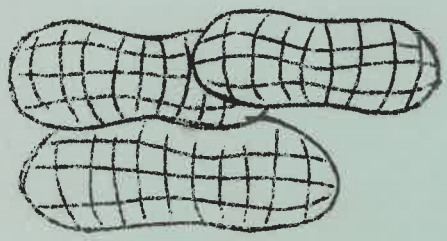
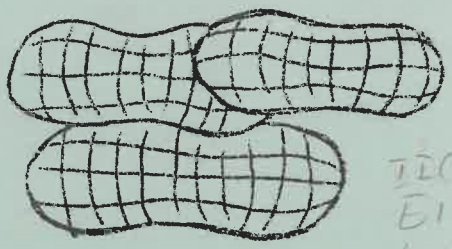




BENCH MARK

FOR

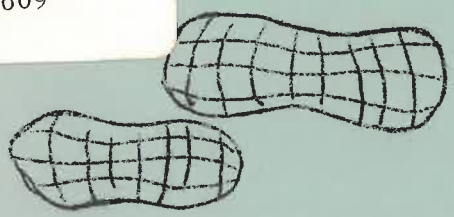
A PROJECT PROFILE

FOR

DEVELOPING A PEANUT INDUSTRY

IN

JAMAICA



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D E V E L O P I N G A P E A N U T I N D U S T R Y

I N

J A M A I C A

FOREWORD

Although the peanut has been grown in Jamaica for several decades and in spite of the fact that its uses are universally known, the performance of this crop falls considerably short of its potential in Jamaica.

Its various uses together with its potential for substituting imports and earning foreign exchange in its own right provides justification for developing the local peanut industry. Both nationally and within the ambit of the Caribbean Common Market (CARICOM) of which Jamaica is an important partner, it is desirable to develop feasible projects which can assist in reducing the heavy reliance on extra-regional imports, while at the same time increasing farm incomes and eventually improving the standard of living of farmers. Cropping systems developed by GOJ/IICA for hillside farmers further attest to the increased potential for using the peanut in this direction.

The Benchmark which has been prepared by Dr. I. E. JOHNSON, assisted by Drs. A. Wahab and P. Aitken of the IICA Office and Mr. Horace Payne has as its main objective the preparation of background information necessary for formulating a national Peanut Project for funding, and for ultimate implementation by the Government of Jamaica.

PERCY AITKEN-SOUX
DIRECTOR

****

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BENCH MARK
FOR
A PROJECT PROFILE
FOR
DEVELOPING A PEANUT INDUSTRY
IN
JAMAICA

by

I.JOHNSON, A.WAHAB, P.AITKEN, H.PAYNE

1980

OUTLINE

		Page
	Foreword	
	List of Collection of Papers, Agriculture in Jamaica, IICA Office in Jamaica	(i) - (iv)
1.	Introduction	1 - 2
2.	Background against which the study is being undertaken	3 - 4
3.	General Information on the Peanut	
	- Botanical Aspects of the Peanut	4 - 5
	- Agronomic Considerations	5 - 7
	- Ecological Zones for Peanut Production	8 - 10
4.	Uses of the Peanut	
	- Peanut as a Soil Improvement Crop	11 - 12
	- Peanut as a Human Food	12 - 15
	- Animal Feed	15 - 16
5.	Development of the Peanut Industry in Jamaica	
	- Local Action	16 - 18
	- Role of IICA/Jamaica	19 - 21
	- Production Levels	21 - 24
	- Farming Systems	24 - 28
	- Description of Problems	28 - 35
	- Land Availability	35 - 36
6.	Demand for Peanut and Peanut Products	
	- Existing Demand (Jamaica)	36 - 45
	- Potential Demand (Jamaica) and Supply	45 - 57
	- Regional (CARICOM) Demand	58 - 67
7.	Miscellaneous	68 - 76
	- Farmer Organization	
	- Land Preparation	
	- Seed Quality	
	- Marketing	
	- Co-operative Aspects & Financing	
	- Production Costs	
8.	Rationale for the Development of the Peanut Industry in Jamaica	77 - 80
9.	Summary of Bench Mark Information for Expanding the Peanut Industry in Jamaica	81 - 84
10.	Sources of Information	85

Outline cont'd

11. Annexes:

(1) Johnson, I.E. - Assessment of Peanut Production and Demand in (A) Barbados (B) Trinidad

(2) Wahab, A.H. - Assessment of Peanut Production and Demand in Guyana

(3) Payne, H. - Guidelines for Management and Technology in Peanut Production in Jamaica

(4) Martin, Edward and Payne, H. - A Peanut Development Programme for Jamaica

(5) Guthrie, Leslie - Position Paper for Peanuts in Jamaica

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Guyana

IICA - Dr. Reginald Pierre - Production Socialist

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State Planning Secretariat

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Guyana Co-operative Agricultural & Industrial Development Bank

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CARICOM Corn and Soya Regional Company

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Squirrell Manufacturing Industry

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Guyana Sugar Corporation (GUYSUCO)

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- Mr. Charles Lawrence, Other Crops Division

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- Mr. Roland Fletcher, Director, Guyana Office

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- Mr. D. D. Henry, Director of Extension
- Mr. L. McLeggan, Parish Manager (Agriculture) St.Elizabeth
- Mr. L. Guthrie, Extension Specialist, Legumes
- Mr. L. Hutchinson, Farm Management Specialist, Planning and Review Division
- Mr. Edward R. Martin, Agronomist, Crops and Soils Division
- Mr. Vincent Campbell, Agronomist Crops and Soil
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- Mr. H. Jones, Area Agricultural Officer, Holland Mountain, St. Elizabeth

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- J. Suah, Director, Jamaica Office
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- Mr. John Harrison, General Manager
- Mr. R. E. Summons, Marketing Manager

Jamaica Frozen Foods Limited

- Mr. V. Rattray, Purchasing and Marketing Manager

Jamaica Soya Products Industry Ltd.

- Processing Manager

Jamaica Nutrition Holdings Ltd.

- Mr. E. Clarke, Director, Economics Division

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- Mr. G. S. Titus, President

Organizations and Persons Contacted Cont'd

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- Dr. Warren Sorsythe, Mission Director, IICA/Barbados
- Victor Ojeda, Agricultural Economist

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- Dr. Don Walmsley, Leader, Barbados Mission

Caribbean Development Bank (CDB)

- Mr. F.A.R. Mullings, Economic Development (Director)
- Ms. Joan Ferguson, Economic Development Division
- Mr. Arnold Cruickshank, Agronomist, Agricultural Division

Trinidad

- Armando Reyes, Director, IICA/Trinidad

Ministry of Agriculture

- Dr. E. Patrick Alleyne, Permanent Secretary
- Mr. Foster Bissessar, Director of Planning
- Mr. R. Rampersad, Co-ordinator of Development Programmes & Chairman IICA/MINAG (Trinidad Co-ordinating Committee)
- G. Buckmire, Economist, Co-ordinating Committee

University, West Indies

- Prof. L. A. Wilson, Department of Crops and Soils, Faculty of Agriculture
- Dr. Lloyd Rankine, Department of Economics, Faculty of Agriculture

Holidays Foods Limited

- Mr. Lennox Assang, General Manager

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1. INTRODUCTION

In spite of the fact that the uses of the peanut are well known, over the years there has been relatively little indication of sustained effort to increase local production. Local production has been rather inefficient, yields per acre low, and unit prices high. In the circumstances, it was easier to import peanuts. Within recent years the situation has been changing somewhat, and more consideration is being given not only to strategies for increasing local production, but also to the possibilities of extending the local uses of peanut and peanut products. There is evidence to support the view that the developmental potential of the local peanut industry has not been exploited. Indeed, farmers themselves within the last two years have been seeking government assistance in developing an expanded peanut industry.

1.2 Economic stresses which affect all countries, but more so those which on a global basis are regarded as less developed countries (LDCs), including Jamaica, have forced many countries to place greater emphasis on producing more of the food which they consume. This forms only a part of the much larger exercise of achieving greater self-sufficiency, while at the same time saving on foreign exchange earnings.

1.3 A study of Jamaican imports of peanuts and peanut products over the years indicates that the country used to import relatively large quantities of peanut and peanut products from extra regional Caribbean Common Market (CARICOM) countries, but also imports a significant quantity of peanut products from CARICOM countries. The proposed Caribbean Food Plan of CARICOM was expected to come to grips with these problems, but such action as has been forthcoming has been extremely slow.

1.4 Due to economic and other constraints, Jamaica like other CARICOM countries, finds itself with many problems where

agriculture in general and food supply in particular are concerned. Products imported are being obtained at increasing prices. Additionally, and in the final analysis, exporting countries themselves are finding it more difficult to supply quantities requested by importers since they too are endeavouring to achieve a higher degree of self-sufficiency. Increased energy costs and the associated escalator and multiplier effects have forced greater emphasis on local production.

1.5 Within the context of CARICOM membership the "spirit" has been to preserve certain positions for its LDCs (ie., in terms of a comparison within the CARICOM itself since all CARICOM countries except one are regarded as LDCs members vis-a-vis its MDCs members, on a world-wide basis). The wide gap in regional production in relation to existing and potential demand for peanut and peanut products indicates clearly that should it prove feasible to develop an expanded peanut industry in Jamaica this will in no way create any adverse effect on the development of peanut industries for other member countries of CARICOM.

1.6 The profile of local peanut production has given reason to believe that a much larger industry can be developed in Jamaica. Indeed so encouraging has been these results that funding from a large international agency has been promised for formulation and implementation of an economically feasible project. Additionally, processing facilities have been promised from existing processors to assist in developing the industry along the lines required.

1.7 A reconnaissance study has been undertaken to re-assess the supply and demand situations for peanuts and peanut products within the CARICOM countries and to determine what production proposals exist within the region with a view to avoiding any inter-regional conflicts, while at the same time endeavouring to meet national goals for development.

2. BACKGROUND AGAINST WHICH THE STUDY IS BEING UNDERTAKEN

2.1 Information available in Jamaica indicates rather clearly that the use of the peanut and its products can be greatly extended to the advantage of consumers and producers alike. Given existing levels of technology and cost/price relationships production can be greatly increased. Additionally, with the improvement of technology and an extension in the application of this improved technology, it is possible to produce at more efficient levels, thus providing a potential for considerable expansion of the local industry.

2.2 In addition to the improvements over existing practices for peanut production, improvements in other aspects of agricultural production have opened up a wide range of possibilities where local peanut production is concerned. Jamaica has some 1,500,000 acres of land in agriculture of which about 80% is steep. It is on the sloping land nearly all the local production of food is undertaken by the small farmers, who account for some 90% of production. Recent measures being persued by Government, and research and demonstration projects being carried out jointly by the Ministry of Agriculture (MINAG) and the Inter- American Institute of Agricultural Sciences (IICA) have shown that peanuts can be produced economically on these steep lands under cropping systems which are extensive but which must be associated with appropriate and sound soil conserving measures.

2.3 Preliminary information also indicates that given the application of these cropping systems, it will be possible to reduce considerably the unit cost of production of peanuts. This is a necessary requirement if locally produced peanuts are to be used for manufacturing purposes. Additionally, however, the adoption of these cropping systems will increase land availability for peanut production as an intercrop or associated crop without affecting

the use of the land for other crops.

2.4 Similarly, experimentation with other cropping systems has indicated that the land used traditionally for peanut production can be used more effectively and that lands used specifically for some major crops such as sugar cane can be judiciously rotated to increase land availability for the production of short-term crops such as the peanut.

2.5 The high cost of imported food, the potential foreign exchange savings, as well as foreign exchange earnings and other benefits which can be derived from the production of peanut oil and other peanut derivatives provide additional support for the study. The study is intended to provide information and the rationale for determining the feasibility of expanding the local industry, as well as the conditions and requirements for such an expansion. Questions as to the magnitude of the expansion which is possible would also be answered.

3. GENERAL INFORMATION ON THE PEANUT

3.1 Botanical Aspects of Peanuts

The peanut (Arachis hypogaea L.) also called Groundnut, had its origin in the Gran Chaco area of tropical South America, (Bolivia, Paraguay) and was probably introduced into Jamaica with the slave trade.

3.1.1 Botanically, peanuts belong to the leguminosae family and are popularly distinguished according to the habit of their stems. If the stems are prostrate, the type is called a Runner, and if upright, the type is referred to as a Bunch. Breeding has led to the development of numerous spreading bunch types.

3.1.2 Peanut plants usually acquire a height of 1 - 2 feet and possess a well developed tap root system, with many laterals and adventitious roots. Feeding occurs directly through the external tissues of the roots which

are lacking in root hairs. The ability to root deeply has made peanuts economical to grow on poor soils where most other crops would not be an economical venture. This extraordinary ability has caused many to treat peanuts as a scavenger crop. However, the crop responds well to appropriate fertiliser application. The leaves are pinnate with two pairs of leaflets that possess moderately hairy surfaces. As the crop matures leaf senescence begins from the base of the plant.

3.2.3 Peanuts produce small yellow flowers that are self-pollinated as a rule (less than 2% outcrossing obtains). After fertilisation, the base of the ovary elongates to form a 'peg' which on entering the soil allows the fertilised ovules to swell and form the pod. The 'pegs' or fruit provide the plant with a secondary root system capable of absorbing nutrients. The fact that peanuts produce their fruit underground makes the agronomy most interesting.

3.1.4 The mean oil content of bunch types tends to be higher than that of runner types mainly because the portion of mature nuts is higher as a result of the difference in the length of the growing period. Mechanical lifting is generally easier with upright bunch types. These factors, therefore, combine to give bunch types a distinct advantage over runner types in Jamaica.

3.2 Agronomic Considerations

3.2.1 Soils

Peanuts are grown successfully under a wide range of soil conditions. The most important requirement for successful peanut production is good drainage which depends on the physical characteristics of the soil. Coarse textured soils - loam and sandy loams - that are easy to work are usually ideal but the structure or state of aggregation of the soil particles is of paramount importance.

3.2.2 The peanut plant produces its pegs underground and those which do not penetrate the soil do not develop into pods. Hence the soil must provide the loose and open condition essential for good pod development. Jamaica bauxite soils although texturally classified as clay loams - St. Ann's Clay Loam - Map No. 70, and Chudleigh Clay Loam - Map No. 73 - possess strong crumby structures that give areas occupied by these soils the highest peanut productivity rating.

3.2.3 Clayey areas should be avoided for peanut production as the soil sticks to the nut making harvest difficult, while black or red coloured soils which stains the peanut grade and renders it unattractive for the "Ball Park" 1/ market. It is for this reason that the light coloured brown bauxite soils should be selected over the red bauxite soils for peanut production.

3.2.4 Stoniness will hamper mechanical operations, while shallowness (of less than 1 ft.) will prevent the plant from developing a root system capable of withstanding drought. Best crop performance, therefore, occurs on deep soils with a moisture holding capacity of 1.0 to 1.5 inches of available moisture per foot depth, and a top layer of moderate organic matter content capable of ensuring suitable air/water relationships.

1/ Nuts roasted in the husk and sold in small packages at various ball games and amusement parks.

3.2.5 For satisfactory production of peanuts the chemical status of the soil is of secondary importance to its physical features, as adjustments in soil reaction and nutrient deficiency can readily be made through appropriate liming or fertilising practices. Optimum soil reactions occur in the slightly acidic to neutral range - pH 6.2 to 6.5 - at which symbiotic fixation of atmospheric nitrogen is most efficient, although peanuts are known to tolerate extremes of soil reaction from pH 4.5 to 8.3.

3.2.6 Peanuts are a clean cultivated crop which should be grown only on flat or gently sloping areas - less than 10% slope, unless special soil conservation measures such as terraces are applied.

3.2.7 Excellent soil conditions for peanut production occur on the recent alluvial soils - Yallahs loam, Caymanas Loam and Sandy Loam, the Agualta Loam and Sandy Loams, to mention but a few of the major soil types delineated in the soil survey carried out by the Regional Research Centre of the University of the West Indies. Appendix 1 records the extent and distribution by parish of the soils of Jamaica on which peanut production will be most advantageous.

3.2.8 The time of planting peanuts is determined by the dry conditions required at harvest. Having determined the period taken for the crop to mature the planting date is calculated by subtracting the known maturationperiod from the commencement of that required for reaping. Work done in Jamaica [2/] seems to indicate that the crop is affected by photoperiodism. In this context it should be observed that when the days are short, temperatures are also decreasing and so is water under rainfed production conditions, thus making it difficult to ascertain the specific roles played by each factor in determining the performance of the peanut.

2/ Allsides Project, IICA/Jamaica, South Trelawny

3.2.9 Suitable Conditions for Harvest

In Jamaica there is considerable variation in the period for maturity, depending on whether establishment occurs in the spring or fall. Under irrigated conditions spring-planted Valencia (Jamaica local) matures faster, in a mere 90 days. Fall-planted peanuts, however, require at least 105 days for maturity. (This observation indicates how high temperatures aid maturity). The significant factor associated with runner or bunch types is that runner types take considerably longer to mature (30 - 50 more days) than bunch types. Bunch types are thus better suited to the short wet seasons experienced on flat areas of Jamaica where the crop can be grown without erosion dangers or expensive soil conservation measures that become essential on hillsides.

3.3 Ecological Zones for Peanut Production

Climate and soil factors interact in many areas of Jamaica to give the country a tremendous potential for high quality peanut production.

3.3.1 Very favourable conditions for the production of peanust exist on the recent alluvial soils within the 25 - 50 inches annual rainfall zone on the southern sector of the Island, as a result of its distinctly seasonal distribution. In this Zone, fall rains extend from September to November and are usually sufficient to support peanut growth. The marked reduction in precipitation with the advent of the winter season in December ensures maturity under dry conditions which are very important for satisfactory harvest and for high quality peanuts. A "petite carmen" occurs in April/May. These spring rains are unreliable and often too short and insufficient for successful peanut production without supplemental irrigation which fortunately is possible from the numerous wells or rivers occurring in the Zone.

The high evaporation demand (0.2 inches per day) combines with deficiences of rainfall during the summer period to create conditions favourable for satisfactory harvest. Temperatures are uniformly high and humidity generally low favouring rapid growth with minimal hazards of disease.

