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THE CEREAL INDUSTRY OF JAMAICA: SCOPE AND PROGRAMMES

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Introduction

The cereal industry of Jamaica is confined to corn and rice, though sorghum could be of some importance in the future. The paper will therefore be concerned primarily with corn and rice, but includes a very brief examination of the prospects of sorghum.

Jamaica imports the majority of its cereals (cereals when used throughout this paper refers to corn, rice or sorghum, unless otherwise specified). This may be partly explained by the physical resources of the island and by the historical evolution of the cropping pattern.

Physical Resources

Jamaica has a total land area of approximately 4,242 square miles or 2,715,000 acres, with many rivers. The dominant feature of the landscape is a very rugged terrain. About 50 per cent of the land area has an elevation of 1,000 feet, and about 40 square miles has an elevation of over 5,000 feet. Only about 20 per cent of the land area is flat or gently rolling. Only in the latter area can any serious consideration be given to cereal production.

Agriculture occupies approximately 1.5 million acres or about 55 per cent of the total land area. Table 1 shows land use distribution in Jamaica.

Table 1. Land Use Distribution in Jamaica, 1970

Land Use	Acres	Present
Forest (including forest plantation)	655,000	24.1
Other woodland (including scrub forest)	538,000	19.8
Agriculture (including improved pasture)	1,258,000	46.4
Natural range and grassland	103,000	3.8
Swamp	50,000	1.8
Mining	7,000	0.3
Urban	100,000	3.7
Barren	4,000	0.1
Total	2,715,000	100.0

Source: National Physical Plan for Jamaica, 1970.

A detailed breakdown of the land use within the acreage occupied by agriculture is given in Table 2. The principal types of agricultural usage are plantation crops grown mostly for export, mixed farming of food crops for domestic consumption and pasture for beef and dairy cattle, whose products also are consumed locally.

Table 2. Distribution of Land in Farms by Major Types of Use

Types of Use	Acreage	% of Total
Sugarcane	167,700	11.2
Bananas	84,000	5.6
Coconuts	100,000	6.7
Citrus	25,000	1.7
Cocoa	27,000	1.8
Coffee	15,000	1.0
Pimento	24,000	1.6
Tobacco	1,900	0.6
Other tree crops	1,000	0.1
Domestic food crops	91,000	6.1
Commercial forests	16,000	1.1
Improved pasture	250,000	16.7
Natural range and grassland	138,400	9.2
Other lands suitable for agriculture	139,000	9.3
Remainder*	420,000	28.0
Total	1,500,000	100.0

Note: *Remainder includes forest, woodland, swamps etc.

Source: *Jamaica's Second Five-Year Plan, 1970-1975*, Vol. III, Central Planning Unit, unpublished.

The major export crop, sugar, occupies most of the alluvial coastal plains and interior valleys to the extent of approximately 168,000 acres. Banana, the second most important export crop occupies some 84,000 acres, (though not all in pure stand) throughout the country. Citrus occupying some 25,000 acres is somewhat concentrated in the south-central part of the country. The majority of the domestic food crops occupy the hilly regions of the country.

It may be worthwhile to note that only 6.1 per cent of the land is being used for domestic food production. This is definitely too small, but this is partly due to the historical export-oriented agriculture of Jamaica.

Climate

Jamaica enjoys an annual average rainfall of 77.1 inches, however, there is a wide disparity between the lower and upper ranges. The rainfall is strongly influenced by the terrain, consequently, the northeast or windward side of the island receives high rainfall, reaching over 200 inches per annum on the upper exposed slopes of the Blue Mountains. The southern coastal lowlands are in the rainshadow and receive less than 50 inches of annual rainfall.

The Rice Industry

In 1973 Jamaica produced less than one per cent of the rice it consumed, as compared to 1962 when it produced 10.8 per cent. In 1957 local production was over 35 per cent of total consumption. This deteriorating position of local rice production to total rice consumption has occurred not only in relative terms but also in absolute terms. This situation has occurred because of several factors. Jamaica's rice industry was not in a position to be competitive with imported rice. In addition, very little was done to improve this position through better varieties, improved production technology and prices that could serve as an incentive to farmers.

Before going into any further discussion, it may be worthwhile to look at Table 3 which shows rice production and imports since 1960 so that some idea of the magnitudes of imports can be seen.

