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THE FUTURE OF THE SUGAR INDUSTRY IN BARBADOS

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Introduction

The sugar industry of the West Indies, and Barbados in particular, is going through another of the periods of stress and change which have afflicted it from time to time during the last three centuries. These afflictions have taken several forms: disease (red rot); overseas competition, low prices and rising costs (necessitating the sugar bounties of 1850 — 1904 and the Brussels Convention of 1903); erosion; labour shortage; fires; social unrest; and so on. Nevertheless, Humbert[2] lists Barbados as the fourth best sugar-producing country in the world, which gives us some confidence that we can overcome the present crisis. Currently the problem is a multiple one consisting of a rapidly declining labour force (especially for harvesting) and costs of production which are rising faster than the income from the product; the main source of increasing costs is wages. A third problem has manifested itself in the last two years — malicious or unintentional cane fires.

Some Problems Reviewed

Labour Shortage

A number of factors have been responsible for the shortage of labour, though little work seems to have been done to try and pinpoint the relative importance of the various factors. Firstly, a stable political climate, enterprising developmental work on the part of private investors and the Government and a growing tourist industry have resulted in an increase in jobs which are less arduous, better paid, and generally less seasonal, than work with sugar cane. Secondly, there has developed considerable social pressure against working in an industry which still has the traditions of slavery attached to it in the minds of many people; to a foreigner, like myself, it seems incredible that people still worry about something which affected only their great-great grandparents. However, the fact that the majority of managers are white whilst all the labourers are coloured or "poor" white, and the lack of positive action on the part of the Industry to counteract "vote-catching" propaganda, have resulted in a man being regarded as something of a failure if he has to work in the cane field. Thirdly, the high rate of emigration, and the high wages in America and Europe are now resulting in a considerable flow of money back to relatives in the Island; last year over 7 million dollars were sent to Barbados, presumably removing the need for several thousands of people to work.

Now there is no reason to expect a slackening of industrial and tourist development, there is every prospect of wages going up rapidly in these developments, and there is no reason to expect that overseas remittances will decrease. On the other hand it may be possible to counteract the social stigma of agricultural work by a vigorous programme of improving working conditions, partial mechanisation resulting in increased productivity for less physical effort, rising wages concomitant with a smaller labour force, the security of year-round employment possible with greater diversification effort, and such things as the introduction of showers and lockers. If we assume that there will be a shortage of good workers (including drivers) until wages at least reach parity with small industries, building workers, etc., then inevitably the Industry must evolve to a labour force of perhaps one third of the present number by, say, 1980. This must be so since the total wage bill at present is probably about as high as it can go and increased productivity will incur the additional expense of imported machinery. Incidentally the arguments above also apply to management; a significant number of managers and overseers are at present leaving the industry for better-paid jobs. Up to now, labour from other islands has helped to tide over the most crucial time of labour-shortage, but this is for various reasons an undesirable state of affairs, and will almost certainly be a temporary phenomenon because of parallel developments in these other islands.

Rising Costs

The problem of rising costs is mainly a question of wage-in-relation-to-productivity. Wages account for 54 per cent of field cost and 34 per cent of factory cost, and the wages-cost per ton of sugar has been rising faster than the cost of machinery and general overheads, including salaries. One might ask why an Industry has allowed itself to become involved in such a position; the answer is two-fold. Firstly, sugar cane is an extremely difficult crop to mechanise in the field under our conditions of soil, slope and rainfall (and, with the present arrangement, factory automation is also rather expensive and difficult). Secondly, because of the high population density and the fact that sugar cane has been the only consistently reliable basis for the economy for so many years, there has been tremendous social, political, and moral pressure on the Industry to employ large numbers of people. I have personally been most impressed by the sense of responsibility which many managers feel towards this

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1 I would like to stress at the outset that my economics is that of an amateur, and that my employers may not necessarily agree with my conclusions.