Hence in this Zone two seasons, spring and fall, meet the requirements for high quality peanut production. No other extensive ecological zone in Jamaica experiences such a favourable combination of factors as that which exists on the southern plains. The traditional production of peanuts in St. Elizabeth attests to this factor.

3.2.2 The extensive hard white limestone plateau on which the well-drained bauxite soils occur provides another suitable peanut ecological zone. In this region annual precipitation varies from 50 to 100 inches and periods of distinctly wet and dry conditions are less marked than on the southern plains. However, any problems due to moisture distribution are offset by the excellent structure of the soils involved that prevent sticking of the soil to the nut.

The cooler temperatures caused by increased elevation have been observed to prolong the maturation period, while the frequent occurrence of the misty conditions at night, periods of heavy cloud and high humidity cause increased incidence of Cercospera. However, the gentle slopes of some of these areas combine with good soil tilth to impart to the zone a high potential for peanut production.

3.3.3 Finally, in terms of geological considerations, formations of Trappean conglomerates, shales and tuffs characterised by their precipitous slopes and high total rainfall without any reliable dry period for satisfactory

harvest and sundrying conditions are not generally suited for peanut production.

3.3.4 If the benefits of agro-industrial development of the peanut industry are to be realised, it is desirable to select and concentrate on suitable ecological zones of production. This should lead to economies of scale and also to more efficient operations in relation to collection, drying, storing and marketing.

3.3.5 Although peanuts can be produced in many areas in Jamaica, production is not very widespread. The more traditional areas of production are on the flat lands, where the limiting factors are land and water. There is usually great competition from other crops for suitable peanut producing lands, and to date the profile of peanut production has not indicated that the crop has been an economic success. Although St. Elizabeth is the parish in which peanut production has been most successful, productivity is low. This is due mainly to limitations set especially by water shortage, lack of seed and inappropriate technological practices.

3.3.6 Consideration is being given to using a number of short-term crops(including the peanut as an inter-crop for sugar cane just prior to the period when the crop is to be replanted after several ratoons). The main objective is to optimise farm income. Although it has been reported that the peanut has proven to be a useful intercrop for sugar cane under certain specific conditions, in Jamaica, there is much skepticism about such a combination. At a seminar on legumes held at the Jamaica School of Agriculture, Twickenham Park, as recently as February 28, 1980, a representative of the Sugar Industry Research Institute stated that farmers did not exhibit any real desire for inter-cropping sugar canes with peanuts. On balance, at the moment there seems to be little local information, or little desire on the part of cane farmers to use peanuts as an inter-crop for sugar canes.

4. USE OF PEANUTS

Every part of the peanut plant is useful to man. Its numerous uses are best considered under three headings:

(1) Soil Improvement Crop

(2) Human Food or a Livestock Feed

(3) Industrial Uses

4.1 Peanut as a Soil Improvement Crop

Being a legume the peanut can produce much of its own supply of nitrogen and this appears to be the case in Jamaica where effective strains of Rhizobium bacteria occur naturally. This reduces considerably the necessity to inoculate the soil with the appropriate bacterium.

TABLE 1 - Nutrients Contained in a 3,000 lb. Crop of Peanuts

	Nutrients				
	Nitrogen lbs.	K_2O lbs.	CaO lbs.	MgO lbs.	P_2O_5 lbs.
1980 lbs.kernels	87	17	2	6	20
1020 lbs.hull	7	14	4	2	1
400 lbs.hay	79	82	55	25	11
TOTAL:	173	113	61	33	32

Source: "The North Carolina Agricultural Extension Service U.S. Department of Agriculture, 1970 ".

Information presented in Table 1 shows the composition of a total biomass of 3,400 lbs. harvested from an acre of peanuts. Under conditions in which only the kernels are removed about 70% of these nutrients are returned to the soil. Given suitable conditions peanuts can actually do much to build up the fertility of the top soil by re-cycling nutrients from the sub-soil that would otherwise

BLE PORTIONS

N. PU.	Net	Fat. %	Iron(Mg.)	Riboflavin (Mg)
62.7	4.2	0.4	0.3	0.03
54.5	4.3	1.2	1.1	0.05
29.7	7.0	1.3	7.0	0.30
46.8	10.7	1.5	5.4	0.11
61.4	23.3	18.0	6.3	0.30
42.7	10.9	14.4	3.0	0.21
66.9	12.7	13.0	2.3	0.17
79.3	13.0	0.5	0.7	0.08
93.5	11.6	11.7	2.5	0.03

nglish - Speaking Caribbean, CFN1

or Proteins, FAO, 1970

There is thus a considerable gap between the poor quality of nuts presented to the consumer and that which would attract greater consumer acceptance. This improved quality would include clean (sometimes clear-coloured), large kernels and freedom from insects and other damages.

Although flavour is important, it would seem that this is the last criterion which really affects consumer acceptance. Price is already high on the basis indicated above, but this at any rate indicates what the consumer is willing to pay if the quality is acceptable.

4.2.1.2 Peanuts roasted, salted and canned or used in Confectioneries

Peanuts presented in these forms for human consumption are either imported in these forms or are prepared from imported nuts (usually husked). Jamaica Frozen Foods Ltd. is responsible for the bulk of the canned snack food that has proven to be so popular. A portion of the imported husked kernels goes to the Highgate Cocoa Fermentory to be used in the cottage industry for the manufacture of peanut brittle or candy bars.

4.2.1.3 Peanut Butter

This product is also processed from imported kernels by Jamaica Frozen Foods Ltd. The kernels are roasted and ground and mixed with added ingredients to produce peanut butter for which there is a high demand for preparing sandwiches and various recipes. However, peanuts consumed in the above ways, inspite of being popular, do not make a significant contribution to improving the nutritional standard of the country.

4.2.1.4 Peanut Oil

To date Jamaica has not been involved in the production of peanut oil, due to the lack of adequate production. The shelled nut contains over 45% by weight of oil of a very

high quality. This oil is used in the preparation of hydrogenated cooking oil which has a better nutritional rating than oils extracted from cotton seed, coconut, corn or soy bean.

4.2.2 Animal Feed

The peanut oil cake or meal which remains after extraction of the oil is an excellent ingredient for animal feeds, and depending on the methods of extraction or on the objectives of the processors, can also produce an excellent ingredient for human foods (especially baby foods), soaps, etc. The stover, the shell or hull and the meal left after oil extraction, can substitute other oil residues in the preparation of livestock feeds.

4.2.2.1 Peanut stover collected immediately after lifting the plants at harvest has been examined in terms of its utility as an animal feed by the Agricultural Chemistry Division of the Ministry of Agriculture, Jamaica. The results of the analysis varied with the maturity and the amount of drying or leaf-fall as experienced in the field.

There has been no local research on the effect of peanut hay on the growth rate of animals, however, information provided by animal nutritionists indicates that peanut hay is as good as alfalfa hay as an animal feed.

4.2.2.2 The shells or hulls obtained after mechanical shelling of nuts can be ground and mixed with molasses and mineral supplement to provide good quality animal feed. The testa removed from the kernels in blanching is also useful livestock feed ingredient, but its yields per plant are necessarily very low.

4.2.2.3 Oil cake left after the removal of the oil, contains over 50% protein and is often used in formulating concentrate rations for livestock.

4.3 The uses of peanuts in industry are numerous. Roasted peanuts, peanut oil, animal feed (peanut oil meal), soap, detergent, peanut butter and margarine are some of the best known by-products of the peanut industry. What is most important at this stage of development of the peanut industry in Jamaica is to determine those uses which should be given local priority and then plan the production in accordance.

4.4 The specific roles which are of importance at this point in time, and which are likely to be achievable within a medium term are those of providing foods and saving foreign exchange. The latter will also have the concomitant effects of producing oil and oil meal for human food and animal feeds respectively.

4.5 Planning production for processing will depend to some extent on saturating the lucrative local "ball park" market, reducing costs of production through greater efficiencies, and organising producers, probably on a contract basis, for producing peanuts for oil extraction.

5. DEVELOPMENT OF THE PEANUT INDUSTRY IN JAMAICA

5.1 Local Action

In spite of its early introduction into Jamaica, probably dating back to the 18th century the peanut has remained a crop of minor importance, mainly in the hands of small farmers. Official records indicate that little attention has been paid to the research needs of the crop, and indeed there has been relatively little attempts made at promoting the crop to any great extent. Unfortunately, this has been the case although its potential economic importance and suitability for growing under Jamaican conditions have been realised for a long time.

5.1.1 Two aspects of agronomic significance emerge from the Jamaican experience in growing peanuts, namely:

(i) the exceptionally favourable conditions for production

which exist in St. Elizabeth, and (ii) the performance profile of what is now termed the local cultivar - namely, the Valencia seed material.

Over the centuries the Valencia variety, which has become adapted locally, has been grown in most districts of the country in which small farmers operate. The fact that production has become concentrated in St. Elizabeth attests to this parish's ecological advantage over other parts of Jamaica. Furthermore, through a process of natural selection, the type now being cultivated has developed a measure of tolerance or resistance to the local disease complex. However, on the basis of performance, it appears that this variety may have reached its plateau and that steps must be taken to obtain material which is higher yielding, meets requirements for processing and so forth. This implies that appropriate seed testing and multiplication must be undertaken simultaneously with the production programmes.

5.1.2 The 1960's witnessed the first attempt at large scale production of peanuts and this was located at Hounslow, St. Elizabeth. Large quantities of seed material were imported for the purpose but unfortunately proved highly susceptible to the local diseases. Many other features including those relating to inappropriate technical practices were involved, all of which led to most unsatisfactory results, and served as a deterrent to the development of the peanut industry.

5.1.3 A number of ad hoc investigations ensued in which varied resistance to diseases received some attention without regard to other desirable agronomic characteristics. Renewed interest in the crop was showed in the 1970's, and resulted in the Ministry of Agriculture initiating fertiliser trials through the Santa Cruz Area Land Authority, in collaboration with the Regional Field Experiment Programme of the University of the West Indies.

Seed material of the local variety was involved. High yields (2,000 lbs. per acre) obtained from the application of a package of recommended agronomic practices including the placement of high phosphate fertiliser carriers below seed depth at planting were sufficient to fire the imagination and arouse great expectations for its industrial development.

5.1.4 A pilot project was therefore launched at West Albion in St. Thomas, but again insufficient adaptive research information was available to guide the development exercise. Labour intensive methods of harvesting could not cope with large areas established with mechanical seeders. Essential facilities for drying and for storage were not available as a result of financial constraint, and the pilot project was eventually abandoned.

5.1.5 In the traditional peanut growing area, attempts at increased production met with only moderate success. However, the quality of material produced left much to be desired. Poor drying techniques and conditions of storage caused incidents of aflatoxin. The highly variable peanuts collected from numerous scattered small farmers presented problems in blanching to the processors, namely Jamaica Frozen Foods. The question whether difficulties experienced in the removal of the testa or seed coat are varietal or whether they stem from improper post harvest care remains a challenge for future research.

In more recent years, as a result of multi-disciplinary work carried out by CARDI in collaboration with the Ministry of Agriculture, many of the agronomic problems involved in peanut production have been satisfactorily resolved. The solutions are included in the technological package of practices for peanut production in Jamaica.

5.2 The Role of IICA - Jamaica

5.2.1 In 1976 The IICA - Jamaica office was established. Arising from its programme of work, which took into consideration the Government's Policy for agricultural Development, the Allsides Pilot Agricultural Project was initiated. It is jointly financed by the Government of Jamaica and the Simon Bolivar Fund, and started operations in spring of 1977.

5.2.2 The main objective of the Allsides Project is to develop and demonstrate appropriate practices for sound land use and intensive farming on hilly (bench-terraced) lands of Jamaica. This objective is being pursued as part of a strategy for increasing farmers' incomes as well as employment opportunities in rural areas, and ultimately for improving the standards of living for rural people.

5.2.3 The project includes a soil conservation component predicated on bench terracing. Closely associated with the protection of soil against accelerated man-made erosion are improved cropping systems. These have been investigated and demonstrated with a view to increasing farm incomes and eventually the benefits which usually derive therefrom.

5.2.4 During the early stages of the demonstrations it became apparent that the peanut is a crop which performs well under the conditions of soil and climate which obtain at Allsides, and that given proper management and the adoption of appropriate technological practices the inclusion of peanut as an intercrop for yams (2 crops - fall and spring) has considerable economic potential.

5.2.5 In IICA - Jamaica publication No. 111-7 titled "Production and Marketing of Peanuts" evidence was presented to support the research findings of the GOJ/IICA Allsides Project in relation to the profitable production of peanuts grown on selected hilly lands of Jamaica, which

meet the requirements for soil and water among other factors.

In publication No. IV-3 titled "Response of Peanut (Arachis hypogaea L.) to Nitrogen, Minor Elements and Phosphorus on a Newly Terraced Ultisol in Jamaica" technical information was obtained for the production of peanuts on terraced lands. The information resulting from the experimentation indicated that on a newly terraced ultisol level of nitrogen application should not exceed 10kg/ha (9lb/acre)/crop for satisfactory peanut yield.

In addition soil organic matter and pH (soil reaction) should be ameliorated prior to crop establishment. While there is a response to fertiliser application, rational fertiliser application is a prerequisite for obtaining satisfactory yields. The experimental results further indicated that there are gaps in the technology for peanut production which can only be resolved by constant recourse to appropriate adaptive research. (See also Section 5.1.1.)

5.2.6 On the basis of the experimental results and commercial trials carried out at Allsides and taking into consideration yields that are obtainable in the Allsides area, conservative yields likely under these conditions are of the order of 1,200 lb per acre of unshelled nuts.

Experiments conducted at Allsides resulted in yield of 2,200 lb per acre for spring crops and a much smaller yield for the fall crop, due to the crop mixes and the plant population used. Elsewhere yields ranging up to 2,000 lb per acre have been obtained from MINAG and CARDI investigational work. Although the suggested yield figure of 1,200 lb (not static by any means, since it is expected that this will increase as farmers gain experience

in applying improved techniques) is below the obtainable potential under irrigated conditions, it is just slightly greater than the existing average annual yields of 1,100 lb. per acre.

As yields increase under efficient and improved production practices there will be scope for reducing the unit price of unshelled peanuts. This in the first instance may create resistance from farmers in terms of their expectations for higher unit prices. It must be recognized, however, that the current prices are based on relatively inefficient production. Additionally it can be satisfactorily demonstrated to farmers that their income profile can be improved significantly, other things being equal.

5.2.7 The reduction in unit costs brings the supply of peanuts within the price ranges which will be attractive to processors, particularly for oil extraction. This means that all involved in the industry, producers and consumers alike will benefit from an improved peanut industry.

5.2.8 A very important exercise which must be undertaken in any feasibility study involving the use of peanuts for oil production is the determination of the value of the peanut oil meal produced. It should also take into consideration the potentially high price for peanut oil on world markets, vis-a-vis the price paid for other vegetable oils imported, as well as the trade-off effects which can be obtained. A most important consideration should be that of using a part of this trade-off for financing certain aspects of the expansion of the local peanut industry.

5.3 Production Levels

Peanut Yields per acre vary considerably with systems of production making it difficult to estimate unit costs with any degree of accuracy. Full scale trials carried out by

CARDI using plots of over an acre in size have demonstrated that yields ranging from 2,000 to 3,000 lbs. of unshelled pods (17% mousture) per acre can be obtained under the conditions applied.

5.3.1 In field trials for peanuts carried out at Cocoa Walk, Manchester, on bauxite soils, under rainfed conditions, complete fertiliser mixtures (NPK) placed just below the depth of seed at planting resulted in an increase which was as much as 1,000 lbs. per acre, or double that of the control plots. The levels of increase obtained were found to vary with previous levels of fertiliser applications but this does not necessarily, ipse facto, result in increased production. Indeed at Hounslow, on the Newel Clay Loam, on a site that had benefitted from previous additions of fertiliser at the time of planting increases were only marginal.

The level of yields under irrigation were similar to that obtained under rainfed conditions. These observations are inconclusive since the effects of such variables as the level of water management (for irrigated farming) and the amount of rainfall during the growing period must be reconciled. Under the particular conditions under which the trials were undertaken moisture was not found to be a limiting factor. In general, however, the observation is that under improved water management it is possible with irrigation to ensure production levels of 2,000 lbs. per acre, whereas under rainfed conditions yields have tended to fluctuate drastically, and on average to be usually only about one-half of those obtained under irrigated conditions.

5.3.2 Although it was not possible during the course of the trials to separate the response of fertiliser from that of moisture, these factors together were apparently associated with increases of the order of

1,000 lbs. per acre above the yield levels obtained by most small farmers. Furthermore, stand counts indicate that an increase of 20% can be obtained from improved Valencia seed material used in these trials at recommended spacing of 4 inches apart in rows at 18-inch intervals giving a population of 87,000 plants per acre.

5.3.3 Work done on small plots has shown that yield levels of over 3,000 lbs. per acre are achievable with proper implementation of the technological pack developed for this crop. Given the extent of research which has been carried out on this crop and the favourable results obtained in many other places there is an increasing necessity for conducting adaptive research for determining cause and effects under local conditions.

5.3.4 The Need for Changing Harvesting Practices

Traditionally, peanut harvesting in Jamaica involves three distinct operations, namely; (i) lifting; (ii) windrowing; and (iii) handpicking the pods off the drier plants.

Several disadvantages are associated with windrowing. First of all, windrowing involves placing the plants in an inverted position to allow drying out for 3 - 6 days. Although some advantage is to be derived from the pods "maturing out", exposure to the vagaries of the weather increases the incidence of Aspergillus flavus, the causative organism of Aflatoxin development in storage.

Secondly, the drying period involved leads to the dropping off of nuts which either results in a lower recovery or in an increase in the tedious nature of the operation. Furthermore, on drying the protein content of the stover declines from over 10% to less than 5% in the dry hay. This deterioration in the value as a live-stock feed is quite significant as over 2 tons of hay per acre are usually involved.

