,961.25	(gallon	
Fourth "	91,932 "	cost $ 69,801.74	(74.7¢	
Total	479,446 glns.	cost $358,385.99		

319. A comparison of the cost of production for the four quarters of the year is as follows:-

	Raw Milk	Per-centage	Production Expenses	Per-centage
1st Quarter	$ 73,401.54	78%	$ 20,684.10	21%
2nd "	87,077.98	79%	22,878.59	21%
3rd "	77,931.88	78%	21,467.05	22%
	(Including R.C. Product costing $785.66)			
4th "	75,432.94	80%	18,868.42	20%
Total	$313,844.34	79%	$83,898.16	21%

N.B: R.C. = Recombined Milk.

320. The following is a comparison of the cost of milk pasteurised for the four quarters of the year:-

1st Quarter	96,539 glns.	cost	$ 94,085.64	(Average
2nd "	113,918 "	"	109,956.57	(cost
3rd "	103,289 "	"	99,398.93	(per gln.
4th "	86,197 "	"	94,301.36	(99.4¢
Total	399,943 glns.	cost	$397,742.50	

321. A comparison of sales for the four quarters of the year is as follows:-

	Pasteur-ised milk Pints	Value $	Raw Milk Glns.	Value
1st Quarter	706,659	93,288.82	4,408	3,857.20
2nd "	785,465	101,520.39	5, 13	4,527.30
3rd "	783,694	101,679.98	5,124	3,594.70
4th "	777,408½	103,070.10	5,242	3,678.40
Total	3,053,226½	399,559.29	19,887	15,657.60

322. Fresh Cream 48% Butter Fat was made available to the local market between July and September in four-ounce packets. The sales amounted to 57 gallons valued at $723.58. This was most encouraging but it was felt that the price was too high for the average person. The skimmed milk was sold to the Livestock Farm for animal feeding only.

323. Only 17,000 gallons of Recombined Milk were made during 1958 as compared with 73,176 for 1957. The critical period was October and November.

324. Prices paid to the farmer for milk and retail prices are given on page 9 of this Report.

325. The net loss of $163,161 incurred in running the Plant is accounted for by free distribution of unsold milk and the sale of milk to Schools at half price ($74,838.29). Also the Plant was only operating at just over half of its economic capacity.

326. Three local Bakeries in tituted a house-to-house delivery in Georgetown and there s also a delivery service in Mackenzie. As stated p viously the public is only taking to Pasteurised Milk s owly.

HAM & BACON FACTORY

327. The Plant continued to operate for the benefit

of the Pig Industry while at the same time supplying the greater part of local requirements of bacon at favourable consumer prices. A total of 2,134 pigs weighing 196,738 lbs., was purchased for $86,689.20 an average price of 44¢ per lb. carcase weight.

328. A comparison of Finished Products production for 1957 and 1958 is given hereunder:-

	1957	1958
Ham	9,026 lbs.	5,917 lbs.
Bacon	48,342 "	44,808 "
Sausages	8,500 "	9,139 "
Lard	7,568 "	7,324 "

329. Exports of frozen pork show a sharp decline and are negligible by comparison with the 1957 figure. Only 9,679 lbs. were exported as against 80,968 lbs. in 1957. Competition from New Zealand suppliers and the undependable size and quality of the local carcases were the main reasons for the loss of this market.

FISH MARKETING CENTRE

330. Functions of the Centre other than the wholesale purchase and selling of fish are the storage of fish for vendors, the sale of ice (in blocks or crushed) to fishermen at $1.70 per block and the running of a dormitory for the use of which a small nominal charge is collected from members of the fishing industry.

331. The Fish Market handled 945,920 lbs. of fish valued at $286,034.76. The main types were Snapper, Croakers, Sea Trout, Grouper, Queriman, Sea Patwa and Bangamaree. Of the above total the research trawler "Cape St. Mary" contributed 356,705 lbs. valued at $44,030.07.

332. The over-all volume disposed of represents an increase of approximately 460,000 lbs. over the previous year. The impending withdrawal of the vessel "Cape St. Mary" during the coming year is viewed with much concern as the loss in trade is bound to reflect adversely on the finances of the Centre.

BOTANIC GARDENS

333. The Gardens were maintained in good condition and a particular effort was made for the visit of Princess Margaret when there was a fine display of Dahlias, Marigolds, Zinnias and Coleus.

334. Many beds were rehabilitated during the year and Bougainvillias of many types were very colourful in the latter part of the year. New water mains were laid and two new shelters constructed.