2 Humbert, R. P., **The Growing of Sugar Cane**, Elsevier, 1968

problem, even to the detriment of the economy of their estates. The main result of this pattern has been that the sugar industry retains a very high proportion (about 90 per cent) of its total foreign earnings within the Island,[1] which would not be so in the case of extensive mechanisation. The trend of wage increases shows no sign of abating, and the annual figures for costs of production are going up steadily. In fact it is noteworthy that between 1954 and 1965 the cost of producing a ton of sugar from cane had risen by over 50 per cent while the cost of producing a ton of sugar from beet fell by about 15 per cent.[2]

Granted, then, that costs with the present methods of production are rising, and will continue to rise in the foreseeable future, we ask if there is equally good prospect of the price rising. With regard to the ISA we are assured that the price will not fall disastrously low but there is no reason to expect that the ISA will result in a price as high as the CSA price, and we think that it may be $40 – $50 less in the long run (present price of sugar is £34. 10.0. per ton). With regard to the CSA we have three reasons for anticipating only small increases in price — the prospect of Britain joining the European Community,[3] Britain's balance-of-payments difficulties, and the falling costs of beet-sugar production. With regard to the small North American quota which we enjoy, and about 12,000 tons of locally-consumed sugar, the future is promising, but these outlets will account for only a small part of our production in the foreseeable future. It is now generally agreed that we could not, and should not, expect the value of a ton of sugar to increase as fast as the current increase in costs of production.

Cane Fires

The future with regard to cane fires, the third problem facing the industry, is rather complicated. Evidence is building up that the originators of the majority of cane fires in the crop period are the cutters, particularly those who are employed during crop only (labour from other islands, local masons, etc. who will return to a good job after crop has finished); these people have little or no interest in the size of the next crop and, from their own point of view, it is entirely logical to burn the cane before harvest, since this about doubles their productivity.[4] With our present methods of culture and varieties, the loss of the trash mulch results in a loss of ½ – ¾ ton of sugar per acre in the succeeding crop (depending upon area and rainfall), and immediate losses of sugar from deterioration before milling and appreciable losses due to the fact that fields are often burnt before they are ripe.[1] From an agronomic point of view burning is thus very undesirable. On the other hand it is the simplest method of increasing labour productivity at harvest and, indeed, the majority of cane cutting machines, and all loaders, require burnt cane to operate properly. There is a steadily increasing proportion of cane and trash acreage which is burnt each year (11.34 per cent in 1966, 22.79 per cent in 1967, 38.90 per cent in 1968).[2]

PROPOSED SOLUTIONS

As mentioned earlier, this isn't the first time that the sugar industry has faced a gloomy future, although perhaps the reasons for apprehension are more complex than at previous times.

The first possibility is to change to another crop or crops. This possibility has been suggested many times for economic, ideological or technical reasons, and by many people. Unfortunately, when one gets down to hard facts the possibility does not look at all promising and the position now is that the Ministry of Agriculture's Development Plan includes the target of 180,000 tons of sugar annually. The reasons have been summarised by Gooding[3] in a series of investigations into alternative crops; briefly these alternatives fall down on one or more of the following difficulties: unsuitability of soils, erratic distribution of rainfall, erosion hazard, low gross return per acre, restricted or unpredictable markets, pests and diseases. It must also be remembered that there is a considerable capital investment in factories and the sugar terminal, neither of which would be very useful for other crops, and a considerable amount of expertise in growing and processing sugar cane. Finally, it must be remembered that farmers in Barbados have not, as is often assumed, been unwilling to grow crops other than cane. Tobacco, cotton, many types of vegetables (including tomatoes for export in the 1930's), have been grown commercially, and we produce yams, sweet potatoes and eddoes on a field scale not matched by any other sugar-producing country. But in spite of this, experience has shown that a grass crop, sugar cane, has been the best basis for agricultural production.

The second possibility is less drastic — namely to contract the acreage in sugar cane and concentrate on the most profitable areas with a smaller annual target and a reduction in the number of factories. Hudson[4]

1 Norris, R., Personal Communication, 1969

2 Sturrock, F. G., 'Sugar Beet or Sugar Cane?', **J. Agric. Econ.** 20, 1969

3 Warley, T. K., **Agriculture: The Cost of Joining the Common Market, (European Series No. 3), P.E.P.,** Chatham House, 1967

4 Hudson, J. C., **Burning and Sugar Production in Barbados,** Edgehill, Barbados, 1968 (cyclostyled)

1 **Report of the Cane Fire Commission to the Government of Barbados, 1954**

2 Figures supplied by Barbados Sugar Producers' Association (Inc.)

3 Gooding, E. G. B., **Reports to Sugar Producers' Council from the Agronomy Research Unit,** Edgehill, Barbados; notably 'Crop Diversification in Barbados', 1965 onwards