Mechanised methods of lifting mature plants and threshing make it possible to complete harvesting operations very quickly. Only a few days of bright sunshine are necessary for an efficient take-off of the crop.

5.4 Farming Systems

For the most part peanut is a crop which has been grown by small farmers. The best results have been obtained by producers in southern St. Elizabeth and southern Manchester.

5.4.1 Sizes of farms vary from 5 to 10 acres on which peanuts occupy from 1 to 3 acres. Production is carried out under rainfed conditions. Farmers sometimes produce two crops per calendar year, sometimes on the same plot of land. (The farmers produce their own seeds and they obtain yields which give an average of 1,100 lbs. peanuts per acre (1979). On a quarterly basis this ranged from 950 lb. to 1,350 lb. per acre. Land preparation is usually mechanical but all other operations are manual. There are also smaller farms which are producing peanuts under the same conditions as those mentioned in Section 5.4.1. These farms are 1 to 3 acres and they produce on average between 0.3 to 1.0 acres of peanuts annually. As is the case for the larger farms, the land used for peanuts under these conditions is usually that which can be prepared mechanically.

5.4.2 Small peanut farms are found in other areas of St. Elizabeth in the Barton Isle and Lacovia areas. Two crops are possible on an annual basis. Land is also mechanically cultivated. Within this same geographical area, however, on the plains of Hounslow and at Newell - in the Pedro Plains - it is possible to produce peanuts under irrigated conditions. The average size of these irrigated farms is 5 acres and farmers produce on average at least 1 acre of peanuts per crop.

5.4.3 Farmers normally produce their own planting material. In 1979 yield on a country basis was 1,100 lb. per acre. On a quarterly basis this ranged from 950 lb. to 1,350 lb. per acre. Clearly some farmers obtain yields much above these average figures, which indicates the further potential for increasing production.

5.4.4 Larger demonstration plots have been tried under irrigated conditions on flat lands at Albion in St. Thomas and Caymanas (Cow Park) in St. Catherine. In the case of St. Thomas a plot of 52 acres has been used for the production of peanuts on a commercial type operation. At Cow Park (Caymanas Estates) a 7 acre plot has been used. In both instances the indications are that yields of near 2,000 lb. unshelled peanuts per acre are obtainable and also that it is possible to produce two crops per annum. Additionally, the results indicate the effects due to economies of scale which can be achieved as a consequence of using larger plots for peanut production. Control of moisture and the use of mechanical operations are other factors which make these projects feasible. However, it is possible to contemplate a judicious mix of mechanical and manual operations which would lead to production costs which are acceptable to both producers and processors.

5.4.5 The systems or production practices inherent in those listed in sub-sections 5.4.1 and 5.4.2 can be replicated on lands which are similarly located. The developmental effort essentially must endeavour to make production more effective by traditional peanut producers, while at the same time extending production to new farms and to new operators who adopt similar practices.

5.4.6 Peanuts intercropped with yams in the yam growing area of Trelawny (and as clearly demonstrated in the Allsides Project) not only increase farm income but also lead to the production of peanuts at a cost low enough for use in processing. With continuing refinement of this work it should be possible to obtain yields of at least 1,200 lb. of unshelled peanuts per acre under those conditions.

5.4.7 Intercropping Sugar Cane with Legumes

Economic pressures due to low foreign exchange earnings together with the necessity to use available land more intensively have resulted in the Sugar Industry Research Institute (SIRI) having a detailed look on the use profile of sugar cane land. Since the land used for sugar cane is likely to provide, in the long run, most of the land for peanuts it is reasonable to provide some background information on this aspect.

In this context the 150,000 acres of land used by the sugar cane industry represents the best agricultural land of the country. Admittedly, while flatness of the land, and its fertility are advantageous factors, there are some disadvantageous ones such as salinity, stiffness, and shortage of water for irrigation in some instances.

Sugar cane land is suitable for the local production of almost all the major crops (for local use as well as for export) and so it is understandable why most crops are competing for this land. The Sugar Industry Research Institute (SIRI) in re-assessing its use of land has become involved in certain aspects of legume investigations which could result in land being made available for meeting a part of the country's legume requirements. These investigations inter alia include:

(i) studies of intercropping systems involving legumes and sugar cane;

(ii) determination of the feasibility of producing

pure stand legumes in situations otherwise unsuitable for the production of sugar cane.

The main studies, however, have been confined to (i), that is, the intercropping of sugar cane with legumes. The fact that sugar cane is planted 5 feet to 5.5 feet between rows indicates that until the canopy covers the inter-row area there is an opportunity for growing certain early maturing crops.

Historically speaking during the 1930's and 1940's when much of the work on the sugar cane farms was still being done by hand a measure of intercropping was undertaken. This disappeared with the advent of mechanized agriculture. During the period 1976 - 77 some sugar estates tried semi-mechanized intercropping of cow peas and red kidney beans with only a modicum of success. The problems which occurred at that time were due to:

(i) inadequate information containing the technology necessary for successful intercropping; and

(ii) the rapid rate at which the interspaces were covered by the canopy leaving inadequate time for the development of the intercrop.

Experimentation

The development of intercropping systems for sugar cane and legumes is being jointly researched by SIRI and the Caribbean Agricultural Research and Development Institute (CARDI), assisted by the Ministry of Agriculture. The legume crops being investigated are cow peas and black-enge pea varieties, peanuts, red kidney beans and mung beans. Currently, investigations are being carried out on the Vigna spp, Phaseolus spp and the peanut.

The SIRI reports that weed control is a major problem in developing intercrops and experimental work on this aspect is proceeding. The original objective of the SIRI was to broaden the base for providing the protein needs of the country. At this point in time, therefore, it is evident that the objective itself should be broadened to take into consideration meeting the country's requirements for edible oils and ingredients for animal feeds. Indeed one could even be apprehensive that without the re-statement of the objective peanut could be more disadvantageously placed vis-a-vis other legumes.

Potential Land Area Available for Intercropping

The SIRI reckons that each year approximately 15,000 acres of sugar cane is replanted. Not all this land would be available for legumes and in the case of peanuts and other legumes such limiting factors as

(i) heavy texture
(ii) salinity
(iii) poor drainage
(iv) possibility of heavy rains at harvest time

must be considered. The SIRI further reckons that about 40% of the cane land available for replanting each year could be used for legumes.

5.5 Description of Problems

There are many problems which currently beset the peanut industry, and these will have to be satisfactorily redressed if the industry is to be expanded. The problems vary with the kinds of farming systems but in broad terms they relate mainly to the following:

(i) Technological considerations including the appropriate cultural practices to be applied.

(ii) Inadequate quantities and varieties of seeds as well as poor quality of seeds.

(iii) Inadequate storage facilities.

(iv) Unavailability of land in particular, and other inputs in general.

(v) The peanut as a commercial crop has not been accorded the importance which is commensurate with its usefulness and its potential.

5.5.1 Numerous constraints to exparded peanut production and productivity have been identified as a result of extensive on-farm investigations carried out mainly during the period 1972 - 1975. Major problem areas which need to be given priority attention in combatting obstacles to achieving the potential development of the peanut industry are discussed in the sections which follow. In this context emphasis is placed on production for agro-industrial purposes, specifically for the processed food market and also for the extraction of peanut oil.

5.5.2 Technological Considerations

Improvement in the application of determined practices can lead to a considerable increase in present yields per acre. In some instances additional inputs will be involved but the indications are that the extra yields obtained will more than compensate for the added costs. The technological package which has been prepared and which is attached as Appendix of this presentation sets out all the elements considered desirable for successful peanut production.

5.5.3 Planting Material

The main problems which are associated with this important subject of providing adequate and suitable planting material in all its aspects are discussed in the sub-sections which follow.

Varietal trials have shown that the yields potential of the local cultivars is relatively high, however, it is widely believed that the genetic potential has deteriorated and that there is the necessity to infuse new vigour into the germ plasm. Non-availability of supply and poor quality of seed planting material retained from previous reapings are two of the main factors which affect production of peanuts, for the following reasons:

(i) Immaturity of Seeds

Judging the optimal period of harvest for maximum recovery of mature nuts is difficult in spite of the characteristic interior speckling of shells as a sign of maturity in the Valencia. This combined with the fact that praedial larceny is a scourge which inhibits agricultural production causes many small farmers to take off their crop somewhat prematurely.

(ii) Windrowing

The standard practice of windrowing in which the pods are exposed to the vagaries of the weather are associated with increased incidence of Aspergillus infestation, the causative organism of Aflatoxin development in storage.

(iii) Drying and Selection Procedures

Lack of drying facilities in the form of either a barbecue or a tarpaulin for effective sun-drying under clean conditions, combined with a general disregard for selection and grading, result in very variable material being placed in crocus bags and other containers for storage for planting.

(iv) Storage Facilities

Many small farmers have no store room facilities whatsoever. Cases are known in which farmers store peanuts under their beds for safe keeping.

(v) The Higgler's Role

Temptation to dispose of some of the seed material retained for planting the next crop is very great, since the higglers pay a relatively lucrative price - $15 per bushel (20 lbs.) for unshelled nuts, which can be disposed of at still higher prices on the fresh market. This results in insufficient material being retained for establishing all of even the small areas available for planting. This means that as a strategy for development particular care needs to be exercised to procure and save seeds for planting subsequent crops.

(vi) Seed Quality

Several examinations of seed material retained by farmers for planting have established the fact that seed quality is poor and variable. Cracked pods, shrivels and even "pops" have escaped attention since all this material has ready sale for the unsuspecting customer. As a result, the shelling percentage usually varies from 50% - 60% compared with 70% - 75% for properly selected nuts. Shelling reveals a variable portion of small and/or mouldy kernels, which on occasion have amounted to as great as 30%. Germination tests have given results ranging from 65% - 95%.

Although the small farmers have recognised some of the deficiences which arise from using seed which they have saved for planting and usually practice some kernel selection, the extent of rejection of poor seed is low at this stage, as only the more obviously defective kernels are culled so as to retain as much as possible for planting. In the final analysis this is false economy since germination rates and seedling development are considerably affected.

(vii) Suitability of Local Varieties for Different Uses

An expansion of the industry to include processing for oil must take fully into consideration the determination of varieties which will combine factors of high yields, high oil contents and resistance to disease and pests, inter alia. The second requirement is the provision of facilities for producing seed material of a high genetic potential on a continuing basis.

5.6 Solution of Problems

Problems and their solutions will vary with farm sizes. For example, small farming systems involved in peanut production have a number of advantages over large farming systems where seed quality and variability are concerned. Hand-picking of peanuts from the plant followed by hand-shelling and planting combine to achieve high stand counts in the field, provided operations are correctly timed and other conditions relating to successful peanut culture are met. On the other hand, large farm operations involving mechanical threshing, shelling and planting result in seeds being broken. This may be a factor which is also associated with the particular variety being used.

5.6.1 Improving Seed Quality

It is convenient to discuss the requirements for improving seed quality under three headings, namely: (i) Before Storage; (ii) During Storage; and (iii) After Storage.

(i) Before Storage

Seeds for planting need to be carefully selected prior to storing. This may involve the demarcating of areas of the plant crop for this specific purpose. After reaping the best seed should then be selected based on pods alone, as a prelude to pod selection after storage. Early selection of choice nuts and separate drying for seed purposes will reduce problems associated with bulk drying, especially

where the farmer is handling a large crop.

(ii) During Storage

Material selected for seed should be stored separately, thereby avoiding problems which are associated with bulk storage, especially due to poor ventilation. Storage in the shell under proper surrounding conditions can be successful. The requirements for small scale planting will be less stringent than those for large scale operations, but the basic principles must be adhered to. For very large operations store rooms having appropriate ventilation must be provided.

(iii) After Storage

Shelling of nuts is best carried out just prior to planting. Kernel selection should entail not only removal of those affected by mould growth and otherwise damaged, but also separation of medium and large kernels from small kernels which do not have enough food for best performance.

Seeds should be treated with suitable fungicides. Most fungicides are reported to be toxic to the Rhizobium bacteria responsible for nodulation and symbiotic fixation of atmospheric nitrogen. To date, Orthocide (50% captan) has been used without observable adverse effects. The attainment of desirable results from pesticidal treatment depends on the method to be used in crop establishment.

Where mechanised planting is to be practiced on large farms pesticidal treatment of seed does not create a health hazard. However, on small farms where hand sowing is the general practice the farmer is well advised to use pesticides to a minimum extent only.

To date a fairly high level of germination has been obtained without this measure and there has been no need to inoculate the soil or seed with Rhizobium cultures.

5.6.2 Priority for Providing Good Seed Material

There exists a shortage of good seed even for the limited production programmes now being pursued. The demand for seed on an acreage basis will also be greater, in order to increase plant population per acre and thereby yields per acre. Any expanded peanut programme must be predicated on the availability of suitable seeds. The two main issues which arise relate to quality and quantity.

In the short run it appears that the Valencia variety will be suitable if treated appropriately. Tests with other varieties over the longer-run should be pursued. In the meantime, however, it will be necessary to bulk local seed of proven performance specifically for the expansion programme.

In the short run farmers will have to continue to provide their own planting material, and to improve on their methods of selecting and storing these for replanting. Another and perhaps the better strategy, is the establishment of seed farms along commercial lines, to produce seeds for production programmes, particularly in view of the fact that small farmers are unlikely to be able to do a very good job of providing seeds for the level of production envisaged.

5.6.3 Factors Affecting Seed Supply

(i) The small farmer usually does not produce enough peanuts to enable him to provide his own seed, and the higgler competes for such seed as he has available.

(ii) The quality of the seed needs to be improved by better selection and storage practices.

(iii) Uncertainty of supply of seeds at the optimum time(s) for planting.

(iv) Inadequacy of storage facilities.

(v) Little or no testing of seed viability prior to planting.

(vi) Necessity for specific determination of the variety or varieties of peanuts which will be required, so that appropriate arrangements may be made to acquire them on a timely basis.

All these factors are subject to the ability to finance the various expenditures involved.

5.7 Land Availability

At present, data available from the Ministry of Agriculture's Data Bank and Evaluation Division indicate that approximately 6,000 acres of land are being used for the production of peanuts. Peanut farmers are seeking an improvement and expansion of the industry. On the assumption that proper incentives and arrangements can be worked out, it is envisaged that the production of peanuts can be increased by:

(i) More efficient methods of production leading to increased yields per acre;

(ii) The production of both a spring crop and a fall crop on some farms;

(iii) Increasing the production on land similar to that now used for producing peanuts;

(iv) Including peanuts in mixed cropping systems designed to use hillside lands more intensively, employing sound land-use techniques; and

(v) Using selected areas of sugar cane lands prior to their being replanted in sugar cane after several years of ratooning.

6. DEMAND FOR PEANUTS AND PEANUT PRODUCTS

6.1 Existing Demand

The major uses of peanuts in Jamaica are as roasted unshelled nuts for the "Ball Park" business, and for the manufacture of peanut brittle, confectioneries and canned salted nuts (cocktail) using shelled nuts (i.e. with the shell removed). Quantities of shelled but otherwise largely untreated nuts are used for direct consumption. Jamaica imports "cocktail" peanuts in tins from Trinidad, and unshelled nuts from other countries, mainly the U.S.A. and a number of Latin American countries. About 10% of the production is retained for seed material.

6.1.1 Local production over the years has been inadequate to meet local demand, resulting in the importation of relatively large quantities of peanuts. Within recent years restrictive import policies due to depressed foreign exchange earnings have led to a significant reduction in the quantities imported. This, however, has been associated with an upsurge in local production.

6.1.2 Although there has been an identified demand for peanuts for processing, controversies between processing interests, farmers and policy-makers in relation to the importation of peanuts for processing failed to bring about increased local production to meet producers' demands.

The resistance to the use of local peanuts was ostensibly due to factors concerned with quality, freedom from disease (in this case mainly the aflatoxin mould) and seasonality of supply of the local product. There was also the age-old belief that anything produced locally is always inferior to what is imported. The fact that little was done to improve local quality which in this instance was inferior, but now improving, did little to reduce the dependence on imports.

In addition, processors were afraid of dust and related problems of contamination associated with the use of locally produced peanuts in shells. The fact is that processors wished to avoid the problems associated with shelling peanuts. However, a major reason was the lower price of imported peanuts as compared with that of the local product. There are two distinct markets for peanuts, one for "raw" nuts and the other for processed products.

6.1.3 At present the local demand for peanuts is restricted to that quantity which can be obtained from local production in addition to that which can be obtained from the limited imports allowable given the constraints set by low foreign exchange earnings. In this situation the demand for,and the supply of peanuts are identical.

6.1.4 Part of the demand for imported nuts relates to the provision of raw material to be processed. The current demand for traditional uses is significantly lower than the potential demand. Unfortunately, however, this demand has not yet been able to create the "pulls" necessary to increase local production. In addition, the demand for uses other than for processing does not adequately reflect the price factor for peanuts. Nevertheless there seems to be little doubt that Jamaicans would consume larger quantities of peanuts if available, at present even high prices. This position will only be changed when supply is increased considerably and the quality of the product is improved. Peanuts for local requirements are provided as follows:

(i) Local production - unshelled

(ii) Imported - shell removed

(iii) Imported - canned

6.1.5 Where peanut products are concerned, the reference is specifically to peanut butter, peanut oil, peanut oil meal and fabricated products such as soups and baby foods which contain nutritious food elements derived from the peanut. The quantities actually imported may not be large at the moment but there is considerable scope for substitution of similar imported vegetable oil by-products. This is especially the case where the importation of ingredients for poultry and pig rations are concerned. It is evident that the derived demand for peanuts for making these products should be very high.

6.1.6 A study of the demand for peanuts for its various uses requires an identification of the quantities and the prices paid for peanuts for these uses. At present appropriate information is very limited and one must, therefore, use a naive or simplistic approach.

6.2 The local availability of peanuts for all present uses is under 8 million pounds unshelled nuts. A part of the peanuts imported is processed - mainly canned. Another part is raw unshelled. Annual availability for the last 9 years is presented in the Table which follows.