Table 3. Quantity of Rice Produced and Quantity and Value of Rice Imported in Jamaica, 1960 to 1973

Year	Production (s. tons)	Imports	
		Quantity (s. tons)	Value (J\$)
1960	n.a.	24,180	2,917,288
1961	1,630	20,531	2,623,670
1962	2,543	20,952	2,779,138
1963	2,416	24,872	3,435,130
1964	1,689	30 287	4,021,328
1965	986	36,962	4,990,728
1966	923	30,242	4,158,746
1967	812	36,740	5,646,500
1968	663	26,309	4,729,910
1969	865	29,357	5,817,830
1970	88*	37 305	6,886,626
1971	536	42,236	8,008,333
1972	196	40,746	9,006,698
1973	269	34,858	10,791,656

Note: *One-quarter production only.

As can be observed from the figures, Jamaica's imports of rice is considerable. It may be worthwhile noting that some 35 per cent of the 1973 imports were from outside the Caribbean region (the U.S.A. in particular). Rice may be regarded as a staple item of the Jamaican diet. This makes the country very vulnerable to be so dependent on imports. This was clearly shown in 1973 when there was a general world shortage of grains. The traditional suppliers, Guyana and U.S.A. were unable to deliver the quantities demanded as a result there had to be rationing of rice in supermarkets, which caused a certain amount of panic among consumers.

Scope and Programmes

Jamaica has a number of areas suitable for rice production. The major areas being the Upper Morass in St. Elizabeth, the Negril Morass and sections of the Caribretta River Basin in Westmoreland, and sections of the Plains of St. Catherine and Clarendon.

In 1973 proposals were made for the expansion of rice production. In October of 1973 a Japanese Exploratory Mission visited Jamaica in response to a request made to that Government by the O.A.S. on behalf of the Government of Jamaica in 1972. This Mission recommended that the Upper Morass should be the area where development should be focussed in the first instance.

In its preliminary report, the Mission indicated that the Japanese Government would be prepared to assist the project for development of intensive rice cultivation in the Upper Morass area by providing assistance as follows:

- (i) provision of experts in soils and fertilizers and in rice cultivation for 3-year terms of duty in Jamaica;
- (ii) provision of additional experts for short-terms as occasion demands; and
- (iii) provision of machinery and equipment for a 50-acre test farm in the Upper Morass area - including transplanters, threshers, small combines, pest control machines, weeding equipment and hand tools, dryers, and milling equipment.

Strategy of Development

Following the Japanese Mission for Technical Assistance, the Agricultural Development Corporation (A.D.C.) submitted to Government proposals for expansion of rice production. The main focus of development will be in the Upper Morass area of St. Elizabeth. Expansion has been initiated by A.D.C. concurrently with the establishment of a 50-acre rice experiment station to be developed with Japanese technical assistance.

The A.D.C. has extension staff to teach and assist farmers in the growing of rice, especially the CICA-4 variety. Already a number of farmers have shown keen interest. The A.D.C. is making its equipment available to assist farmers with land preparation, spraying, fertilizing and harvesting operations. The A.D.C. is purchasing combine harvesters and by 1975/76 should have purchased a total of eight harvesters. In addition, private growers intending to plant areas in excess of 200 acres are being encouraged to purchase their own combine harvesters.

Seed Requirement

The programme is based primarily on the use of CICA-4 variety, and a floating variety to a lesser extent. One of the major functions of the experimental station will be the production of varieties which can offer superior yields, resistant to disease and superior milling qualities.

So far CICA-4 has proved satisfactory in all aspects, giving yields of up to 7,000 pounds paddy per acre, and a medium sized grain which mills satisfactorily. Its greatest disadvantage is that it is not suited to production in swamps where the water level is likely to be greater than 18 inches and where water level control is not practicable. Under conditions of salinity greater than 700 p.p.m. yields are greatly reduced. Responsibility for seed production for farmers will be shared jointly between the A.D.C. and the Crop Research Department of the Ministry of Agriculture

Planting Programme 1974/75 to 1977/78

Acreage to be planted and tons expected from farmers and A.D.C. are shown in Table 4.