4 Hudson, J.C., **A Diagrammatic Method for Determining Profitability of Various Systems of Cane Management and Investigating Yield Relationship to Profitability,** Edgehill, Barbados, 1966 (cyclostyled)

explored such questions using a simple diagrammatic method of allocating costs and returns. Briefly the conclusion was that as long as at least two factories went out of production and "forcing back" became the established practice, it would be profitable for sugar cane to be abandoned on about 10 per cent of the acreage. Subsequent work by Hudson[1] defined about 4,000 acres as qualifying for immediate withdrawal. Further reduction in the production would meet with steadily increasing difficulty in maintaining profitability without a major reorganisation of the structure of the Industry's overheads. But the problem which then arises is, what to grow on the land which is marginal for sugar cane? And the answer is that these are the same areas which are even more marginal for other systems of production unless *irrigation* is available; fortunately some irrigation is possible in many marginal areas and there is renewed interest in these areas for vegetable production.

The third possibility is simply to take the Industry as it is and explore every technical possibility of overcoming the problems of labour productivity and rising costs. These possibilities are briefly listed below. With regard to the problem of fires my own view is that this problem could be resolved by following the lead of other countries faced with the same problem (for example Mauritius, St. Kitts) and refuse to reap burnt cane unless the cause of the fire has been established; eventually we may adopt a system of controlled burning at harvest (in some circumstances anyway), but the eradication of uncontrolled fire will be essential even in this eventuality. We must now briefly examine the possible developments which could solve these problems.

Increasing the Value of a Ton of Cane

Reaping, loading and transporting a ton of cane costs roughly $6.50—that is over a quarter of the total value of the sugar in it. This figure is similar to that for sugar beet,[2] but whereas it takes less than 8 tons of beet to make a ton of sugar (and often much less than 8), it can take over 9 tons of cane (and often much more). But we know that it is possible with strict attention to variety, harvesting schedule, etc., to achieve conversion figures much better than this — individual loads or fields, even in February, taking 8 or fewer tons of cane to make a ton of sugar. We have therefore placed great emphasis on cane quality in our research and hope that before long the Industry will translate our findings into profit by devising and introducing a system of incentive payments for high quality cane — as is considered the backbone of efficiency in some other countries, notably Australia.

Secondly, we continue a tradition at Edgehill of keeping an eye open for the use of by-products. The value of the fibre, molasses and even waxy cuticle is appreciable. One promising line is at present being investigated elsewhere in the West Indies.

Increasing the Productivity of Hand Labour

People are the most versatile and skilled machines for weeding, cutting, cleaning and loading cane. Rather than replace them with clumsy, expensive and exacting machines it would be better, if possiible, to aid their physical efforts and pay more highly for their skills. To this end we are investigating a very wide range of methods for reducing the physical effort required for the various operations. Some of these ideas are in the very early stages of development and I don't want to say too much yet but we have plenty of evidence from other countries and from our own experiments that considerable improvements can be made in the productivity of weeding and harvesting (and food-crop management and harvesting)—choice of varieties, short-season plant-cane, self-loading trailers or "pallets" system, the controlled burning of fields due to be ploughed up, potato lifters, small power tools, etc.

One of the simplest methods of increasing labour productivity at harvest is pre-harvest burning, mentioned earlier. Although we know that this practice (except in last-crop fields) is disastrous at present, we have initiated research into varieties and cultural techniques which might permit the use of controlled burning in at least some circumstances.

Replacement of Hand Labour by Machines

At the same time we are making a start on the search for machines which could, if necessary, completely mechanise all aspects of production. The most difficult problem will be machines to cut cane, the other operations, like planting, weeding, and even loading being basically easier to solve. This involves the importation of a wide range of machines and their trial, or even adaptation. Harvesting is difficult because of topography, difficulty of obtaining suitable headlands and the probable necessity to burn. If we were ever forced to totally mechanise the production with existing machines, various advisors have told us that an appreciable proportion of the land presently in cane would have to be put into some other crop. We are even contemplating at present the possibility of designing a harvester to meet our requirements.

Varieties

Whatever system of management and mechanisation is eventually chosen, varieties will play a key role. For this reason we are giving as much support as possible to the Variety Testing Station as well as having initiated a programme to find a method suitable for the rapid evaluation of mechanisable varieties.