TABLE3 - PEANUT, PRODUCTION AND IMPORTS OF PEANUTS 1971 - 1979

('000 lbs. UNSHELLED)

YEAR	LOCAL PRODUCTION	IMPORTS *1	TOTAL
1971	1,272	8	1,280
1972	1,083	146	1,220
1973	1,192	2,150	3,342
1974	1,524	1,424	2,948
1975	1,160	2,002	3,162
1976	1,020	1,746	2,766
1977	4,066	288	4,354
1978	4,532	601	5,133
1979	5,540	715	6,255

Source: Data Bank Division MINAG, and Processors Records Jamaica, 1980

Import data presented in shelled nuts converted on basis of 70% shell-out of whole nuts

6.2.1 The above statistics indicate that local production of peanuts has been increasing rapidly. Over the last three years the volume of imports has been decreasing, and additionally, the total volume of peanuts available for local use has been increasing.

TABLE 4: IMPORT STATISTICS FOR PEANUTS, JAMAICA, 1976 - 1978

YEAR	SOURCE	QUANTITY (lb.)	VALUE $ c.i.f.	UNIT VALUE Per Lb. ($)

6.2.2 In 1979 the single largest user of peanuts purchased locally grown peanuts at $14 per bushel (20 lbs.) or $0.70 per lb.

Transportation and shelling costs	0.36
	$ 1.06 per lb. at plant site

By comparison he obtained imported peanuts

"	"	(origin Brazil)	$ 0.68 (shelled)
"	"	(origin Argentina)	$ 0.69 "
"	"	(origin U.S.A.)	$0.54 "

These data indicate that shelled peanuts from Latin American sources cost about 70¢ per lb., and that locally produced peanuts (also shelled) cost about 50% more at plant site than imported nuts. The statistics indicate that imported peanuts from the USA cost less than those from other ountries. Although unshelled peanuts are bought by the local plant for approximately 70¢ per lb., the retail outlets such as the supermarkets purchase raw unshelled nuts and are selling this product to consumers at $2 per lb.

6.2.3 Assuming a 65% extraction rate (of shelled from unshelled) for locally produced peanuts:

1 lb. unshelled = 10.4 oz. shelled

on a basis of $2 per lb. this gives a cost of 19¢ per ounce without taking shelling costs into consideration.

- 6 oz.packages of shelled peanuts retail (in supermarkets) at $2.40 or 40¢ per ounce.
- A can of Planter's Peanuts (6 oz net weight) retails for $2.20, i.e. 37¢ per oz. for fried beans with testa removed and salt added.
- One can of Jamaica Way Peanuts (6 oz.net weight) retails for $2.40, i.e. 40¢ per ounce (price of can should be taken into consideration).

- Roasted peanuts in husk currently sell for an average of $2.40 per lb. in the so called "Ball Park" business, and in many instances a significant portion of this is not suitable for consumption.

6.2.4 The main conclusions to be drawn are:

(i) The sizeable demand which exists for peanuts to be used in the traditional way for roasting and selling in very small packages, implies that this is a very lucrative business.

(ii) A knowledge of the operations involved in (i) implies that greater efficiences and product improvement would lead to a greater coverage of any given quantity of peanuts.

(iii) Although the price of the local product is relatively high, there is little doubt that consumers would eat more peanuts in the "ball park" business if more peanuts were available, and if the quality were better.

(iv) There is a potentially large derived demand for peanuts for the production of oil, cattle feeds and human foods.

(v) The price per unit of locally produced peanuts is significantly higher than that of imported peanuts.

Other factors which are known to affect the above considerations and influence the demand for locally produced peanuts relate to:

(a) Low yields per acre, due to levels of cultural practices.

(b) Poorer quality of local nuts supplied for processing.

(c) Relatively high handling costs (from farm gate unshelled to factory shelled).

(d) Existing processors of peanuts do not have facilities for shelling nuts and in any event have indicated an unwillingness to undertake shelling.

(e) Potential processors will undertake shelling since they indicate that they also wish to produce animal feed ingredients.

6.3 Medium Term Demands

These will depend largely on the purposes for which peanut will be used locally, the price at which it can be produced, and more importantly the volume of local production and the efficiency of production. The existing lucrative but unfilled fresh market will take sometime to reach its zenith, especially if there is an improvement in the quality of the nuts. Local production potentials must determine availability of supply. Foreign exchange considerations will create further pressures for increasing local production.

6.3.1 In the medium term production costs should approach those expected from more efficient and effective production. This is likely to be the case even if there is a resistance by farmers to reducing their prices by keeping production down. But this is obviously not sound economics. When the demand for peanuts at this level will be available for other uses. At this stage a threshold should be reached. Alternatively or on a complementary basis specific programmes should be initiated for contract production of peanuts for oil extraction.

6.3.2 Jamaica imports large quantities of animal feed ingredients specifically for poultry and pigs - these animals requiring feeds having a high Total Digestible Nutrient (T.D.N.) content. These feeds include maize

as the main component together with meals from soy bean, and other oil seeds. Additionally, Jamaica is importing large quantities of vegetable oils. Both the oil meals and the oils can be substituted by peanuts and peanut oil meal respectively. Thus the potential and real demand for peanuts and peanut products can be measured by the existing demand for some of these other substitutes. In order to obtain these supplies specific production programmes must be implemented which take into consideration quantities which will be demanded, the quality, prices and seasonality.

6.3.3 One processing company has indicated that it can use "unlimited" quantities of peanuts for processing into oil and oil meal, provided that the price of the nuts (shelled) is of the order of 40¢ - 45¢ per lb. A minimum requirement for feasible processing operations has been set at batches of 50 tons per batch provided for processing. Given the fact that such a demand could become a reality, the main task is that of providing enough peanuts at an agreed price which will be feasible for farmers and processors.

6.3.4 Contractual arrangements will be necessary to satisfy such a demand in the short run, since there still exists a large unfilled demand in the higher priced market which exists for "raw" peanuts.

6.3.5 Any plans for meeting a potential demand which departs from traditional peanut usage in Jamaica will depend largely on the judicious phasing of local production of peanuts. This is due to the fact that there already exists a large unfilled demand (real and derived) for raw peanuts, as well as 'adequate' processing capacity. This demand which essentially is an artificial rather than a real demand may be categorized as follows:

(i) Demand for peanuts for exploiting the "ball park" market, i.e. for roasting in the shell for sale by peanut vendors in ball parks.

(ii) Demand for peanuts to satisfy a growing market for shelled peanuts, (in the testa but not otherwise processed) for the local processing trade to be used for making peanut-better, confectioneries and canned nuts.

(iii) Peanuts for oil extraction at say 200 tons per annum on a trial basis is a reasonable target, but larger quantities could be tested since factory facilities are already available and there is a sizeable demand for vegetable oils for cooking purposes and for the manufacture of margarine, ingredients for which are largely being supplied from imported products.

(iv) A by-product of (iii) above is the oil meal which will be provided.

6.3.6 Using 50-ton lots of unshelled peanuts the following is the break-down of products which may be expected, on the assumption that unshelled nuts give 70% shelled nuts, and that the chemical composition is as set out below.

	%	Extract from 35 tons shelled nuts (TONS)
Oil	43.0	15.05
Carbohydrates	23.0	8.05
Protein	25.6	8.96
Fibre	3.4	1.19
Water	5.0	1.75
	100 .0	35.00

50 tons unshelled nuts will produce:

35 tons shelled peanuts
15 tons husks (which can be used as low grade, but very useful ingredient for the manufacture of livestock feed)

35 tons shelled nuts will produce:

15 tons peanut oil
18 tons animal feed ingredients of high grade

6.4 Long Term

A long term in this context can be regarded as three years and longer, this being the period by which there can be greater relizations of actions required for improving any defects in the structure of the organisation for the expanded industry and ensuring increased production.

6.4.1 The marketing of the products inclusive of providing appropriate pricing mechanisms will be examined on a continuing basis. Arrangements should be made for a structured export programme. In spite of the overall policy for removing subsidies, especially when they have to be financed from Government's funds, it is suggested that profits gained from the trading in vegetable oils (value of exports of peanut oils less the value equivalent of the substituted oil imported) be used partly to subsidise the production of peanuts for processing.

6.5 Jamaican Demand for Peanuts and Peanut Products

6.5.1 The current local demand for peanuts is a small one in relation to potential demand. The magnitude of the potential demand is conditioned by such factors as population changes, people's eating habits and their purchasing power, as well as the availability of supplies and of substitutes. The demand (1979) as shown in Table 1 page 37 was 6.3 million lbs. unshelled peanut equivalent.

(1) Approximately 5.6 million lbs. produced locally (unshelled)

(2) Approximately 0.7 million lbs. (imported unshelled equivalent of raw, shelled and canned peanuts of raw, shelled and canned peanuts)

6.3 million lbs. (unshelled)

say 6.5 million lsbs. unshelled nuts.

Adjustments for constraints and other factors would make this about 8 million lbs.

6.5.2 Local production has increased sufficiently to replace a part of imports. Manufacture (and possibly consumers as well) have displayed a preference for imported peanuts largely due to price and quality considerations. These two factors alone can significantly modify the quantity demanded by consumers. The price factor can and must be adjusted locally by more efficient production. Quality improvement in this situation is not an insurmountable task.

6.5.3 During the short run the demand for peanuts and peanut products will be determined largely by the magnitude of local production. In addition, other aspects, especially those concerned with factor inputs, their availability and constraints due to lack of foreign exchange, make it imperative that consideration be given to products such as oil and oil meals as inputs for animal feeds and raw materials for making soups, margarine, soaps, etc.

6.5.4 The two largest processors in Jamaica have indicated that they could handle a total of about 21,000 tons of unshelled peanuts made up as follows:

(i)	Oil, animal feeds and related by-products	20,000 tons
(ii)	Canning, salting, manufacture of peanut-butter, etc.	1,000 tons
		21,000 tons

The "potential" demand taking into consideration the traditional local demand for the fresh market of say 4,000 short tons would be of the order of 30,000 tons of unshelled peanuts; since it will be necessary to make provision for seed materials. The oil processors indicate that they can provide viable operations using 50 ton lots of peanuts.

The demand of 30,000 tons would include nuts for:

(i) All existing (traditional) uses (inclusive of projected annual increases)

(ii) Oil production (this can be used to replace part of the imported cooking oil, either on an in-kind basis or on a basis which would allow a profitable trade-off in terms of earning foreign exchange). The projected quantities which could be made available range from 600 tons in the first year to 20,000 in the fifth (Table7);

Arising from (ii) a significant portion of the raw material ingredients necessary for livestock feeds especially for poultry, pigs and cattle will be made available (See paragraph 6.3.6)

6.5.5 The seeming but challenging enormity of this situation, however, lies in the acreage requirements for meeting this projected potential demand. On the basis of a programme in which one crop per year of peanuts is produced and assuming yields ranging from 1,200 lbs. to 1,800 lbs. unshelled peanuts per acre, the land requirement would lie between 28,600 acres and 43,000 acres. The expansion programme, therefore, must be predicated on the ability to find adequate acreage of suitable land as well as capable producers.

6.5.6 Under conditions of existing land use and availability, a production target of 30,000 tons could be regarded as being unrealistic. However, the acreage for meeting this target can be obtained if proper incentives are provided. One proposal for obtaining land for the suggested expansion programme is based on the following strategy over a 5-year period (See Tables 5, 6 and 7):

(i)	Land already used for peanut production		6,000
(ii)	Similar (new) lands which could be so used	2,500	15,500
(iii)	Land producing 2 crops peanuts per annum		3,500
(iv)	Lands which are likely to be used in mixed cropping systems which include peanuts - on the pattern of the Allsides project	200	2,000
(v)	Mined-out bauxite lands (conservative estimate)		1,500
(vi)	Appropriate sugarcane land prior to the replanting of ratoon canes. The industry replants about 15,000 acres annually. Attempts should be made to obtain at least 8,000 acres for the production of peanuts.	2,000	8,000

6.5.7 On these assumptions, the phasing of land into a peanut programme as shown in Table 5 should be a distinct possibility. On the basis of the projected acreages which could be made available for the production of peanuts, it is expected that in addition to satisfying the local demand for nuts in the "ball park" market and for traditional processing as practiced in Jamaica it should be possible with careful planning and organisation

to produce peanuts to satisfy a sizeable portion of the potential demand for new usages in Jamaica. Sensitising the data presented in Table 7 even down to a level of 25% of the production levels projected, the indications are that it should be possible to meet the demand for a considerably greater quantity of peanuts than is presently available, thereby providing raw material for producing peanut oil, animal feeds and human foods.

TABLE 5: Acreage Expectations for Peanuts Over a 5-Year Period

LAND DESCRIPTION	Y E A R				
	1st	2nd	3rd	4th	5th
	(acs.)	(acs.)	(acs.)	(acs.)	(acs.)
1. Land already used for peanuts (a)	6,000	8,500	11,500	14,500	18,000
two crops of peanuts (b)		1,600	2,300	2,900	3,500
2. Similar types of land which could be so used (c)	2,500	3,000	3,000	3,500	3,500
3. Mined-out land (Bauxite)	500	750	1,000	1,250	1,500
4. Land mixed cropped - intensive hillside					

TABLE 6: ESTIMATED ACREAGE AND YIELDS PER ACRE OF PEANUTS FOR AN EXPANDED INDUSTRY

Source of Land	Year 1		Year 2		Year 3		Year 4		Year 5	
	Acreage	Yield	Acreage	Yield	Acreage	Yield	Acreage	Yield	Acreage	Yield
1. Land already in peanuts (single cropped)	6,000	900	8,500	1,200	11,500	1,500	14,500	1,750	18,000	1,750
2. Land from (1) giving more than one crop per annum	-	-	1,600	900	2,300	1,200	2,900	1,200	3,500	1,500
3. Land similar to (1) (new planting)	2,500	750	3,000	750	3,000	900	3,500	1,200	3,500	1,200
4. Mined-out	500	750	750	900	1,000	1,200	1,250	1,500	1,500	1,750
5. Hillside land-mixed cropping (eg.Allsides)	200	900	500	1,000	1,000	1,100	1,500	1,200	2,000	1,200
6. Sugarcane land before replanting	2,000	1,200	6,000	1,500	6,000	1,800	8,000	1,800	8,000	1,800
TOTAL:	11,200	-	20,350	-	24,800	-	31,650	-	36,500	-

TABLE 7 - PROJECTED LOCAL PRODUCTION OF PEANUTS FOR EXPANDED INDUSTRY (PRODUCTION IN 1,000 lbs. UNSHELLED NUTS)

SOURCE OF LAND	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5
	(lb.)	(lb.)	(lb.)	(lb.)	(lb.)
(1) Land already used for peanuts	5,400	10,200	17,250	25,375	31,500
(2) Land from (1) giving 2 crops per year	-	1,440	2,760	3,480	5,250
(3) New land as at (1)	1,875	2,250	2,700	4,200	4,200
(4) Mined-out land (Bauxite)	375	675	1,200	1,875	2,625
(5) Hill-side land mixed-cropped	100	500	1,100	1,800	2,400
(6) Sugarcane land before replanting	2,400	9,000	10,800	14,400	14,400
TOTAL	10,230	24,065	35,810	51,130	60,375
Seed 10% of Production	1,023	2,407	3,581	5,113	6,038
Balance	9,207	21,658	32,229	46,017	54,337
Demand for Traditional Uses	8,000	10,000	12,000	14,000	15,000
Balance for Oil Extraction	1,207	11,658	20,229	32,017	39,237

6.5.9 Peanut production in Jamaica has been concentrated around the Newton/Barton Isle area of St. Elizabeth, which parish accounts for most of the national production of peanuts. This concentration of production in St. Elizabeth has been due more to tradition than to the adoption of proper culture practices or the suitability of growing conditions.* Other areas which have a potential for producing peanuts are found in St. Thomas (lower); St. Catherine, Clarendon, Manchester and St. Ann. Small areas are also found in Westmoreland, Trelawny and Portland. Estimates of land suitable and available for the production of peanuts vary.

TABLE 8: ACREAGE IN PEANUTS & POTENTIALLY AVAILABLE

Parish	Data Bank 1978	MINAG 1979	Acreage Actually Used in the Past	MINAG *** Potential
St. Elizabeth	4,774	3,184	4,774	10,600
Manchester	279	1,263	1,263	3,000
Clarendon	651	417	651	1,500
St. Catherine	345	255	345	1,500
Westmoreland	80	108	108	500
St. Thomas	79	313	313	1,800
St. James	48	-	48	200
Trelawny	42	46	50	200
St. Mary	20	-	20	-
St. Ann	5	25	25	1,000
Hanover	3	-	3	
St. Andrew	17	-	17	100
Portland	3	3	3	
All Parishes	6,346	5,614	8,620	21,200

* L. Guthrie, Legume Extension Specialist, MINAG; 1980

The information provided in Table 8 indicates that "commercially" oriented production of peanuts has taken place on some 8,620 acres of land in Jamaica. Legume specialists in the Ministry of Agriculture reckon that there is an estimated 21,000 acres of land which could be made available for the production of peanuts without causing undue competition from other legumes for this land. The same source also indicates the contribution which could be made by mined-out bauxite land to peanut production. The acreage stated does not take into account that which will be double-cropped or any intercropping which could be done on sugar cane lands prior to replanting, factors which could lead to an overall acreage of about 37,000 acres.

6.5.10 In 1975 MINAG & CARDI reported that expansion of the areas in peanut production should not necessarily lead to competition in land use. It was suggested by Martin and Payne[1] that:-

> "The value of peanut as a legume in planned rotations should be exploited. For example, peanuts could be produced in rotation with sugar cane. Between 10% - 15% of rich alluvial soils devoted to sugar cane are replanted every year. Peanuts as a cash crop will offset land preparation cost. Furthermore, there is great potential for using peanuts in rotation with other crops on selected areas of Project Food Farms and Project Land Lease. Areas utilizing peanuts in rotation should be developed on a zoned basis so as to develop areas of concentrated peanut production".

6.5.11 Martin and Payne also suggested that in order to avoid mixing small and large seeded types of peanuts, production should be encouraged in widely separated areas - small seeded types in St.Elizabeth where they are already established, and the large seeded types in St. Thomas where a start has recently been made at Yallahs.

