RICE INDUSTRY — BRITISH GUIANA.

(These notes have been received from Mr. J. C. Lamrock, B.Sc. (Agr.), Agricultural Officer, who was selected for overseas post-graduate training at the Imperial College of Tropical Agriculture, Trinidad. Mr. Lamrock has selected as his special project, "The Effect of Various Cultivation Techniques on Representative Short Term Crops." He visited the Crown Colony of British Guiana as an external part of his course at the Imperial College).

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At present approximately 40,000 peasant farmers are engaged in the production of rice, farming approximately 90,000 acres by primitive methods. There is approximately one million acres of virgin land in the coastal area available for rice culture but due to the unit head productivity of the peasant and his present range of equipment the present area cannot expand though the land and market is available for extended increase for the industry. The increase will come about as soon as the industry can be mechanised. The main stumbling block to mechanisation is the lack of a rice variety suitable for mechanical harvesting.

The cultivation of rice in British Guiana began with the influx of East Indian labourers, who brought with them the rice seeds and varieties which make up the industry of today, under a system of indenture to sugar plantations. Whilst the majority of these workers, having completed their terms of indenture, continued in the employment of the sugar industry, many of them branched out on their own and commenced cultivating small areas of land under rice as their sole means of livelihood.

The peasant farmer individually is unable to process his rice due to the capital required for milling machinery and the time, etc., for finding the best market for his produce. Thus peasants sell their crops as unmilled rice generally. The marketing of rice in pre-1939 days was effected either through the millers, commercial concerns or private speculators.

The commercial community were not long in developing an export trade mainly within the British West Indies, and in 1938 some 34 such exporting agencies were in existence. With so many exporting agencies and with processing controlled by no less than 175 small and often poorly equipped private mills, it was very difficult to maintain uniformity in the quality of exports as each agent purchased rice from various areas in which the system of cultivation, the varieties and the milling differed.

Prior to 1939 rice from the Far East had a strong hold on the British West Indies market and the British Guiana export trade had to face a formidable competitor, especially in regard to price. Apart from this competition the local purchasing agents were continually under-selling each other in the West Indian market. Conditions, as a result, were almost chaotic and the hardships of the producers were increased by the uncertainty of the value of their produce from year to year.

When war was declared in 1939, the rice industry bore all the marks of lack of organisation, instability and uneconomic prices and Government wisely seized control under Defence Regulations in order to regularise the situation. One of the reasons for this action on the part of Government arose out of the experience during the 1914-1918 war, when speculators, in pursuit of immediate financial gain, ran the local market in short supply in order to export as much as they possibly could.

The regulations provided for the establishment of the British Guiana

Rice Marketing Board as a single-buying/single-selling organisation through which all rice produced in the Colony, save a specific quantity which each producer was allowed to retain for domestic consumption, was channelled for distribution on the local market and for export.

After the cessation of hostilities, Government, acting on a mandate given by representatives of rice producers, introduced legislature for the establishment of the Rice Marketing Board as a statutory body with powers similar to those granted under the Defence Regulations.

All paddy harvested throughout the coastland is normally disposed of in the following manner:

(a) Retained by the producer for seed.
(b) Sold to the stock feed market.
(c) Delivered to mills for milling into rice.

With respect to (b), the use of paddy in the animal industry is considered a proper use of this product and the Regulations do not provide for any control over paddy disposed of in this manner.

With respect to (c), as soon as paddy is delivered to a rice mill it falls under the control of the Board, and a careful check is kept of the movement of all stocks thereafter.

Paddy is parboiled and milled into rice which must be delivered to the Board at its main warehouse in Georgetown or at established receiving depots throughout the Colony. Upon its receipt at the Board's warehouse, the rice is weighed by licensed, sworn weighers, and it is on the basis of weights ascertained by these weighers that payment is finally made. A small quantity of rice is then bled from each bag of the consignment claimed by the producer to be of uniform quality and these samples are thoroughly mixed in order to obtain a composite sample of the entire consignment. The percentage of breakage of the rice is then ascertained by mechanical means and, after comparison with guide samples of the grading standards which are established annually, a grade is awarded. The producer is then paid on the basis of his weight and the grade awarded by the Board.