Table 4. Estimated Acreage Planted and Paddy Yields from A.D.C. and Farmers Rice Expansion

Time of Planting	A.D.C.		Farmers		Total Acres	Total Yield (s. tons)
	Acres	Yields (s. tons)	Acres	Yields (s. tons)		
Spring 1974	44	82.5	200	375	244	457.5
Fall 1974	1,076	2,017.5	620	1,162.5	1,696	3,180
Total	1,120	2,100	820	1,537.5	1,940	3,637.5
Spring 1975	1,482	2,778.75	900	1,687.5	2,382	4,466.25
Fall 1975	1,482	2,778.75	1,200	2,250	2,682	5,028.75
Total	2,964	5,557.50	2,100	3,937.5	5,064	9,495.0
Spring 1976	1,482	2,778.75	1,500	2,812.5	2,982	5,591.25
Fall 1976	1,482	2,778.75	1,800	3,375	3,282	6,153.75
Total	2,964	5,557.50	3,300	6,187.5	6,264	11,745
Spring 1977	1,482	2,778.75	2,000	3,750	3,482	6,528.75
Fall 1977	1,482	2,778.75	2,000	3,750	3,482	6,528.75
Total	2,964	5,557.50	4,000	7,500	6,964	13,057.5

Note: Paddy estimated to yield 60 per cent clean rice.

As can be seen from Table 4, paddy production is projected to be 13,050 short tons (the equivalent of 9,830 tons of rice) by 1977. It is envisaged that production should continue to increase to the early eighties when it would level off at about 15,000 tons of rice. This would make the island about 25 per cent self-sufficient.

Milling Capacity

The A.D.C.'s mill at Spanish Town has a capacity for processing 15,000 tons of paddy per annum (210 working days operating three shifts). The mill has never been used near capacity. Only in 1957 did the plant operate above 50 per cent of its capacity. The present plant has been undergoing repairs, and should be capable of coping with local production until 1966. If the rate of expansion proceeds as planned, and there are all indications that this will be achieved, then a new plant will have to come into operation in 1977.

The Corn Industry

Jamaica's corn industry like the rice industry is almost completely based on imports. In 1973 for example, Jamaica produced only 3.5 per cent of unmilled corn used in the economy to say nothing of imported corn products. The livestock industry is fairly well developed, particularly pigs and poultry, with the poultry industry producing some 47 million pounds of broiler meat and about 138 million eggs, and the pig industry producing about 15 million pounds of pork in the better years.

The pig and poultry industries are very dependent on corn, since corn is the major ingredient in their feed. This makes the industries very susceptible to price increases and availability of corn on the U.S. market. Table 5 shows the production and imports of corn between 1960 to 1974.

The production figures for 1974 shows a significant increase over the other figures in the series. This is due to the programme for increased corn production which will be discussed elsewhere in the paper. In order to fully comprehend the high dependence on imports, Tables 6 and 7 will have to be considered.

The production figures of Table 6 are derived primarily from imported corn, so these figures should be considered more from the value added concept rather than production initiated in Jamaica. Table 7 should be considered largely within the same context.

There is a close relationship between the considerable expansion in the imports of corn as shown in Table 5 and the increase in animal feed production as shown in Table 7. The import of corn is also strongly correlated with the expansion of the broiler and pig industries. As a result of the increase in local production of animal feeds, the quantities of feeds imported have been declining.

Scope and Programmes

As was shown in Table 2 the majority of Jamaica's agricultural land are presently under export-oriented, permanent or semi-permanent crops. The present strategy is to remove some of the marginal lands for

Table 5. Quantity of Corn Produced and Quantity and Value of Rice Imported in Jamaica, 1960-1974.

Year	Production (s. tons)	Imports	
		Quantity (s. tons)	Value (\$)
1960	n.a.	14,247	629,668
1961	n.a.	15,362	641,084
1962	n.a.	16,557	807,778
1963	4,345	18,486	945,826
1964	5,040	28,802	1,316,000
1965	3,920	25,392	1,173,492
1966	6,160	54,688	2,664,364
1967	4,926	51,546	2,247,856
1968	3,868	52,492	2,804,409
1969	5,112	63,966	3,396,166
1970	4,879	74,101	4,202,811
1971	5,758	126,044	5,690,135
1972	4,826	123,022	6,085,954
1973	4,375	120,750	10,260,388
1974	10,830	75,453*	9,358,160*

Note: * The 1974 import figures are from January to September only.

Table 6. Quantity of Cornmeal Produced and Quantity and Value of Cornmeal and Flour Imported, 1960-1973.