1/ Martin E. and Payne H. - "Some suggestions for a Peanut Development Programme in Jamaica".

Martin and Payne suggested that peanut growers should be properly organized, preferably, in the form of a co-operative, on a basis of contractual arrangements. The co-operative would be responsible for collection, shelling and storage of peanuts. Areas of research were suggested to adjust problems in the field and after harvesting.

6.5.12 Edible Oils Used in Jamaica

The principal edible vegetable oils used in Jamaica are:

(i) Coconut Oil
(ii) Soy bean oil
(iii) Corn oil; and
(iv) Cotton Seed oil

6.5.13 Coconut oil is the only one which is produced locally on a commercial basis. Efforts made with soy bean have not been entirely successful. The production of coconut oil has suffered considerably due to the devastation of old groves (tall coconuts) by lethal yellowing disease. Production from the more recently planted dwarf coconuts has not been adequate to correct losses due to decimation of the talls.

In addition, nearly one-half of the coconuts produced locally is used for the water-nut trade, which enjoys a very thriving business. Other main factors which have restricted the production of coconut oil are the land extensive nature of the crop, high establishment costs, the long maturation period, some reluctance to inter-cropping it to the extent which appears to be desirable, and last but not least, the role of the praedial thief. In spite of protective legislation a significant quantity of coconuts produced annually is used for purposes other than for the extraction of oil through the Coconut Industry Board.

6.5.14 Information presented in Table 9 shows the quantities of vegetable oils by origin and kind used in Jamaica for the three-year period 1977 - 1979 inclusive.

TABLE 9: PURCHASES OF EDIBLE OILS IN JAMAICA 1977 - 1979

OILS	YEARS					
	1977		1978		1979	
	Quantity (tons)	Value (J$)	Quantity (tons)	Value (J$)	Quantity (tons)	Value (J$)
Coconut Oil						
Local	2,106	2,130,956	1,338	1,023,239	1,400	2,615,760
Imported	3,627	1,730,765	2,114	2,860,395	798	980,521
Sub-Total	5,733	3,861,721	3,452	3,883,634	2,198	3,596,281
Soya Bean						
Locally processed	2,655	1,275,876	6,698	3,529,977	9,139	7,356,234
Imported	6,028	3,198,792	2,948	1,702,954	4,190	3,723,515
Sub-Total	8,673	4,474,668	9,646	5,232,931	13,329	11,079,749
Corn Oil	678	490,995	822	1,119,729	603	1,034,869
Cotton Seed Oil	971	528,034	96	134,595	82	126,381
TOTAL:	16,055	9,364,418	14,016	10,370,889	16,282	15,837,279

Source: Data provided by SEPROD Limited of Jamaica

6.5.15 The data indicate the following:

(i) Continuing low local production of coconut oil

(ii) Sharp decline in the quantities of imported coconut oil

(iii) Reduction in the volume of imported corn oil

(iv) Considerable reduction in the already small quantities of cotton seed oil imported

(v) Considerable increases in the quantities of soya bean imported on an overall basis - but, a reduction in the quantities of imported soya bean oil.

The comparative unit prices per ton of these oils for the three-year period are shown below (Table 10)

TABLE 10: COMPARATIVE PRICES FOR EDIBLE VEGETABLE OILS USED IN JAMAICA 1977-1979

(J$ per long ton)

OILS	Y E A R S		
	1977	1978	1979
Coconut Oil			
Local	1,011.9	1,362.7	1,868.4
Imported	477.2	974.6	1,228.7
All	673.6	1,125	1,636
Soya Bean			
Imported	530.7	577.7	888.7
Locally extracted	480.6 (90%)	527 (91.2)	804.9
All	515.9	542.5	830.6
Corn Oil	737.5	1,362.2	1,716.2
Cotton Seed Oil	543.8	1,402	2,038.4

Source: SEPROD, Jamaica Limited, Kingston, April 1980

In 1979 soy bean oil accounted for 13,329 tons or 82.3% of the 16,192 tons of edible vegetable oils used locally (Table 10). The total value of soy bean oil was $11,08 millon, locally extracted oil being responsible for 66.4% of this value. The data indicate that on average the value for locally extracted soy bean oil for each of the three years for which the data are presented was about 90% of that of the imported product.

More importantly, soya bean oil is the cheapest of all the vegetable oils being used. This oil was obtained for an average price of J$831 per ton compared with average price of $1,636 per ton in 1979 for coconut oil. This raises the question as to why soya bean production has not been pushed in Jamaica, but also lends support to considerations being given in this paper to the development of another legume, namely peanuts. It should be observed that the prices of oils on the world market fluctuate upwards at short notice, thus the figures present a situation which should favour greater efforts for increasing local production. As has already been mentioned emphasis on local production of edible vegetable oil is based largely on coconuts. The profile of coconut production over the last 2 decades since the advent of lethal yellowing disease has not been attractive. In addition there is the fact that local price of coconut oil is comparatively very high in relation to that of imported coconut oil, being $1,368 per ton compared with $1,229, and furthermore its price is much higher than that of soya bean oil ($1,368 to $831). Although the price of corn oil is somewhat less than that of locally produced coconut oil it is still considerably higher than that of soya bean oil. The main support for corn oil in this situation would be medical considerations. In the same context and for health purposes there would be disadvantages where coconut oil is concerned.

6.6 Regional (CARICOM) Demand for Peanut & Peanut Products

6.6.1 The peanut has been used in countries of the CARICOM region for several decades. Its major uses are the same as those for Jamaica, namely as the whole nut roasted and salted (often canned), as an ingredient in confectioneries, in beverages having a milk base, and also as raw material for processing into peanut butter. Partial processing is done to make these products locally, using peanuts which are largely imported from extra-regional countries.

6.6.2 Some of the baby foods consumed within the region contain peanut by-products. Peanut meal, the residue left after extracting the oil from the nut, is a valuable ingredient of animal foods (especially for poultry and pig production). The oil which is extracted from the peanut fetches premium prices on world markets . Its high price has curtailed its use (as a vegetable oil) in the CARICOM countries due to the existence of cheaper oils such as coconut, soya and corn.

6.6.3 The region produces less than one-half the quantity of peanuts and peanut products which its people "demand". This "demand", however, is not a true indication of the real demand for peanuts and peanut products. Limitations forced by a critical shortage of foreign exchange earnings have forced many of the CARICOM countries to adopt restrictive import policies on a number of food items. In addition, there are many other uses than the more traditional ones for the region which could be exploited and which could increase the potential demand considerably.

The region uses large quantities of vegetable oils for cooking and for processing into margarine. The quantities are not available for presentation in this paper. The region also uses large quantities of oil cakes in the

formulation of animal feeds, especially for poultry and pigs. The low regional production of grains in general and maize in particular, as well as a shortage or total lack of locally produced oil cakes of legumes has placed a burden on the struggling coconut industries of the region which have been badly hit by diseases and other factors. Regional demands for vegetable oils and oil meals have thus been largely met from imports.

6.6.4 The countries' economic situation dictates that imports should continue to be restricted. This provides peanuts not only for use in non-processed or semi-processed forms, but also for more sophisticated processing which entails the extraction of oil and the use of the residue for the production of human foods and animal feeds.

6.6.5 There are reasons which in the past may have justified the high dependence of the region on imported peanuts and peanut products but this position must now be reviewed very seriously. One of the main reasons which itself also led to others was the competition for suitable land for producing the crop. There was also the inadequacy of production technology and the unavailability of suitable seed material. Additionally the peanut is not a crop which up to now has attracted much attention in terms of research or financing for development. Low production has been associated with low productivity in relation to the inputs used, as evidenced by low yields and ultimately high unit costs. World demand, as well as increases in cost of production factors, has placed imports in a position in which it becomes challenging for the CARICOM countries to place greater emphasis on local production.

6.6.6 The changing approach towards a greater degree of self-sufficiency has taken very long to emerge in view of the fact that as far back as 1974 consideration was given by the CARICOM region, first in initiating the Regional

Food Plan which led to the creation of the Regional Food Corporation, to pursue measures which would reduce the reliance on imported food items. The Regional Food Corporation took a very long time to get started, and after starting has literally crawled. The crops which obtained special mention were legumes (including peanuts).

6.6.7 The Caribbean Common Market area (CARICOM) consists of the following 12 member countries:

Barbados)	
Guyana)	
Jamaica)	More Developed Countries (MDCs)
Trinidad & Tobago)	
Antigua)	
Belize)	
Dominica)	
Grenada)	
Montserrat)	Lesser Developed Countries (LDCs)
St. Kitts/Nevis/Anguilla)	
St. Lucia)	
St. Vincent)	

The two mainland countries, namely Guyana and Belize, together with Barbados, Guyana, Jamaica and the twin island state of Trinidad and Tobago constitute the More Developed Countries (MDCs) of the CARICOM region. The others constitute the Lesser Developed Countries (LDCs).

6.6.8 The two mainland member countries have vast areas of underdeveloped and undeveloped lands which have a potential for the production of peanuts. Not all of this land is suitable for immediate use. The island countries which constitute the remainder of the CARICOM countries have a major constraint in terms of their high man/land ratio , and consequently a relative shortage of land for the production of peanuts. The strategy in these countries, therefore, in keeping with the objective to achieve a greater degree of self-sufficiency in crops such as peanuts is to endeavour to become more efficient and to use production inputs (including land) more intensively.

6.6.9 In the CARICOM region peanuts are widely used [1] in preparing processed snack foods, eaten raw or roasted or consumed in confectioneries, ice-cream and milk-based beverages. It was estimated that in 1975 consumption for the region was of the order of 24 million pounds annually, of which a quantity of 13 million pounds was imported from extra-regional sources. Trinidad, possibly the largest consumer of peanuts in the region, produces little or no peanuts but imports nuts and processes these for its local requirements, and also for exports to other CARICOM countries including Jamaica. In 1975 alone Trinidad imported some 13 million pounds for its snack food production and also exported quantities of canned peanuts to other CARICOM countries.

6.6.10 In 1975 foreign exchange limitations for the region were by no means as critical as those which have developed since the beginning of the year 1980. The real 'demand' for peanuts for traditional uses in the region under less restrictive conditions is likely to be greater than 30 million pounds.

6.6.11 Virtually all regional production of peanuts goes to the fresh trade. Unshelled nuts are sold to higglers and hucksters who roast and sell them to a public which, for many reasons, has not acted in a very discriminating manner in terms of product rejection for various causes. The demand for locally produced peanuts in the CARICOM region is increasing, and so the figure of 30 million pounds may fall short of what is actually required. Processing depends largely on extra-regionally imported nuts, and while it may have been desirable in the past to think in terms of comparative economic advantages the present situation must focus on the shortage of foreign exchange earnings and the need for greater local production.

6.6.12 Unfortunately, even when considerations were being given to a regional programme for the development of peanut industries, little serious thought was given to aspects relating to the non-traditional situation. To a considerable extent the importance of peanuts in the region continues to be examined almost entirely in terms of meeting the demand for traditional uses.

6.6.13 No recognition as such was given to the potential for producing peanuts for the extraction of peanut oil as a replacement or substitute for other vegetable oils, or for the associated production of oil which would have a similar replacement effect on extra-regionally imported oil meals for formulating livestock feeds.

6.6.14 In 1976 the Council of the Eastern Caribbean Common Market (ECCM) mandated its Secretariat to initiate an examination for establishing a regionally integrated peanut industry. This arose from a Regional Food Plan proposal for the preparation of a project outline for the production, processing and marketing of peanuts in the Region, and concentrating production where possible in the ECCM States. The purpose in this paper is not to question the need for developing industries in the LDCs but rather to face the grim realities with respect to the main objective of seriously reducing reliance on extra-regional imports.

6.6.15 A few of the LDCs were at one time producers of significant quantities of peanuts, especially St. Vincent, Montserrat, Antigua, and Barbuda. Since 1974 there has been a considerable decline in production from the production in the 1950's. The major reasons given for the decline were: 1/

1/ Ibid - CDB Proposal for Regional Commercial Peanut

(i) Land is being used for alternative crops which give better returns to farmers, eg., banana cultivation mainly by small and medium size farmers;

(ii) Increasing costs or production, relatively poor quality produce derived from the common use of unimproved varieties and low levels of cultural practices; and

(iii) Low prices received for exports in competition with extra-regional imports which make it unprofitable for farmers to produce peanuts.

6.6.16 For the processing trade there are plants in Trinidad, Jamaica and St. Lucia. They have depended on imported nuts largely from the USA and Africa. They require nuts of good quality which are uniform in size. At present these processors indicate that "they would not be willing to purchase nuts from any territory in the region due to high price and poor quality" 2/ Jamaica, however, due to enforced circumstances is meeting part of its processing requirements from local production.

6.6.17 Arising from the mandate given to the ECCM Secretariat four (4) member countries (or groups of countries) namely:

(i) Antigua and Barbuda
(ii) St. Kitts/Nevis/Anguilla
(iii) Belize
(iv) St. Vincent

were selected to participate in a project to be financed by grant funds provided by the Caribbean Development Bank (CDB) for "A Pilot Commercial Peanut Cultivation, Harvesting and Marketing Project for the Less Developed Territories of CARICOM".

2/ Ibid - Production page

The project proposal prepared by the CDB for the pilot commercial production and marketing of peanuts in the selected countries already listed discusses:

(i) Recent research on peanuts in the region;

(ii) Achievements by the Caribbean Agricultural Research and Development Institute (CARDI).

- Selection of varieties of high yielding bunch types;
- Completion of varietal trials in St. Vincent in collaboration with its Ministry of Agriculture;
- Initiation of trials in Antigua, St. Lucia and St. Kitts; and
- Development of a package of practices for small farm systems which were tested in Trinidad and obtained yields of 4,000 lbs. per acre on 0.25 acre plots. The package is being refined with a view to extending its use for guiding peanut producers in the CARICOM region.

6.6.17.1 The CDB funded project which is being established in 4 countries listed above consists of commercial plots of 50 acres. It relates entirely to the LDCs, and is predicated on a long tradition in growing peanuts, association with small farmer participation, and availability of suitable land. Belize is the only one of the four member countries named above which will not have serious problem meeting the land availability criterion.

6.6.17.2 Additionally the project is intended to demonstrate that good quality peanuts can be produced regionally for processing at prices which are reasonably competitive with imports and profitable to farmers. Jamaica is already producing peanuts which are being

used by the local processor, and it would seem that both processor and producer must work in unison to obtain the best compromise possible.

6.6.17.3 The project is intended to last for 3 years and will require funding of US$423,000 over the first 2 years . 1/ This is being provided as a grant by the CDB. The funding for the third year is expected to be provided from project generated returns.

6.6.18 The estimated regional demand of 30 million lbs unshelled peanuts already mentioned in section 6.6.10 of this review does not include the potential demand for oil extraction. Provision of peanuts for oil extraction is an important consideration, especially in view of the fact that the region imports large quantities of vegetable oil as well as large quantities of ingredients for the formulation of high nutrient status animal feeds.

6.6.19 There exists very little reliable information in precise terms on this regional demand for peanuts and peanut products. Information of this type which was requested from the CARICOM Secretariat was not then available. On the basis of known imports as recorded in the trade statistics for those countries which keep reasonably reliable data, it was possible to arrive at a figure of 15 million lbs. of imported peanuts in 1974/75. However, a true demand picture is really not available due to the various constraints which have been placed on importation.

1/ Source: Proposal for Allocation of Grant Funds to a Pilot Commercial Peanut Cultivation, Harvesting and Marketing Project for the LDCs of CARICOM prepared by Caribbean Development Bank.

6.6.20 With respect to the potential demand, some of the larger consumers of oil by-products have been able to provide information which can be used as a basis for estimating demand for vegetable oils and livestock feed ingredients.

The exercise being undertaken in this presentation does not require at this stage precise and refined data on the potential demand. It is sufficient to indicate that the potential regional demand far exceeds the present capability of the CARICOM member countries to produce. By the same token, it is very safe that a development and expansion programme in Jamaica will not serve as a deterrent to development elsewhere in the region. Indeed this was the consensus of technical personnel from Guyana, Barbados and Trinidad and Tobago.

6.6.21 This therefore makes it possible to examine an expansion of the Jamaican peanut industry at least in terms of meeting Jamaica's potential demand over a realistic period. This demand should be considered in relation to:

(i) Raw nuts for roasting
(ii) Nuts for canning
(iii) Nuts for oil extraction
(iv) Oil meal for use as livestock feed ingredients

The acreage projections suggested in Table 6 present a basis for determining what quantities of these products can be produced. Although the quantities proposed cannot be regarded as firm at this stage they provide a useful basis for planning a programme which could achieve the provisional targets set. This largely is the exercise which must be undertaken when the project profile is being prepared.

Projected Yields

As already indicated, island yields averaged 1,100 lbs of unshelled peanuts per acre in 1979. Costs of production have been determined using 1,200 lb as the yield. However, under the same conditions and using the same imprints yields as high as 1,500 lb per acre have been obtained. This shows that unit costs vary from farmer to farmer. Application of improved technological practices can increase yields beyond the 1,800 lb per acre limit. The data presented in Tables 5 - 7 must therefore be regarded as conservative.

5.7 THE GAP

The difference between the quantity of peanuts consumed or to be consumed and the quantity produced gives a partial indication as to the developmental potential of the local peanut industry. As consideration is given to non-traditional local uses of peanuts, foreign exchange aspects, increased farm incomes, reduction of dependence on imprints and so forth, the projected production figures presented in Tables 6, 7 and 8 gain greater relevance. The gap in this sense is difficult to determine in view of the fact that it depends on a conscious and determined effort to push production to the extent where other uses may be accommodated. In this sense the gap could be anywhere between the existing 2 million lb. unshelled peanuts, based on current usage and the 60 million lb. nuts projected in Tables 6 - 8. The "gap" is interesting and challenging as it really determines the will to establish a viable peanut industry.

7. MISCELLANEOUS

7.1 FARMER ORGANIZATION

The way in which farmers engaged in a particular industry are organized in their common interests, often serves as a useful measure of receptivity for advancement. This is particularly true of the traditional peanut farmers of Jamaica, nearly all of whom are small farmers.