In the event of dissatisfaction on the part of the producer in respect of the grade, he has the right of appeal to a special committee set up for this purpose.

In order to provide against transportation delays, the Board issues, at its country depots, advance payments against consignments of rice in transit to the Board's warehouses.

Rice purchased from producers is bulk blended by mechanical means into particular grades required for distribution on the local market and for export. Local sales are effected in co-operation with the Transport and Harbours Department and there are twenty-seven established local sales depots throughout the 160 miles coastline, at which consumers may buy rice at uniform prices, freight charges being absorbed by the Board in order that retail prices might conform with the Price Control Regulations.

In 1946 agreements were concluded with the Governments of Trinidad, Barbados, the Leeward and Windward Islands, which provided for the full supply of the full requirements of rice to those islands for a period of five years at fixed prices, and for a further period of three years at prices to be negotiated at the end of the initial period.

In its functions as a marketing organisation, the Board operates along the lines of ordinary commercial enterprise and purchase prices are fixed in strict relation to the selling prices both locally and abroad, in order to ensure a relatively small surplus after defraying operating expenses.

The surplus funds so accumulated are held in reserve for the following purposes:

(a) To provide a Reserve in order to offset sudden fluctuation in export prices downwards.

(b) To finance schemes for the improvement and advancement of rice cultivation.

With reference to (b) the Board in 1943 sponsored a scheme whereby pure line seed paddy might be produced in bulk and distributed to farmers on a system of exchange or outright sale, in order to ensure the maintenance of the production of high quality rice and to promote a better quality in areas where the use of seed from crop to crop, over a long number of years, has resulted in deterioration.

Storage facilities offered by the mills being inadequate, the Board has constructed a number of bonds throughout the coastline which provide farmers with storage. The bonds also serve as distributing centres for pure line seed.

In addition, the Board decided to construct modern warehouses in Georgetown, specially designed to provide more economical handling facilities by the introduction of mechanical equipment. The construction of these new premises was completed in September, 1952.

A scheme was sponsored by the Board whereby farmers might require agricultural machinery on easy terms. The scheme embraced the importation by the Board of suitable equipment and the resale of same to producers under Hire Purchase Agreements. Under this scheme, 113 tractors, 148 ploughs, 103 harrows and 65 rice harvesters have been handed over to farmers.

In January, 1951, the Board embarked on a new phase of operations—on the packaging of high quality whole grain rice in attractively lithographed cardboard boxes, each containing 2½lb. of rice. This rice was released for the export trade only and results have, so far, been very gratifying. It is planned to expand this project as far as the availability of supplies will permit and incentives have been provided for encouraging the processing and production of the very high standard required.

Mahaicony/Abary Rice Scheme.

The scheme which was started in 1942 as a war measure in an attempt to fill the gap left in the supply of West Indian rice requirements by the fall of Burma, has developed into a large scale project in the commercial production of rice under conditions of mechanical cultivation. This scheme was at first Government sponsored and is now operated by private enterprise, viz., B.G. Rice Development Co. Ltd.

Due to the emergency conditions operating at its inception no experimental or pilot work was possible, with the result that it was found in the light of later experience that many of the more fundamental features of the lay-out were not only unsatisfactory but that they could not be easily changed. The geometrical lay-out of the scheme with no reference to the topography of the area and the dual purpose drainage and irrigation system are the most notable examples; in other words, all land to be placed under irrigation should be laid out on the contour where possible.

Besides the engineering and administrative problems posed by the erection and operation of the mill, a mass of agronomic and agricultural engineering problems have arisen and have had to be tackled. The technique

of underwater cultivation has had to be evolved in response to the exceedingly wet weather conditions prevailing in the Colony, there being, on the average, only forty (40) workable days per season for dry land cultivation of the seed bed and including sowing. The search for and study of machinery best suited to local conditions has just been started despite the fact that war-time allocations forced on the scheme a premature standardisation of equipment.