335. A total of 9,956 fruit trees, mainly Oranges, were sold to the public while 8,023 Ornamentals were distributed or sold.

ECONOMICS DIVISION

336. The Agricultural Economist was on leave and later in the year transferred to Nigeria. The work of the Division was curtailed on this account.

Agricultural Census: The Office Staff continued work on the extraction and interpretation of the 1956 Agricultural census.

Agricultural Statistics of British Guiana: All available information on Agricultural Statistics were collected and assembled into one volume. It is hoped to publish at a later date.

SECTION III

BOARDS AND COMMITTEES

The Director of Agriculture served as Chairman of the following Boards and Committees:-

(1) Sugar Industry Price Stabilisation and Rehabilitation Funds Committee;

(2) Berbice Fibre Research Committee;

(3) Sugar Experiment Stations' Committee.

The Director also served as a member of the following Committees:-

(1) British Guiana Rice Marketing Board;

(2) British Guiana Rice Marketing Board - Executive Committee;

(3) Selection Committee for Imperial College of Tropical Agriculture Scholars;

(4) Davson Memorial Fund Committee;

(5) Scholarship Selection Committee;

(6) Museum Committee (Board of Trustees for the Georgetown Cultural Centre);

(7) Development Programme Technical Co-ordination Committee;

(8) Industrial Development Advisory Committee;

(9) Fisheries Advisory Committee;

(10) Regional Development Committee;

(11) Rice Committee.

He served as Director o the British Guiana Rice Development Committee and of the Royal Agricultural and Commercial Society.

During the year visits were made by the Deputy Director of Agriculture, Mr. R.O. Williams to Suriname and by Mr. O.F. Churaman, Agricultural Superintendent, Head Office to Trinidad.

SENIOR STAFF CHANGES

The following changes of staff occurred during 1958:-

APPOINTMENTS

Mr. A.S. Mittelholzer, Rice Agronomist
Mr. V.P. Chung, Agricultural Superintendent
Mr. B.W. Carter, Assistant Agricultural Superintendent
Mr. C.K. Roberts, Assistant Agricultural Superintendent
Mr. H.N. Ramdin, Senior Technical Assistant
Mr. A. McGregor, Farm Manager
Mr. E.J.A. Khan, Soil Surveyor

PROMOTIONS

Mr. G.B. Kennard, Director of Agriculture
Mr. R.O. Williams, Deputy Director of Agriculture.

Mr. H. Paul, Assistant Director of Agriculture, (Research)
Mr. J.E. Isaacs, Senior Technical Assistant

TRANSFERS

Mr. A.F. Mackenzie, Federal Agricultural Adviser.

RETIREMENTS

Mr. G.L. Leitch, Grade I Agricultural Instructor

LEAVE

Mr. J.A. B. Pires, Plant Pathologist (Pre-resignation)
Mr. G.E. Wolstenholme, Curator
Mr. M.A. Dundas, Technical Assistant
Mr. H.L. Stewart, Technical Assistant
Mr. G.D. Paine, Veterinary Officer
Mr. E.I. Hugh, Livestock Officer
Mr. P.A. Chan Choong, Assistant Director of Agriculture (Extension)
Mr. A.V. Wan Ping, Agricultural Superintendent
Mr. P. Poonai, Agricultural Superintendent
Mr. W.A. Bovell, Agricultural Instructor
Mr. C.G.M. Shaw, Agricultural Instructor
Mr. J.L. Kidney, Agricultural Instructor
Mr. G.O. Davis-Isaacs, Agricultural Instructor
Mr. E.S. Douglas, Executive Officer
Mr. E.A. Holder, Class I Clerk
Mr. D. Singh, Class I Clerk
Mr. W.A. McArthur, Class I Clerk
Mr. H. Hill, Soil Surveyor
Mr. J. Stark, Soil Surveyor
Mr. E. Cundiff, Agricultural Officer
Mr. E.G. Taharally, Class II Clerk
Miss A. Douglas, Secretary