7.7.1 In 1971 a Peanut Farmers' Association was inaugurated at Newton in the Parish of St. Elizabeth. Its main objective was to obtain better conditions for some 1,500 peanut farmers in that parish. The feeling was that peanut as a crop had been considerably neglected, and that as a consequence the crop was performing considerably below its potential.

Production at that time was largely confined to the areas of Southern and Northern St. Elizabeth. In the northern areas yields of 50 - 60 bushels (1,000 to 1,200 lbs) per acre were obtained under rain-fed conditions. In the northern section MINAG's demonstration plots had obtained yields up to 70 bushels per acre. In the southern section only one crop was produced annually while many farmers obtained two in the northern areas.

Some 3 years ago the Peanut Farmers' Association approached the MINAG with a view to taking steps to improve the industry. The Peanut Farmers' Association expressed the opinion, during the last 2 months, that under continuous and unimproved conditions over the years the fertility of peanut soil has deteriorated and that this has adversely affected yields. Farmers themselves identified problems (not unsurmountable) in the following areas: Land preparation, Marketing, Drying and Storage, Land availability and Financing.

7.2 Land Preparation

Generally speaking the lands used were flat and were prepared by mechanical tillage. The quality of preparation was usually not satisfactory due to the fact that most farmers could not afford the intensity of ploughing, harvesting, etc., which would have provided good tilth. The small farms thus used were often under 2 acres and were privately owned. Some farms were 3 acres in size. More recently farmers under the Project Land Lease programme have been able to obtain land up to 3 acres on a leased basis. Currently tractor for the most complete preparation of land can be achieved at a rate of $80 per acre. (This figure is of course subject to continuing changes in the costs of labour and materials). The poor tilth which is associated with incomplete land preparation often leads to reduced yields.

Many farmers claim that they need larger farm units, but the amount of land available is based largely on demand and supply. The existence of these small farms often is associated with improper crop rotation, thus one sees a succession of peanut crops on the same farm. This results in a build up of pests and diseases and ultimately reduced yields per acre. These and other reasons cause some farmers to feel that with more land they would be able to pursue appropriate rotation systems.

Farmers are aware of the problems which are associated with harvesting and storage, and have taken measures to minimize the effects of some of them, especially in connection with aflotoxin. They are willing to use solar energy for drying, but their Association suggests that any large expansion programme should include provision for electrical drying as a stand-by against

eventualities. Additionally, it has been suggested that barbicues of appropriate size be strategically located to accommodate solar heating for a number of small farmers on a co-operative basis.

7.3 Seed Quality

Farmers are conscious of the need to improve seed quality both for planting material and for consumption. One major problem relates to seed size - small seeds and jumbo size seeds. These need to be sorted out so as to achieve uniformity for several reasons. Seed quality also affects germination rates and farmers are desirious of obtaining a source of good quality seed. Although for the most part they have traditionally relied on seeds from their own production for replanting, they are able to understand some of the disabilities inherent in this practise.

7.4 Marketing

Approaches made by "organized" peanut farmers for assistance in marketing peanuts have not had very successful results. Reported responses from the Agricultural Marketing Corporation (AMC) had led peanut farmers to feel that the AMC is only interested in handling surplus production. The Peanut Growers' Association was desirous of having the AMC act as its main marketing agent and requested that body to formulate an overall plan which would include the collection of a small cess from each farmer's returns which would be used for the furtherance of farmer services and crop improvement. This request was not favourably considered and the peanut farmers have had to rethink their strategies for assistance. By and large the higglers pay better prices and market the most of the crop produced.

7.5 Co-operative Aspects

Co-operative approaches to the development of a national peanut industry have been considered by the Peanut Growers' Association. Their efforts in trying to obtain registration by the Co-operative Deaprtment have been thwarted. This has been a sad blow to the farmers who are now sparing no efforts to obtain their objectives through other means. The Association has, inter alia, articles of association, a clear structure, an executive body, and a strong desire to have an expanded and improved peanut industry. At present, the Association's main activities have been concentrated in the St. Elizabeth and Manchester areas in which peanuts have been traditionally produced. However, there is little doubt that the development could be structured to cover a nationwide industry.

The Association tried to obtain membership in the National Farmers' Union (now virtually defunct) but was estopped from gaining membership due to the prohibitive entrance fee of $1,000. Additionally, the Association has sought collaboration from the Jamaica Agricultural Society (JAS). However, it has not been fortunate in obtaining similar recognition as the more export-oriented association such as The Cane Farmers' Association, The Citrus Growers' Association, The Commodity Association for Coffee, Cacao, Banana, Pimento, among others.

7.6 Financing

Members of the Association receive financing assistance from the crop lien programme - loan valued at two-thirds of the determined cost per acre of producing the crop. Other loan arrangements to date have not been very structured. Reference has already been made to the suggestions concerning a ccss for assisting in the financial arrangements. The fact is that since peanuts

have not been accorded much if any assistance in the past, special financing arrangements must be made to ensure the level and types of activities which will be necessary.

7.7 PRODUCTION COSTS

The cost of production per acre of peanuts varies considerably depending on the conditions under which the crop is grown. The conditions envisaged for the industry's development will all be regarded as being commercially oriented. The systems of production will range from pure cropping through mixed cropping at different levels depending on the other intercrops used as well as the edaphic and climatic conditions of the areas selected. The attached Tables present 3 systems and costs ranging from .42¢ to .83¢ per lb. These figures have changed since they were first prepared, as have the value of the product. What would have remained relatively constant, assuming ceteris paribus, are the number of man-days required for producing the crop under varying conditions, and the quantities of other production inputs. It is assumed that increased unit prices of inputs will be reflected in appropriate changes in the unit price for peanuts.

Provided certain practices are followed yields no less than those presented in the Tables should be obtained, and by the same token they should in fact exceed those presented, especially where pure cropping is pursued. The data refer to average conditions and make no reference to the quantitative ranges. For mixed cropping the ultimate cost per pound of peanuts produced will depend to some extend on which is the major crop in the system of inter-crops. Average yields should now be closer to 1,500 lb. of unshelled nuts per acre. It is the consensus that given existing cost/price relationships

and the added factor of foreign exchange gaps, and taking into consideration the application of the technology which is available, it should be possible to produce peanuts at prices which will be feasible for processors as well as for those involved in the 'raw' nuts market.

The cost of production details available indicate that with more efficient production cost per unit of peanuts can be reduced considerably, while at the same time increasing incomes of farmers who are engaged in the production of this crop.

TABLE 1: COST OF PRODUCTION PER ACRE - (JAMAICA)

On Bench Terrace

Cropping Scheme: Yam - Peanut - Potato

Crop: Peanuts (4 months)

Area: Allsides, Trelawny

Duration of Scheme: 1 year

Plant Population: 52,300

Items	Rate	Cost ($)
A. Labour Operation		
Land Preparation		45.00
Banking		30.00
Shelling, treating & planting 2 m.d.	$8.00/m.d.	16.00
Weeding and moulding - 5 m.d.	$8.00 -	40.00
Spraying - 3 m.d.	$8.00 -	24.00
Harvesting and threshing - 3 m.d.	$8.00 -	24.00
Drying and bagging - 2 m.d.	$8.00 -	16.00
Sub-Total		195.00
B. Materials		
Planting material - 3 bushels	$16/bushel	48.00
Dithane - 6 lbs.	$ 9/lb	54.00
Basudin - 6 lbs.	$ 9/lb	54.00
Sub-Total		156.00
C. Other Charges		
Contingencies & Depreciation:	10% of A 5% of B	20.00 8.00
Land Charges - $35.00 per year		18.00
Interest - 17% per year		22.00
Sub-Total		68.00
Return for Risk and Management - 20%		84.00
Total Cost of Production		503.00

Remarks: Total land preparation charge divided equally among different crops in rotation.

Marketable Yield: 1,200 lbs.

Cost of production per lb. = .42¢

Source: Adapted from data IICA/Jamaica Office October 1979

TABLE 2: COST OF PRODUCTION PER ACRE

Crop: Peanut
Duration: 4 months
Population: 87,000 (18"x4")

	Items	No. of Times	Rate	Cost ($)
A.	Labour Operations			
	Land Clearing	1	$50.00/acre	50.00
	Ploughing & Harrowing	1	$80.00 "	80.00
	Banking	1	$30.00 "	30.00
	Shelling, treating & planting - 4 md	1	$ 8.00/md	32.00
	Fertilizer Application - 2 md	1	$ 8.00 "	16.00
	Weeding and Moulding - 10 md		$ 8.00 "	80.00
	Reaping and Threshing - 8 md	1	$8.00 "	64.00
	Drying and Bagging - 5 md	1	$8.00 "	40.00
	Sub-Total			392.00
B.	Materials			
	Planting material - 5 bushels		$16.00/bushel	80.00
	Fertilizer - 4 cwt.		$25.00/cwt	100.00
	Dithane - 6 lbs.		$ 9.00/lb.	54.00
	Basudin - 5 lbs.		$9.00/lb.	54.00
	Sub-Total			288.00
C.	Other Charges			
	Contingencies and Depreciation	10% of A		38.00
		5% of B		14.00
	Land Charges		$35.00/acre	10.00
	Interest - 12% p.a.			43.00
	Sub-Total			114.00
	Return to Risk and Management 25%			199.00
	Total Cost of Production			993.00
	Yield: 1,200 lbs.			
	Cost Per lb. = 83¢ per lb.			

Source: Planning and Policy Review Division - Ministry of Agriculture

October 1979.

TABLE 3: COST OF PRODUCTION PER ACRE - PEANUTS

A. Labour Operations	Unit Cost ($)	Total Cost ($)
A. Labour Operations		
Land Clearing	40.00/acre	40.00
Ploughing (2 ways)	50.00 "	50.00
Harrowing (2 ways)	30.00 "	30.00
Banking	15.00 "	15.00
Planting & Fertilizing - 4 m.d.	7.00/m.d.	28.00
Weeding & Mounding - 6 m.d.	7.00/m.d.	42.00
Spraying - 6 times - 6 m.d.	7.00 "	42.00
Shelling & Treating - 2 m.d.	7.00 "	14.00
Reaping and Drying - 8 m.d.	7.00 "	56.00
Bagging Transport to stores - 2 m.d.	7.00 "	14.00
		331.00
B. Materials		
Seeds - 5 bushels	16.00/bushel	80.00
Fertilizer - 4 cwt	20.00/cwt.	80.00
Dymid - 4 lb.	9.00/lb.	36.00
Dithane - 12 lb.	9.00/lb.	108.00
		304.00
C. Other Charges		
Contingencies and Depreciation	10% of A	33.00
	5% of B	15.00
Land Charges	35.00/ac/yr.	18.00
Interest	10%/yr.	31.00
		97.00
Cost of Production		732.00
Add 25% Return to Management		183.00
		915.00
Marketable Yield 1,200 lbs.		
Cost per lb.		76.25¢

Source: Planning and Policy Review Division - Ministry of Agriculture

September 1979.

8. RATIONALE FOR THE DEVELOPMENT OF THE PEANUT INDUSTRY IN JAMAICA

Reference in general terms has already been made in this paper to considerations which support the development of the peanut industry in Jamaica. The most important factors seem to be the desire of local farmers themselves to become involved in peanut production and to have the industry placed on a structured basis. This is due to their own recognition of some of the reasons which support the desire and which are presented in the sub-section which follows.

1. 8.1 Increased Farm Income

Present yields from the production of peanuts are considerably below the potential. It is possible, as has been demonstrated by experimental and commercial types of production, to increase yields considerably in relation to the inputs. The main results are thus to increase gross revenue in the first place while leaving a net income greater than has generally been obtained so far. An increase from the island average of 1,100 lbs. of unshelled peanuts to one of 1,500 lbs. with little increase in the quantities of inputs, gives an indication of the increased returns which can accrue to farmers. This assumes increased costs of inputs.

2. 8.2 Import Substitution

Jamaica produces only a part of the normal traditional demand for peanut and peanut products. Increased local production associated with deliberate restrictive import policies has already resulted in increased local production. In terms of the potential demand, there is a realistic and great opportunity for expanding the peanut industry to produce peanut oil which can replace other vegetable oils being imported, especially soy bean and coconut oils.

8.3 Agro-industry

A programme which increases peanut production to supply peanut oil automatically has backwards and forwards linkages for the agricultural-agro-industrial development of the country. Given a demand for the peanuts for processing the ability to produce it and the availability of appropriate processing machinery and skills, there is a real potential for the expansion of agro-industrial development using the peanut as a basis.

An important result of the agro-industrial operations is the production of other by-products such as animal feeds and human food ingredients which will result from peanut oil extraction. These will provide significant quantities of raw materials which can replace a portion of imported inputs for animal feeds, etcetera.

8.4 Foreign Exchange Earnings

These are likely to be both direct and indirect. It will be possible to provide products which can be exported such as peanut oil, thereby earning foreign exchange, or, on the other hand to save foreign exchange by reducing national expenditure on imports of peanuts and peanut products, as well as other oil seed cakes (a substitution effect).

8.5 Feasibility of Local Production for Various Uses

Expanded local production of peanuts will depend largely on the ability to find additional land for production and also on the ability to increase yields from lands now being used to produce peanuts. Additionally this therefore, will depend on the availability of farmers who have appropriate knowledge or who can acquire this knowledge through involvement in training programmes. Adequate information is available to indicate that:

(i) Farmers themselves are desirous of increasing and improving peanut production;

(ii) Improved technological practices have been developed which if applied will lead to increased yields, increased income to the farmer and a reduction in the unit costs of unshelled peanuts; and

(iii) Peanut as a crop has received very little attention in Jamaica. The feasibility of expanded production must depend largely on specific measures to be taken to finance production through the provision of adequate credit, necessary infrastructure, and appropriate storage and marketing arrangements.

Reduced unit cost of unshelled peanuts is a sine qua non for the development of agro-industries based on peanuts. The anticipated increased yields consequent on the adoption of improved practices are bound to reduce the unit cost of raw nuts. Again, if production programmes are to be feasible they must be predicated on the satisfactory involvement of producers, be these individual farmers, groups of farmers or the state. This implies firm commitment by farmers in particular, perhaps through their associations, that they are willing to become involved.

8.6 Conflicts with Regional Development

Regional efforts for development of the peanut industries of the member countries of CARICOM indicate quite clearly that programmes being contemplated are totally peripheral. They gave consideration only to traditional uses and give little, if any, thought to production of peanuts for oil extraction. This is the aspect which will have the greatest economic benefit to the region. As a consequence,

existing and current proposals fall considerably short of the potential for development. In any event the development expected in the rest of the CARICOM area is considerably limited by the unavailability of land.

Specific answers obtained from the other MDCs of CARICOM indicate quite precisely that an expanded peanut industry in Jamaica along the lines being considered in this presentation will provide no conflict with regional development, and in fact could possibly provide the fillip necessary for greater regional development (See Trip Reports, Abdul H. Wahab, and Irving E. Johnson, attached as Appendices). The CARICOM exercises presently focus sharply on the LDCs who are already constrained by shortage of land. The development programmed for these countries will not be affected by the proposal being formulated for an expanded industry in Jamaica.

9. SUMMARY OF BENCH MARK INFORMATION FOR EXPANDING PEANUT INDUSTRY

(1) Peanuts grow satisfactorily in a number of well-defined areas in Jamaica, specifically in St. Elizabeth and Manchester. A potential also exists for production in the parishes of St. Thomas and Clarendon, St. Catherine and St. Ann.

(2) Effective acreage is currently 6,000 crop acres per annum but this can be extended considerably on a planned basis to 36,000 crop acres without affecting the production of competing crops.

(3.) Some farmers have already demonstrated the ability to produce the crop efficiently but in general terms production performances are limited by several factors such as:

- unavailability of land;
- inadequacy of seeds - qualitatively and quantitatively;
- lack of appropriate technical know-how;
- inadequacy of strategies for accommodating peanut production within appropriately planned rotation systems;
- inadequate national support for the local development of the crop, inclusive of inadequate financing, research, extension, marketing, etc;
- historical reliance on imported peanuts to the disadvantage of local production; and
- inadequate farmer organization.

(4.) Present consumption is of the order of 6 million lb. unshelled nuts per annum of which only about 70% is produced locally.

(5) A significant portion of imported peanuts and peanut products is obtained from CARICOM countries which themselves are not importers of these products.

(6) Production of peanuts continues to be related to local traditional usages, ignoring almost completely the potential for modern usages, particularly processing.

(7.) There exists a considerable potential for expanding local peanut production without affecting regional peanut strategies.

(8.) Unavailability of land based on present land use strategies is a major factor affecting low production of peanuts, but there is also the question of low yields per acre due to the existing practices adopted.

(9.) Within the last decade there has been a growing awareness of the potential for expanding local peanut production. This realization has resulted partly from the critical shortage of foreign exchange needed to import raw materials including peanuts for processing, and partly from IICA's findings arising from the cropping systems demonstrated in the GOJ/IICA Allsides project.

(10). Main problem areas which need to be addressed include:

- provision on a continuous basis of seed of higher yielding strains which are resistant to pests and diseases;
- provision of seeds which will meet stated processing requirements specifically in relation to size of nuts, hulling characteristics; shelling percentage, and oil content;
- low germination percentages;
- poor storage facilities (Discussions should be held with the State Trading Corporation); and
- inadequacy of financing.

(11.) With reference to land availability it is the consensus that many actions need to be taken simultaneously on several points. These include:

- the preparation of planned farming systems which include peanut as an intercrop, setting out required inputs and expected outputs, as a means of demonstrating economic justification of these systems;

- discussions with leaders of the sugar cane industry and cane farmers (individually) to obtain collaboration in initiating projects (pilot) for growing peanuts during the period between harvesting and replanting of ratoon sugar cane.
- planned development of peanuts in areas similar to those on which peanuts are now grown;
- production of peanuts on mined-out bauxite lands (possibly through joint effort of MINAG), the Bauxite Companies prior to PLL allocations being made;
- preparation of suitable technological packages for the production of peanuts under variable conditions.