Year	Production (s. tons)	Imports	
		Quantity (s. tons)	Value (\$)
1960	7,598	2,383	135,486
1961	8,427	3,400	254,396
1962	8,069	4,419	318,406
1963	9,004	3,239	271,378
1964	9,517	5,232	441,302
1965	9,294	4,236	359,134
1966	10,358	2,847	250,398
1967	10,489	4,049	422,230
1968	10,326	5,614	702,968
1969	9,697	4,309	808,008
1970	9,314	4,625	587,250
1971	8,983	4,210	621,771
1972	9,889	4,014	616,185
1973	11,978	2,266	351,373

Table 7. Animal Feed Production, 1960-1973.

Year	Cattle feed	Pig feed	Poultry feed	Others	Total feeds
	(short tons)				
1960	6,924	3,277	1,484		11,685
1961	7,164	3,600	1,806	1,923	14,493
1962	2,556	2,551	343	8,142	13,592
1963	3,037	5,873	3,942	2,857	15,709
1964	2,820	2,837	7,747	2,159	15,563
1965	7,121	4,084	17,325	29	28,559
1966	8,974	6,453	22,988	278	38,693
1967	10,926	11,609	26,524	479	49,538
1968	12,959	8,161	24,750	10,235	56,105
1969	16,943	32,205	37,669	493	87,310
1970	16,521	35,913	49,120	401	101,955
1971	23,852	62,089	66,405	691	152,537
1972	28,852	83,931	63,439	817	177,086

some of these export crops like sugarcane and put them into domestic crops. It is even more important to bring the idle lands into production with emphasis on domestic crops.

If we consider the level of imports of unmilled corn alone, about 250 million pounds per annum are required. With the traditional yields of 16 bushels per acre for the island's average, cultivation of some 244,000 acres of corn would be necessary to make the island self-sufficient. For hybrid corn (pioneer seeds) which farmers now cultivate, the island's average yield is approaching 30 bushels per acre. On this basis, 130,000 acres of corn per annum would be required to make the country self-sufficient.

This magnitude of production would have to be done at the expense of sugarcane which is giving much better returns per acre than corn, and is also a better employer of labour which is of vital importance in Jamaica today. As a result of the economics of the situation, Jamaica cannot at the moment consider getting anywhere near self-sufficiency in corn.

Because the corn industry is considered so vital to the livestock industry, however, efforts are being made to improve the technology used in corn production, namely, hybrid and composite seeds, more fertilizers, better pest and weed control so as to lift production to about 50 to 60 bushels per acre - an average yield that is regularly obtained in better managed estates and farms.

In order to provide incentives for greater productivity, the Government is presently granting to farmers subsidies in the form of hybrid seeds, pesticides, weedicides, and a 33 $\frac{1}{3}$ per cent rebate on fertilizers.¹ This programme has resulted in the acreage in corn

¹The fertilizer subsidy is given on all crops, while the other subsidies are given on some legumes.

production increasing from 8,500 acres in 1973 to 12,500 in 1974. At the same time production has increased from 4,375 tons in 1973 to 10,830 tons in 1974. The increase in the yields per acre are rather significant. It is now proposed to plant about 35,000 acres per annum from which the expected output is about 33,600 tons.

Sorghum

Sorghum is a potential substitute for corn in animal feeds, and for use as a flocculent in the bauxite industry. The bauxite currently needs about 46,000 tons of starch.

For all practical purposes, Jamaica cannot be considered as having a sorghum industry. Sorghum has been grown in Jamaica over a long period of time, but only very small quantities are produced. A reluctance to growing sorghum is associated not only with low returns per acre but also to two major pests, namely, the sorghum midge and birds.

Although some breeding of sorghum was done by pioneer seeds in Jamaica, very little research information is available. It is necessary, therefore, for the Ministry of Agriculture to grow sorghum on a commercial field trial basis using plots of 5 to 10 acres in at least two different areas. This would assist in determining production cost and yields, and ultimately of the economic feasibility of producing this crop.

Conclusions

From the figures shown throughout the paper it can be seen that Jamaica's production of cereals has been very insignificant when compared to its demands. Cereals are of vital importance to the Jamaican economy, both for direct human consumption and for the livestock industry. Because cereals are so vital to the economy, efforts are being made to reduce the dependency on imports (ranging from 97 to 99 per cent over the last decade) to about 75 per cent of local demand. As production increases it may be possible for the programme to be more ambitious, since yields per acre may improve considerably with two possible consequences. Firstly, it should increase the quantity produced from a given acreage, and secondly, it should make the industry more lucrative which would tend to increase the acreage of these cereals.