OFFICIAL VISITORS - 1958

Official visitors from overseas for the year were as follows:-

Dr. Bento Dantas, San Juan, Puerto Rico
Dr. Westermann, Amsterdam, Holland
Mr. Walker, Junior Geneticist, T.W.I. Central Sugar Cane Breeding Station, Barbados, T.W.I.
Mr. D. Rhind, Secretary for Agricultural Research, Colonial Office
Mr. Kamaludhin Mohamed, Hon. Minister of Agriculture, Lands & Fisheries, Trinidad, T.W.I
Mr. W.A. King-Webster, Fishery Officer, Trinidad
Mr. G.N. Gould, President of R.C.V.S.
Mr. A. Kohl, Vice-President, Soybean Council of America
Mr. V.H. Hongen, U.S. Department of Agriculture
Mr. Theo Hills, Professor (McGill University)
Mr. C. Grey, Member of Parliament
Mr. R.L. Mawley, Member of Parliament
Mr. Colmet-Daage, Agricultural Engineer, French Guiana
Mr. Sordoillet, Engineering Expert, French Guiana
Mr. R.S. Marshall, Adviser on Animal Health, Colonial Office
Dr. H.W. Lissman, Zoological Laboratory, Cambridge

Sir George Seel, K.C.M.G., Senior Crown Agent
Dr. J. Van Tilburg, Governor of Surinam
Dr. Galley, Colonial Microbiological Research Institute
Mr. M.H. Breese, Entomologist, Regional Research Centre
Dr. J. Waterlow, University College of the West Indies
Students from the University College of the West Indies.

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SECTION IV

L E G I S L A T I O N

Summary Of Legislation Affecting Agriculture Enacted During 1958

Ordinances	Purposes
Nil	
Regulations	
No. 5 - Regulation under the Plant Protection Ordinance.	To provide for the conditions of Importation of Plants.
Orders-In-Council	
No. 1 - The Animals Diseases (Paralytic Rabies) Order 1958	To declare a section of West Demerara an area infected with Paralytic Rabies.
No. 2 - The Animals Diseases (Importation) (Special Provisions) Order, 1958	To provide for the landing of horses in the Colony owing to the suspected presence of mange on the Steam ip "Speaker".
No. 8 - The Animals Diseases (Conditions of Importation of Poultry) Order 1958	To provide for the importation of poultry from certain countries only.
No. 9 - The Animals Diseases (Conditions of Importation of Birds) Order 1958.	To provide for a certificate of health to be supplied with the importation of birds.
No. 11 - The Plant Protection (Conditions of exportation) Order 1958.	To provide for the inspection of plants before exportation.
No. 15 - The Animals Diseases (Salmonellosis) Order 1958.	To declare certain areas infected with Salmonellosis.
No. 16 - The Animals Diseases (Prohibition of Importation of Poultry) Order 1958.	To restrict the importation of Poultry from Florida or through Florida.
No. 19 - The Animals Diseases (Paralytic Rabies) Order 1958.	To revoke Order-In-Council No. 1 of 1958.
No. 26 - The Rice Farmers (Security of Tenure) (Variation of Basic Rent) Order 1958.	To vary for one year from 1/5/58 the First Schedule to the Rice Farmers (Security of Tenure) Ordinance, 1956.
No. 28 - The Animals Diseases (Paralytic Rabies)(Equine Encephalomyelitis) Order 1958.	To declare a section of the Corentyne an area infected with Paralytic Rabies.
No. 29 - The Animals Diseases (Salmonellosis) Order 1958.	To revoke Order-In-Council Nos. 15 and 16 of 1958.

No. 34 - The Animals Diseases (Paralytic Rabies) Order 1958.	To declare a section of the Essequibo an area infected with Paralytic Rabies.
No. 42 - The Animals Diseases (Paralytic Rabies) Order 1958.	To declare the Essequibo Islands an area infected with Paralytic Rabies.
No. 48 - The Plant Protection (Notifiable Pests)(Coconut Moth Borer) Order 1958.	To declare Castnia Daedalus Cram., a notifiable pest.
No. 53 - The Animals Diseases (Conditions of Importation of Poultry)(Amendment) Order 1958.	To revoke Article 4 of Order-In-Council No. 8 of 1958 and substitute a new paragraph 4.
No. 59 - The Plant Diseases (Blast) Order 1958.	To declare a section of East Bank Demerara and East Bank Berbice areas infected with Blast (Piricularia Oryzae).
No. 61 - The Animals Diseases (Paralytic Rabies) Order 1958.	To revoke Orders-In-Council Nos. 34 and 42 of 1958.
No. 75 - The Animals Diseases (Paralytic Rabies) (Equine Encephalomyelitis) Order 1958.	To revoke Order-In-Council No. 28 of 1958.

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APPENDIX

Senior Staff Of The Department As At 31st December, 1958.

Director of Agriculture	- G.B. Kennard, D.I.C.T.A., A.I.C.T.A.
Deputy Director of Agriculture	- R.O. Williams, D.I.C.T.A., A.I.C.T.A.