(12) Farmer Organizations

The existing Peanut Farmers' Association provides a very appropriate basis for the development of a farmer organization for the peanut industry. It is apparent that the organization is now largely oriented to farmers of St. Elizabeth& perhaps Manchester (some 1,500 farmers). The scope of this Association would have to be broadened to give it island-wide connotations. Additionally, it will be necessary to expand its areas of responsibility to obtain firstly legal entity and to include such aspects as co-operatives, storage, marketing and financing.

(13) Processing

Early discussions should be held with potential processors viz Seprod and Jamaica Soya Projects Limited to derive possible arrangements (contractual or otherwise) including pricing. The price proposals should take into consideration the value of the oil as well as the peanut meal to be used as an animal feed ingredient.

In view of the fact that the extraction of peanut oil in Jamaica is a new venture, early arrangements must be made for trial runs to test the feasibility and efficiency of existing processing facilities to accommodate peanut oil extraction.

(14) Adaptive Research

This should be pursued by MINAG in conjunction with Extension Specialists (legumes) working with this crop. It should monitor such aspects as the performance of existing established strains with a view to improvement where possible.

(15) Seed Production

Consideration should be given to the provision of planting material beyond the level of just saving back seeds on an annual basis. This particular service should be commercialized and should include safeguards for ensuring the provision of seeds of as high a degree of viability as possible. It will be necessary to take specific steps to procure planting material from external sources until there is a satisfactory build-up of local seed production.

(16.) Soil Management

Basic soil and other agronomic tests should be carried out as a means for providing appropriate guidelines and advice to farmers so as to ensure reasonable success. This basic information should form an integral part of the technological package for peanuts. Such a package, clearly is not a final document, but must be revised on a continuing basis.

(17.) Financing

Specific programmed financing arrangements must be made to ensure the development of the proposed industry.

ANNEX #1

TRIP REPORT (8/10/79 - 18/10/79)

by IRVING E. JOHNSON

A. ASSESSMENT OF PEANUT PRODUCTION AND DEMAND IN BARBADOS

1. Discussions with Director, IICA/Barbados Office

1.1 The Director had received the documents forwarded to him from the IICA/Jamaica Office but had a number of reservations concerning possible reactions to the circular note sent for distribution to key persons in the peanut industry.

1.2 He felt that the contents of the letter touched on areas which he considered to be sensitive ones and which could result in non-cooperation of the personnel in Barbados.

1.3 The objective of the study explained to him in precise terms, was to ensure that there would be no conflict between proposals by Jamaica and actions already taken or proposed by other CARICOM countries for expanding peanut industries.

1.4 In order to obtain the answers necessary **for 1.3,** it would be necessary to ascertain what other countries are doing. This was not regarded by the author to be a sensitive area, since in any event, provision is made for this kind of analysis to be undertaken at regular intervals through the AMP (Agricultural Marketing Protocol) of CARICOM. The author pointed out that it is well known, that the information presented to the AMP and the analysis ensuing fell very short of the requirements for project formation.

1.5 The IICA/Barbados Director pointed out that many of the persons whose assistance had been sought were off the Island. In some cases the relevant offices were not currently being operated.

1.6 Firm appointments had been made with:
Mr. Atlee Brathwaite, Chief Economist, MINAG.
Dr. Don Walmsley, Head of CARDI Office in Barbados.
Mr. Victor Ojeda, Agricultural Economist of the IICA/Barbados Office.

1.7 Key persons who would be unavailable for discussion included:

Mr. Percy Jeffers, Ministry of Agriculture
Dr. Bernard Yankey, CDB (Agricultural Projects Division)

1.8 Dr. Lewis Campbell, Head Agricultural Projects Division, indisposed.

The author would endeavour to contact other persons, particularly in the CDB.

2. Discussions with Atlee Brathwaite, Chief Economist, MINAG, Barbados

The objectives of the Jamaica proposal were explained and during the exchange of views the main points which emerged were:

2.1 Barbados' production profile for peanuts has been unpredictable and irregular. Production, acreages, and yields per acre have shown much variation. At present Barbados produces only one-third of its actual requirements.

2.2 A study was carried out in 1974/75 using OAS financing and Technical assistance to determine the use of peanuts in a diversified agricultural programme for Barbados.

2.3 Barbados has plans for expanding peanut production along lines similar to those contemplated by Jamaica. In the short run it would hope to provide fresh nuts for roasting; in the medium term it would produce for the manufacture of peanut butter; and in the longer run consideration might be given to the production for oil extraction and the manufacture of animal feed ingredients.

2.4 In its provisional strategy for "FOOD PROCESSING OPPORTUNITIES FOR BARBADOS, (1977)" (Confidential) relevant statistics are presented concerning the Barbados peanut industry. The document was prepared by a Planning Unit/FAO Project of the Barbados Ministry of Agriculture, Food and Consumer Affairs. Some of the more important information arising from the report are as listed hereunder:

2.4.1 Barbados is a net importer of peanuts.

2.4.2 Production, however, has fluctuated considerably;

2.4.3 Peanuts are grown in Barbados for direct consumption as fresh or roasted nuts in the shell.

2.4.4 Yields range from 1,600 lb per acre under irrigated conditions to 1,200 - 1,400 lb per acre under rainfed conditions. Ex-farm price in 1975 was 90¢ per lb unshelled.

2.4.5 Production of peanuts can be increased, but it is thought that production for oil at this stage (1977/78) would result in very low returns per acre;

2.4.6 Processing, therefore has been considered only to the stage of manufacturing peanut butter.

2.4.7 Development of the local salted peanut industry in Barbados has received a threat from two large capital intensive plants (Holiday Foods), one each in Trinidad and St. Lucia - "enjoying tax concessions, they can buy peanuts from extra-regional sources and sell the products duty-free within CARICOM".

2.4.8 It was believed that although ex-farm prices of unshelled nuts produced locally are usually higher than import prices, economic advantages may be gained for local (Barbados) salted nut industries, since offsetting profits can be made from peanut butter manufacture as part of an integrated peanut project.

2.4.9 Barbados is actually studying proposals for using relatively small unsophisticated processing plants which could become part of a food processing complex.

2.5 From an agricultural point of view the main considerations relate to the procurement of tested varieties which will:

2.5.1 improve yields per acre under irrigated and rainfed conditions, while at the same time provide remunerative income for the farmer;

2.5.2 be suitable for the particular use(s) for which they are being produced.

2.6 Additionally, it will be necessary to work out appropriate technical packages of procedures for application under varying situations. Land constraints, in terms of comparative advantage for the production of other crops will determine the extent to which peanut may be produced.

3. Discussions with Dr. Don Walmsley, Leader of the CARDI Office in Barbados

Main observations were:

3.1 Barbados is producing less peanuts than its requirements;

3.2 processing is largely at the level of snack foods and does not exhaust the potential for developing peanut industries within the region;

3.3 a necessary condition for the development of regional peanut industries is the identification of suitable high yielding varieties for the production of oil and/or fresh nuts at levels which will be remunerative to participants.

3.4 most of the work on peanuts had been undertaken by Dr. S. A. Haque, Leader of CARDI, Trinidad. In addition to:

3.4.1 Preparing a brochure titled "Know Your Peanut", he had

3.4.2 Produced a technical package of practices for producing peanuts in Trinidad.

3.5 there is also available a brochure titled "Closing the Protein Gap", prepared by the Agricultural Information Service (AIS) of Jamaica.

4. Discussions with Staff of the CDB

4.1 These discussions were scheduled with the higher echelons of the CDB's staff, specifically to obtain views concerning the CDB's stance regarding assistance in developing regional agricultural production, with a view to meeting the objectives set out in the Regional Food Plan.

4.2 Broad aspects covering the formulation and preparation of agricultural projects in general were discussed, specifically with respect to funding. Whilst some financing is available for agricultural projects it was the consensus that these projects are not progressing as expected. In this connection there is the Caribbean Food Corporation which has taken a long time to get started. There are also 2 grain legume/cereal projects (one each in Guyana and Belize) which have taken a very long time to get started.

4.3 It was hoped to obtain important information from the Director and Deputy Director of the Agricultural Projects Division, but both were unavailable - (Dr. L. Campbell the Director, was indisposed). The information available related largely to the revised project titled:

> "Proposal for Allocation of Grant Funds to a Pilot Commercial Peanut Cultivation, Harvesting and Marketing Project for the Less Developed Territories of CARICOM".

4.3.1 In the absence of the author of this project, very little discussion was possible. The final draft of the project was prepared on July 1979.

Several issues arose from the "project". Some of the main aspects are presented in the sections which follow:

4.4 <u>The CDB proposals for creating "Regionally Integrated Peanut Industries</u>

4.4.1 This project arose largely from a mandate from the 11th Meeting of the Eastern Caribbean Common Market (ECCM) held in St. Kitts in 1976, for the establishment of a regionally integrated peanut industry for the LDCs. This recognized the large regional demand for peanut and the importance peanut plays as a source of protein in the diets of the Caribbean people, as well as its potential value as a small farmer crop.

4.4.2 The data available indicate that there has been a considerable decline in production in the main LDC peanut producers of the CARICOM area. The major reasons for the decline were stated to be:

(i) Lands being put into better alternative crops over the years - for example bananas, produced mainly by small and medium farmers; and

(ii) "increasing costs of production, relatively poor quality yields derived from the common use of unimproved varieties and low levels of cultural practices; cultivation in small plots in hilly lands with complete dependence on manual harvesting, and the uneconomic prices received for exports in competition with extra-regional imports which make it unprofitable for farmers to produce peanuts".

4.4.3 An examination of the CDB proposals which present a revised version of the October 1978 proposals indicate that although reference is made to regional integrated peanut industries, by design the intention is to have a project whose scope is very limited. As a consequence the document lacked the depth of information necessary for examining a regional project in its entirety, as was envisaged in the Food Plan.

4.4.4 Given the above limitations it is evident that the proposals themselves were intended to cover a small part only of the total regional requirements and production. In this context it will be observed that the proposals make no mention of the large quantities of extra-regional imports of ingredients for the manufacture of cooking oils, baby foods, soups, and animal feeds.

Indeed the stated objective of the project is "to provide a structured approach to developing the peanut industry in 4 selected LDCs".

4.4.5 The proposals make no mention either of the potential which exists in the MDCs for developing peanut industries, and this essentially is the point of departure where the detailed analysis of the Jamaica proposals begin.

4.4.6 In view of the fact that the CDB had prepared the above cited project, it was hoped to be able to obtain information on a regional basis relating to peanut industries. This was unfortunately not possible.

5. Discussions with Victor Ojeda: Agricultural Economist, IICA/Barbados

5.1 Mr. Ojeda has been in Barbados for only a short while and so was unable to produce information in depth concerning the Peanut Industry - He has been working in close liaison with MINAG staff and provided a number of references to action proposed by the Barbados Government.

5.2 Specific references were made to the Ministry of Agriculture Food and Consumer Affairs/Planning Unit/FAO Projects (as yet provisional). The main information provided in excerpts from the studies indicated.

5.2.1 Peanut production decreased considerably from 1974 to 1975 after an equally steep increase from 1968 to 1973.

5.2.2 Reasons have been attributed to the withdrawal of land from peanut production, marketing problems and unsuitability of the varieties available.

5.2.3 A basic paper setting out the Groundnut (= Peanut) position from 1968 to 1975 was provided. It included steps to be pursued for development of the peanut industry:

(a) Strengthening actual peanut production to supply the domestic fresh market (unshelled) -

Proposed Requirements:- Technical assistance production incentives and organizing producers into a co-operative. Four main tools - ADC processing facilities; import licensing; statistical procedures and storage.

(b) Second Step - Development to meet local demand for shelled (non-roasted) peanuts.

(c) Third Step - Establishment of processing facilities to roast and salt peanuts, and further development of peanut production for the CARICOM trade.

5.2.4 The success of the actions pursued in the 3 steps listed in 5.2.3 would depend on further research and studies with respect to:

- farming systems including peanuts:
- projected production costs and prices
- marketing opportunities (seasonal demand, quality of produce, shipping etc.)
- setting up of an integrated marketing and pricing policy.

B. ASSESSMENT OF THE PEANUT SITUATION IN TRINIDAD

6. Discussions with Staff, Ministry of Agriculture, Trinidad & Tobago

6.1 The overall situation is that Trinidad and Tobago produce no peanuts. There is a large consumption of salted nuts and "semi-processed" peanut products. Trinidad has an export market in CARICOM countries for these same products, the manufacture of which is based entirely on extra-regional imports of peanuts.

6.2 It was the consensus that the Jamaica study proposals would provide no conflict with existing proposals for regional expansion by way of pilot projects in 4 LDCs which will be grant-aided by the CDB and implemented by CARDI.

6.3 Although a technical package of procedures had been worked out for Trinidad's small farmers, Trinidad has not included any proposal for the development of a peanut industry in its White Paper for Agriculture. Additionally, Trinidad does not have plant facilities for oil extractions.

6.4 Trinidad produces large quantities of broiler meat largely on non-CARICOM feed imports. The details of imports were not immediately available but it was the view that peanut produced regionally on a structured basis and at competitive prices could replace some of these imports.

6.5 The Chaguaramas Project - in Trinidad is a Government project which was used for the production on commercial field scales of soya bean, corn, black eye peas. The project results have indicated that these crops can be produced efficiently. However, Trinidad is not promoting the production of crops such as soya bean (yields of 1,500 lb per acre recorded at Chaguaramas).

The project, which used mechanical tillage as the main means for preparing land, was essentially a seed farm operation. Soya bean produced was used largely by a small number of local farmers as well as for export to other Caribbean islands. Little or no information is available on costs of production. A proper basis has not been established for making any comments concerning the competitive position of peanuts vis-a-vis other crops such as soya beans.

7. Discussion with Lennox Assang - Managing Director of Holiday Foods, San Juan

7.1 Holiday Foods Limited used to import peanuts from St. Vincent. Quality was good but prices were too high. Additionally, production had been reserved by arrangement, for Guyana, thereby limiting the quantity available for Trinidad. The peanuts were available in shell and Holiday Foods Limited has no facilities for shelling.

7.2 Holiday Foods Limited uses approximately 1,000 tons of shelled peanuts and 75 - 100 tons of unshelled peanuts annually. The peanuts required must be large, (variety - Virginia Fancy) and should have "white" skins.

7.3 St. Kitts used to supply a part of this requirement, but this was on a rather haphazard basis. Price was too high, quality of kernel was good but small and not white skinned - essentially therefore this created quality and price constraints. Proper variety had to be specially bred.

7.4 Trinidad produces no peanuts that could be made available for processing, thus Holiday Foods Limited depends largely on supplies from USA, India and Africa.

Prices: $1.00 - $1.10 (TT) per lb shelled
In shell: $1.15 - $1.25 per lb

In addition these imported raw materials attracted duty-free concessions for manufacturing purposes.

7.5 Uses:

- Baked in the shell
- Fried and salted for the production of cocktail products
- Peanut punches, peanut butter, ice crea peanut brittle

7.6 Supplies from the USA are completely free of aflatoxin. Trinidad prefers to import from India rather than from Africa, since the latter takes no steps to present peanuts in an appealing manner.

8. Discussions with Professor L. Wilson, University of the of the West Indies

8.1 U.W.I. Faculty of Agriculture is undertaking research projects in grain legumes for human food and also for livestock feed.

8.2 There is still a need to sort out priorities and determine the appropriate selections e.g. soya bean, peanuts, pigeon peas etc.

8.3 Work undertaken by the UWI depends largely on funding, and on the availability of technical staff both at the University and within the countries which are expected to benefit from the work being done.

8.4 UWI's emphasis is on teaching, thus the research efforts must be left with CARDI.

8.5 Trinidad has just created a Food and Agriculture Corporation, a holding Company intended to effect and ensure proper co-ordination between agencies engaged in agriculture in Trinidad.

8.6 So far as peanuts are concerned while CARDI had worked out a Technical package of practices for Trinidad, the UWI had been requested to accept responsibility for determining the technical aspects of harvesting, shelling and drying. The UWI has not yet tested a harvester although it has started to fabricate a 'cheap' structure for small and medium size farms (that is up to 10 acres).

9. Discussions with Dr. S. Haque - CARDI

9.1 A technical package for peanuts has been worked out for Trinidad largely due to convenience, but the package is intended to assist the 4 LDCs in developing their peanut pilot projects.

9.2 Dr. Haque is currently updating this work and finalising a technical package of practices which is expected to make a useful contribution to the production of peanuts in the region. He is also the author of "Know Your Peanut".

9.3 The main inputs in any programme for developing the regional peanut industry should include the following:

9.3.1 Information on varieties and yields - inclusive of suitable quality (size, colour, etc.) to meet consumer requirements.

9.3.2 Technical package for the transfer of information to farmers, including steps to provide suitably trained extension staff.

9.3.3 Availability of certified seeds and other key inputs - special measures should be taken to provide these.

9.3.4 Land availability - inclusive of providing the right soil types for production.

9.3.5 Cost/price relationships.

9.3.6 Appropriate storage and marketing of product.

10. Discussions with Armando Reyes, Director, IICA/Trinidad Office

Mr. Reyes accompanied the author on his visit to the UWI (Prof. L. Wilson) and CARDI (Dr. S. Haque). He participated fully in the discussions, the salient points of which are listed in Sections 8 and 9.

10.1 Further discussions related to the view that Trinidad is not engaged in peanut production to any significant degree but that on the basis of consumption it will continue to require increasing quantities of peanuts for semi-processing largely. It was apparent that this factor together with other information gained from MINAG staff indicates clearly that Trinidad will remain essentially an importer of peanuts and provided the quality & price are right, should provide a regional market for other CARICOM countries.

10.2 Mr. Reyes sought information on the possibilities for expanding peanut production in Jamaica. The author indicated that on the steep lands being farmed, given certain soil types and other favourable conditions the FSB project at Allsides has shown a real potential for increasing peanut production with enhanced advantage to many. He further indicated the potential for production to reach the stage where sophisticated processing such as oil extraction can be accommodated. The price of peanut in a mixed cropping system should make processing a distinct possibility.