"Forcing Back"

There are some important advantages to be gained from changing to a system of short-season or "forced-

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1 Hudson, J. C., **Ecological Groupings of Barbados Sugar Estates**, Edgehill, Barbados, 1968 (cyclostyled)

2 Sturrock, F.G., **op. cit.**

back" first-crop cane: the cane is much easier to handle, being more upright and freer of pests,[1] the sequence of harvesting and ploughing is made logical, and the area under cane can be increased to compensate for yield losses incurred by mechanisation (for example burning). Some progress has been made in finding varieties and techniques which are practical and larger-scale trials are to be laid down.

Processing Costs

We are often asked why we are not building a few large modern factories to replace the large number of small factories which are considered by many "experts" to result in higher overhead expenses. If the Industry was being started from scratch this might be the best method but simple calculations have shown that the interest alone on the capital needed for such an approach would be more than the present processing costs! Add to this the fact that our road system is too narrow to accommodate the larger transport system required by an evolution to a few large factories, and it does make sense to work from the present situation gradually to a reduced number of factories based on the better ones. At present there is really no coherent policy of closure and there have been a number of examples of factories installing new and expensive equipment, only to go out of production a year or two later. By and large the technical efficiency of our factories is as good as anywhere in the West Indies. Modern equipment, including automatic process control systems, is being introduced steadily to increase labour productivity and improve product quality.

Bulk Handling of Sugar

This last example of the evolution of the Industry is already an accomplished fact, and a successful and efficient example of the fact that the Industry is capable of bold and expansive action when necessary.

One other matter requires brief mention. Economists would require that I say something about estate sizes. At present we have estates ranging in size from 100 to 1,300 arable acres together with a number of estates between 10 and 100 acres, most of which are managed as part of a larger unit, and a large number of small-holders with 10 acres and less. There is undoubtedly a trend towards larger units, and many estates are part of, or mortgaged to, one of a small number of larger companies. But there is no trend towards the giant estates common to much of the West Indies and a sturdy individuality is maintained amongst the 200-odd estates. This has a considerable psychological advantage and results in a keen and able management. On the other hand it is a disadvantage at times of crisis since it takes that much longer to agree about a common policy—for example on quality payment, mechanical harvesting or a common approach to the fire problem. I think this may be one reason for the "brinkmanship" at which the Industry seems to excel and I personally have great faith that when the pinch is really felt, you will see rapid and enterprising changes in the Barbados Sugar Industry.

[1] Villafane, E. G. et al, **Algunos Factores que afectan la efficiencia del Cortador de Cana en Puerto Rico, (Bulletin 210)**, Universidad de Puerto Rico, Estacion Experimental Agricola, 1968

Summary

The problems facing the Industry include rapidly rising costs, a dwindling force of able labour, a poor prospect of increasing prices for sugar and a rapidly increasing number of cane fires. Solutions to these problems are being vigorously sought and include techniques of total and partial mechanisation, attention to cane quality, a vigorous search for more suitable varieties and a basic reappraisal of all the steps of production. A switch to alternative crops does not at present look promising.

REFERENCES

Deere, N., **The History of Sugar**, Chapman and Hall, London, 1949.

Gooding, E. G. B., **Reports to Sugar Producers Council from the Agronomy Research Unit,** Edgehill, Barbados; notably 'Crop Diversification in Barbados', 1965 onwards.

Hudson, J. C., **A Diagrammatic Method for Determining Profitability of Various Systems of Cane Management and Investigating Yield Relationship to Profitability,** Edgehill, Barbados, 1966 (cyclostyled).

———— **' Ecological Groupings of Barbados Sugar Estates,** Edgehill, Barbados, 1968 (cyclostyled).

———— **' Burning and Sugar Production in Barbados,** Edgehill, Barbados, 1968 (cyclostyled).

Humbert, R. P., **The Growing of Sugar Cane,** Elsevier, 1968.

Stevenson, G. C., Sugarcane Varieties in Barbados; An Historical Review, **(Bulletin 39),** B.W.I. Central Sugar Breeding Station, Barbados, 1958

Sturrock, F. G., 'Sugar Beet or Sugar Cane?', **J. Agric. Econ. 20, 1969.**

Villafane, E. G., Pringle, G. E. & Ramirez, A. C., **Algunos Factores que afectan la Efficiencia del Cortador de Cana en Puerto Rico, (Bulletin 210),** Universidad de Puerto Rico, Estacion Experimental Agricola, 1968.

Warley, T. K., **Agriculture: The Cost of Joining the Common Market, (European Series No. 3),** P.E.P., Chatham House, 1967.