RESEARCH & LABORATORIES

Assistant Director (Research)	- H. Paul, Ph.D., B.Sc. (Lond.), M.Sc. (McGill), D.I.C.(Lond.) F.R.I.C.
Entomologist	- C.P. Kennard, D.I.C.T.A., M.Sc. (McGill), B.Sc. (McGill)
Economic Botanist	- R. Yates, B.Sc., M.Sc. (Wales)
Agricultural Superintendent (Perennial Crops)	- P. Poonai, D.I.C.T.A, A.I.C.T.A.
Agricultural Superintendent (Annual Crops)	- A.S. Mittelholzer, Ph.D (McGill)
Plant Pathologist	- Vacant
Padi Pest Research Officer	- L.D. Cleare, F.R.E.S.
Agricultural Economist	- Vacant
Sugar Agronomist	- L.S. Birkett, D.I.C.T.A., A.I.C.T.A.
Soil Scientist	J.H.L. Messing, B.Sc. (Wales)
Chemist	- N. Ahmad, D.I.C.T.A., A.I.C.T.A., M.Sc., (Br. Columbia), Ph.D (Nott.)
Chemist	- Vacant
Agricultural Engineer	- D.I. Allen, N.D. (Eng.)
Research Officer (Ebini)	- S.P. Legg, B.Sc.
Agricultural Officer (Hosororo Station)	- D.E. Gollifer, B.Sc. Agric.
Agricultural Officer (St. Ignatius Station)	- E. Cundiff, B.Sc.
Fishery Officer (Inland)	- W.H.L. Allsopp, M.Sc. (Wisc.)
Fishery Officer (Marine)	- E.A. Shepherd
Curator	- G.E. Wolstenholme
Soil Surveyor	- E.J.A. Khan, M.Sc. (Edin.)

VETERINARY AND ANIMAL HUSBANDRY

Assistant Director (Veterinary)	- J.M. Fletcher, M.R.C.V.S.
Veterinary Officer	- G.D. Paine, M.R.C.V.S. (Lond.)
do.	- E.M. McWatt, D.V.M. (Ont.)
do.	- P.F. Byrne, M.R.C.V.S. (Dublin)
do.	- C.E.O. Fraser, B.Vsc., M.R.C.V.S.
do.	- Vacant
Farm Manager, St. Ignatius Station	- Vacant
Farm Manager, Central Agricultural Station	- C.A. Bannister, Dip. of Agric.

Farm Manager, Ebini Station	- A. McGregor (Ag.)
Senior Technical Assistant	- C.A. Veerasammy

AGRICULTURAL EXTENSION

Assistant Director (Extension)	- P.A. Chan Choong, B.Sc. (Hon.) (Lond.), A.I.C.T.A.
Superintendent, Rural Youth Work	- O.F. Churaman, D.I.C.T.A.
Agricultural Officer, Berbice	- H. Madramootoo, B.S.A. (Br. Columbia)
Agricultural Officer, East Demerara	- B.C. Ho-Yen, M.Sc. (McGill) B.Sc., D.I.C.T.A.
Agricultural Officer (Land Settlement & Development)	- E. . Hugh, M.Sc. (Iowa), B. c. Agric. (McGill), D. .C.T.A., Dip. of Agric.
Agricultural Officer (seconded) B.G. Rice Development Company	- E. . Giglioli, B.Sc. (Agric.) (M Gill)
Agricultural Officer	- V. . Chung
do.	- Vacant
Assistant Agricultural Officer	- H. . Cole
do.	- L.H. Hope
do.	CK. Roberts
do.	- B. . Carter
do.	- C.A. Vieira
do.	- M. Ramnarine, Dip. (Wye Agric. College)

MARKETING DIVISION

General Manager	- C.I.V. Mittelholzer
Chief Accountant	- G.F. Chan
Marketing Officer	- L.F. Paul
Manager, Government Produce Depot	- Vacant
Dairy Manager	J.E. Riley
Secretary/Accountant, Milk Marketing Organisation	- D. Seeram
Captain, "M.V. Cape St. Mary"	- W.G. Mitchell
Chief Officer, "M.V. Cape St. Mary"	- E.O.M. Lewis
Chief Engineer, "M.V. Cape St. Mary"	- W.F. Bird

SENIOR ADMINISTRATIVE STAFF

Executive Officer	E.E.S. Douglas
Accountant	- K. Rohoman
Senior Woman Secretary	- Miss M. Cheong

OFFICERS WORKING ON COLONIAL DEVELOPMENT & SCHEMES

Soil Surveyor	- J. Stark, B.Sc.
do.	- H. ill