The absence of varieties suitable to mechanical reaping due to lodging and easy shattering of the varieties grown has resulted in a very serious drop seed problem which favours the spread of red rice. In the last two years the investigation and control of this problem and the question of the relatively low yields associated with mechanical conditions have been the main objects of the agronomic research carried out at the scheme under the full-time guidance of an officer of the Department of Agriculture. Average mechanical harvested yields are in the order of 5—7 cwt./acre. The average efficiency of mechanical harvesting is 40—60 per cent., i.e., approximately half the crop is lodged so bad that only 50 per cent. can be reaped by machine. Some very promising results along both lines of endeavour have been achieved although, in the case of drop seed control, any solution in the absence of suitable varieties for mechanical reaping can only be of a short term and palliative nature as reinfestation is a recurrent process.

An area of approximately 11,000 acres lying between the Mahaicony and Abary rivers have been impounded and this forms the main drainage and irrigation works. Of this area 5,000 acres are occupied by the scheme and the remainder by small holders who use part of their land for rice and part for cattle.

Irrigation water is led in from the Mahaicony and Abary rivers through a central canal running through the middle of the scheme to the Northern boundary canal. Two 80 ton-minute pumps situated at the South-western corner of the scheme on the Mahaicony can be used for either drainage or irrigation when required.

Drainage takes place through the same network of canals, the main gravity outlet being through the Northern sluices on the control canal to the sea. This system is unsatisfactory as proper water control cannot be maintained, especially in wet weather.

In addition to cultivating 4,300 acres on the scheme, agricultural machinery is made available for hire, primarily to farmers who supply paddy to the mill. Investigations have been going on for the past two years on the possibilities of a beef cattle-rice rotation. Results have not been promising, due to the cost of fence erection, Zebu blood being tolerant to any yet devised electrical fence, and the condition in which the cattle leave the ground—bog and wallow holes, etc.—requires extra work in relevelling for proper flood control of ensuing rice crops.

The existing equipment consists of:

75 Tractors (Case LA, McCormick W9 and WD9).
19 Three bottom mouldboard ploughs (Case, John Deere).
11 Four bottom mouldboard ploughs.
6 8½ft. one way disc ploughs.
11 6ft. one way disc ploughs.
10 Four furrow disc ploughs.
3 Six furrow disc ploughs.
40 Four gang disc harrows.

10 28 run seed drills.
10 24 run seed drills.
35 Tractor drawn all crop harvesters.
14 Self-propelled all crop harvesters.
18 Threshing machines.

The bulk of this equipment is U.S.A. manufactured and of various makes and models being brought together under the exigencies of war. This has led to the difficulty of not being able to standardise on any set line of plant.

At the same time some of the implements are unsuitable for the conditions. There is no counterpart present of the Australian "Sundercut" (plough-cultivator) which means that newly deep ploughed land has to be disc harrowed 4-5 times if a suitable seed bed is to be obtained. This working with disc harrows sends up the cost of production appreciably. Australian implements have been requisitioned for but manufacturers have been unable to supply due to home demands.

All of this machinery is maintained on the spot in a workshop equipped to handle major overhauls. The workshop also undertakes repair work for the agricultural machinery belonging to farmers in the neighbourhood. Part replacement, etc., is at present extremely difficult due to lack of dollar funds, and it is only possible to maintain approximately 40 tractors in operating condition though £10,000 worth of spares are kept in hand.

Another difficulty is the lack of skilled and efficient mechanics. These factors add appreciably to the cost of production due to working time lost and tied up equipment.

At the centre is a modern rice mill capable of producing five tons of cleaned rice per hour. The bulk of the equipment installed is of U.S.A. manufacture, and again the main difficulty is the obtaining of spares due to dollar shortage. Two new rice mills are to be built at Anna Regina and on the Corentyne Coast. These new mills are to be equipped with Robinson and Grantex machinery similar to that installed in the new Co-operative mill at Leeton, N.S.W. The equipment compares favourably with any on the world market from the cost and efficiency point of view.

The mill is installed to recover all the bran and polish with a minimum of loss and husk is conveyed to the boilers for use as a fuel. The paddy grown on the scheme is supplemented by paddy purchased from private farmers. The average price paid is penny half-penny per lb. All paddy reaped by combines must be dried before it is stored. This is at present mainly carried out by two artificial dryers though a certain amount is still done by the sun on a large concrete drying floor.

All the paddy handled by the mill is parboiled before it is milled. The process was adopted commercially because of trade requirements and legislation among the colonies and countries of the Caribbean area and at the same time from the milling angle—parboiling tends to harden the grain and make it less susceptible to breakage.