10.3 Apart from the Allsides project, the author indicated that consideration would be given to including

cropping systems having peanuts as an intercrop into the GOJ/IDB/IICA project. Mr. Reyes displayed more than passing interest in this project - its identification, formulation, methological inputs and hoped that the implementation would be successful.

11. CONCLUSIONS

On the basis of the information gathered from available data and during discussions the following are the main findings:

11.1 production of peanuts in the region is considerably below the potential demand;

11.2 all proposals to date have considered the demand for peanuts in a very limited manner, ignoring completely peanut oil, the large quantities of peanut meal imported for the manufacture of animal feeds, as well as the ability to substitute imported ingredients for the manufacture of baby foods, and soups.

11.3 the potential for the development of a peanut industry for the region has not been appropriately examined, and consists largely of the CDB proposed 50-acre pilot projects in 4 selected LDCs.

11.4 many of the LDCs and even the MDCs have a land constraint where peanut production is concerned.

11.5 Barbados has proposals for expanding its peanut industry but does not have processing facilities.

11.6 Jamaica is at present the largest producer of peanuts in the region and has the scope for much greater production than obtains at present. Its present proposals are well conceived and should be pursued.

11.7 with respect to (11.2), these proposals deal almost entirely with production for regional consumption and give no consideration to the possibilities for export, given appropriate cost/price relationships.

11.8 the data and information necessary for regional development are inadequate in many respects, and in some instances appropriate data are not available. This applies particularly to the CARICOM Secretariat and the CDB.

11.9 the technical inputs need to be formalized. CARDI (S. Haque) has taken steps in this direction and an updated technical package is promised within another month's time.

11.10 an important factor associated with 11.9 is the provision of trained technicians.

11.11 appropriate varieties and the availability of certified seeds will pose a problem during the early stages of any proposed developmental programme.

11.12 appropriate cropping systems must be worked out as part of the technical package adopted for each producing country.

12. SUPPORT FOR THE JAMAICA PROJECT

On the results of the visit, it was the consensus that:

12.1 the Jamaica proposals are well-based and timely.

12.2 these proposals will in no way affect proposals for the development of peanut industries elsewhere in the CARICOM countries at regional and national levels for the reasons that:

(i) local and regional supplies are completely inadequate for national and regional needs;

(ii) local production can be economically viable under existing cost/price relationships;

(iii) farm incomes can be increased by expanding the production of peanuts.

(iv) foreign exchange savings can be achieved;

(v) cropping systems being developed favour the expansion of the local peanut industry; and

(vi) largely because of (v) land constraints will be a less critical factor.

13. ACKNOWLEDGEMENTS

The author wishes to thank the many persons who assisted in helping to meet the objectives set out for this activity. While it is regretted that both in Barbados and in Trinidad it was not possible to contact all the persons desired, other persons were able to provide much of the relevant information necessary for determining the extent if any to which there would be a conflict arising from the Jamaican proposals.

14. LIST OF PERSONS CONTACTED:

Barbados

Dr. Warren Forsythe, Director, IICA/Barbados Mission
Mr. Victor Ojeda, Agricultural Economist, IICA/ Barbados Mission
Dr. Don Walmsley, Leader, CARDI Mission in Barbados
Mr. F.A.R. Mullings, Director
Miss Joan Ferguson
Mr. Arnold Cruickshank

Trinidad

Mr. Armando Reyes, Director, IICA/Trinidad Mission
Dr. E. Patrick Alleyne, Acting Permanent Secretary, MINAG

Mr. R. Rampersad, Co-ordinator of Development Programmes
Chairman, IICA/MINAG (Trinidad) Coordinating Committee
Mr. George Buckmire, Economist, Member of Coordinating Committee
Mr. Foster Bissessar, Director of Planning, MINAG
Mr. Lennox Assang, General Manager, Holiday Foods Ltd.
Dr. S. A. Haque, Leader of CARDI Team in Trinidad
Prof. L. Wilson, Dept. of Crops and Soils, Faculty of Agriculture, U.W.I. St. Augustine
Dr. Lloyd Rankine, Dept. of Crops and Soils, Faculty of Agriculture, U.W.I. St. Augustine

SIGNED: Irving E. Johnson
20/11/79

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ANNEX #2

TRIP REPORT (27/10/79 - 3/11/79)

by ABDUL H. WAHAB

ASSESSMENT OF PEANUT PRODUCTION AND DEMAND IN GUYANA

Principal Results Achieved

1. Through discussions with a number of Government, Private and International organizations the following information was obtained.

1.1.1 Guyana's production of peanuts falls considerably behind its demand for raw, roasted and parched nuts.

1.1.2 Guyana has traditionally imported large quantities of peanuts to satisfy the "snack food" market from India, Africa and North America.

1.1.3 Thus far in 1979 there has been no import of peanuts due to an acute shortage of foreign exchange.

1.1.4 Notwithstanding a gradual increase in production over the past decade, at present production acreage does not exceed 500 acres per year.

1.1.5 To satisfy the country's present need for parched, raw roasted and other derivatives such as vegetable oils and peanut meal, about 75,000 acres will have to be planted to peanut per year.

1.1.6 Guyana is well endowed with vast areas of suitable soil types and climate for both intensive and extensive cultivation of peanuts. However, these areas are located in Wauna-Yarakita region of North West where present infra-structural facilities are poorly developed.

1.1.7 Present cost of producing peanut in Guyana as estimated by the author could range from G $1.25 - 1.50 per pound assuming a yield of 1,200 pounds per acre of unshelled nuts, and non-subsidized prices of chemical inputs. 1/

1/ G $ = U.S. $ .39

1.1.8 Present farm gate and consumer prices for unshelled peanuts are $4 - 4.50 and $5.00 per pound respectively.

1.1.9 Current consumer prices for parched unshelled nuts and peanut butter are $8.00 and $6.25 per pound respectively. Current consumer prices for parched unshelled nuts and peanut butter are $8.00 and $6.25 per pound respectively.

1.1.10 The Guyana Government has indicated that there are no immediate plans for extensive expansion of the peanut industry.

1.2 Due to the absence from Guyana of the agricultural sector representative to CARICOM, it was not possible to hold discussions vis a vis the regional supply and demand situation of peanuts.

2. Follow-up Action Required and Recommendations

2.1 The IICA/Jamaica unit should proceed without delay to prepare a project document for expansion of the peanut industry in Jamaica.

2.2 The Guyana unit may also consider preparing a project for expansion of the peanut industry there.

2.3 Cognizant of the great demand for peanuts and its derivative products in the CARICOM region, expansion of the industry in both Guyana and Jamaica could serve to significantly alleviate the adverse balance of payments situation being experienced by both countries.

3. Organizations and Persons Contacted

IICA - Dr. Hector Barreyro - Director
- Dr. Reginald Pierre - Production Specialist
- Mr. Jerry La Gra - Marketing Specialist
- Mr. Mario Franca - Agricultural Economist

Ministry of Agriculture

- Mr. Irwin Telfer - Deputy Chief Agricultural Officer
- Mr. John Browman - Acting Chief Agricultural Officer
- Mr. Mohammed Naseer - Principal Agricultural Officer, Resource Development and Planning.
- Mr. Mohanram Sukhdeo - Agricultural Technical Assistant
- Mr. Ted Hubbard - Principal Agricultural Officer-Crops
- Mr. Julius Ross - Agricultural Officer, Legumes.

State Planning Secretariat

- Mr. Clyde Roopchand - Planner

Guyana Cooperative Agricultural & Industrial Development Bank

- Mr. wilton Spencer - Credit Analyst based Wauna

CARICOM Corn and Soya Regional Company

- Mr. Jack Dummett - Project Manager

Guyana Stockfeeds Limited

- Mr. Pooran - General Manager

Squirrell Manufacturing Industry

- Mr. Raymond Harrison - Manager

Guyana Sugar Corporation (Guysuco)

- Mr. Vibart Young-Kong - Agriculture Director
- Professor Egbert Tai - Agricultural Advisor
- Dr. Gordon Mueller - Other Crops Division
- Mr. Charles Lawrence - Other Crops Division

Guyana Pharmaceutical Corporation

- Dr. Leslie Chin - Manager

USAID

- Mr. Eric G. Wright - Consultant to Experience Incorporated

CARDI

- Mr. Roland Fletcher - Director, Guyana Office

ATTACHMENT A

4. WORK ACCOMPLISHED

4.1 During the discussions it became apparent that the Guyana unit did not fully grasp the purpose of the study being undertaken by the IICA/Jamaica office staff. For this reason, the author gave an expose on the nature of the activity stressing the need to obtain the demand - supply levels of peanuts in Guyana as well as for the other CARICOM member states in order to propose a strategy for expanded production of this crop in the region.

4.2 The IICA office Director expressed concern that the information being sought could be classified as sensitive by National authorities. He therefore suggested that the author be cautious in his interviews and conduct them in a delicate manner. He further observed that if as a result of the study, it was proposed to expand peanut production in Jamaica, the peanut industry in Guyana could be adversely affected. While the author took full cognizance of this observation, it became abundantly clear at the end of the week that peanut production in Guyana will have to be increased several hundred fold if the local demand is to be satisfied.

4.3 Mr. Jerry La Gra expressed the view that the peanut industry in the Dominican Republic is very highly developed. For this reason the Jamaica staff should become au fait with this experience. He also pointed out that within the recent past IICA supported graduate work leading to the Masters Degree on various aspects of peanut production in the Caribbean. However, special emphasis was placed on the Dominican Republic. These studies were conducted under the supervision of Dr. Ames of the University of Georgia. Mr. La Gra volunteered to send relevant information on the study upon his return to the Dominican Republic. The author will also contact Dr. Ames with the aim of obtaining more specific information.

4.4 Dr. Reggie Pierre speaking on Agronomic and Production aspects stated that the popular variety of peanuts grown in Guyana is AK62, which was introduced from Florida and is of the Valencia type.

4.4.1 In his work on peanuts in Jamaica he found var. N.C.2 to be one of the best for eating.

4.4.2 Estimated total acreage cultivated in Peanut in 1978 in Guyana was just 1210 acres (490 ha), which yielded 1.2 million pounds or 992 pounds per acre (1112 kg/ha), of unshelled peanuts.

4.5 Courtesy of the Guyana unit, the author extracted from one of its working documents the following estimates on peanut production in Guyana for the period 1968 - 1978.

YEAR	lbs x 10^3	% Increase over 1968
1968	50	-
1969	64	28
1970	75	50
1971	138	176
1972	151	202
1973	145	190
1974	250	400
1975	250	400
1976	250	400
1977	N.A.	N.A.
1978	N.A.	N.A.

Source: IICA/Guyana Studies (Information Table about Guyana, May 1979).

4.6 Following the discussion with IICA staff, a courtesy call was made on Mr. Irwin Telfer, Deputy Chief Technical Officer, Ministry of Agriculture. This visit was made in the company of:
Mr. Hector Ba-reyro,
Mr. Jerry La Gra

4.6.1 Inter alia Mr. Telfer stated that in Guyana:

- Efforts at peanut production are modest.
- Peanut prices are not controlled by Government
- Prices presently received by the producer vary from $4.00 to $4.50 1/ per pound for unshelled sun-dried peanuts.

4.6.2 Mr. Telfer suggested that the information being sought could be obtained from:

Messrs.

- Mohammed Naseer, Principal Agricultural Officer, Resource Development and Planning MINAG, and
- Julius Ross, Agricultural Officer and Agronomist (Legumes) MINAG.

4.6.3 Following the meeting with Mr. Telfer the author arranged meetings with the personnel mentioned at 4.6.2

4.7 Discussions with Mr. Julius Ross, at the Central Agricultural Experiment Station, Mon Repos, accompanied by Reginald Pierre.

4.7.1 The author briefed Mr. Ross on the background of the exercise. Mr. Ross assured us of his full cooperation. However, due to another unplanned staff meeting requiring Mr. Ross' attendance, discussions with him were postponed.

4.7.2 The author was shown GOG/IICA experimental work on "Screening for Varietal resistance to the Cowpea Mosiac Virus", and Cercospora infested leaves of the black eye pea.

4.8 Visit with Mr. Jack Dummett, Project Manager, CARICOM Corn and Soya Regional Company.

4.8.1 This company was established in January 1977 by the Governments of Guyana and Trinidad and Tobago. It was envisaged at first that corn and soya would be grown on 10,000 acres of

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1/ Unless otherwise stated all prices are expressed in Guyana Dollars. One Guyana Dollar is equal U.S. $.39 or U.S. Dollar equals Guyana $2.56

sandy loam soils belonging to the 810 and 820 soil types located at Kibilibiri Berbice River. Cropped twice per year this meant that corn and soya from 20,000 acres could have allowed for a reduction in imports of these products into the CARICOM region. The operations of the Company are highly Capitalized and Mechanized due to unavailability of hired labour. Also, there was a tendency to cultivate extensively rather than intensively.

4.8.2 Experience over the past three years indicates that there are serious constraints to:

- Level of production
- Level of yield
- Economic Viability of the company

4.8.3 Inter alia problems of unavailability of (1) Good seed material; (2) Irrigation facilities and (3) Appropriate technology for the management of these rather marginal to poor soils have resulted in a drastic reduction in the total acreage.

4.8.4 Among the crops planted, the manager of the project believes that while corn is definitely unprofitable, the Pigeon Pea (Cajanus cajan) is likely to succeed.

4.8.5 While cognizance is taken of the need to employ a vigorous research and development programme to run in tandem with production, this company is unable to do so due to its charter.

4.8.6 Although peanut is suited to the soil type and is drought tolerant, this crop cannot be cultivated unless the policy makers seek additional financial resources for the provision of equipment specially designed for it i.e. harvesters, drying facilities etc.

4.9 Meeting with Messrs:

- Mohammed Naseer, Principal Agricultural Officer
- Mohanram Sukhdeo, Agricultural Technical Assistant both of the Resource Development and Planning Division MINAG.

4.9.1 These gentlemen expressed the view that in the context of peanut production the bulk of what reaches the consumer (i.e. salted or parched nuts) is grown by small farmers in the Wauna - Barima area of the North West Region.

4.9.2 Information pertaining to acreages of certain field crops planted in the various agricultural regions of Guyana in 1976 is presented thus. 1/

TOTAL PRODUCTION 1 2 3 4 5 6

CROP ACREAGE	Hosororo Moruca Mattews Ridge Kaituma	Essequibo coast " Isl. E.B.Essequibo W. Demerara Pomeroon	E.C.Dem E.B.Dem Soes dyke Linden Highway Dem. Rv. W/B'ce	E.B'ce B.B.P. B'ee River	Mazaruni Potaro District	Rupununi
Blackeye peas	841	20	100	263	368 40	50
Corn	1259	710	18	38	433 -	60
Peanuts	508	351	-	7	- 72	78

E. B'ce stands for East Berbice. B.B.P. stands for Black Bush Polden E.C. Dem stands for East Cost Demerara. E.B. stands for East Bank Demerera. W. Dem stands for West Demerara.

1/ Source: Cost of Production studies of some major Agricultural Products, Planning Division, Ministry of Agriculture, Dec., 1977.

4.9.4 In 1976, Peanuts ranked lowest among the commonly grown annual field crops in Guyana. Of a total of 2,600 production acres planted to Blackeye peas, corn and peanuts only 20% was cropped to peanuts. Also 70% of the peanut acreage was located in the North West Region of the country whereas 30% was grown in the central to Southern regions.

The reason for this production distribution pattern is that the fertile coastal clays are much too heavy-textured for the growing of peanuts. However, in the Wauna - Barima (North West Region) and Mazaruni, Potaro, Rupununi areas soil textures range from sands to sandy loams to sandy clays which are ideally suited for peanut production given favourable weather conditions.

4.9.5 Information prepared by the MINAG personnel in December 1977 relating to yields, farm gate prices and cost of production of several field crops are summarized thus:

CROP	lbs/acre/year
Black-eye peas	700-1000
Corn	3500-5000
Peanuts	800-1200 unshelled nuts

Farm gate prices for the period of 1970-1976 (cents/lb)

CROP	1970	1971	1972	1973	1974	1975	1976
Red Kidney Bean	31.4	28.0	27.5	23.0	23.0	58.0	60.0
Black-eye peas	27.0	25.1	27.9	41.8	45.0	58.0	53.0
Peanuts *	-	-	-	35.0	77.0	95.0	80.0

* Data obtained in 1978 show that with average yields ranging from 500 - 1200 lb/acre, the then farm gate price was $2.30 lb for unshelled nuts.

4.9.5 Production Costs for 1976

CROP	TOTAL COST (lb)	AVERAGE YIELD (lbs)	COST PER lb (h)
Peanut	788.70	1000	78.9
Corn	290.40	1500	19.4
Black-eye peas	500.35	800	62.5
Red Kidney Beans	540.35	800	67.6

Shown in attachment B is a detailed breakdown of the production cost of Peanuts in Guyana.

4.9.6 From the above it can be noted that in Guyana costs of producing legumes are several times greater than those of producing corn. Among the legumes, peanuts cost significantly greater to produce because of the relatively small acreage devoted to the peanut. Peanut prices to the producer and consumer at the time of writing this report ranged from:

- $4 - 5.00/lb to the producer;
- $6 - 6.50/lb to the consumer for raw unshelled nuts;
- $8 - 9.00/lb to the consumer for parched unshelled nuts.

4.9.7 The question is thus posed, why are not more peanuts grown since the crop is lucrative. The author was told that most of the producers are small farmers who cannot physically cope with plot sizes exceeding two acres, since the harvesting operations and subsequent pod separation are done by hand labour. Also due to (1) a relatively static population of farm settlers in the Wauna area; (2) Lack of adequate infrastructure to ensure reliability of supplies of inputs and transportation of produce to the market place and (3) Unavailability of farm labour, acreage of peanut production has not increased significantly over the recent past.

4.10 Visit with Mr. Julius Ross, Agricultural officer (legumes) MINAG, stationed at the Central Agricultural Experiment Station Mon Repos.

4.10.1 Mr. Ross stated that notwithstanding Government's intensive programme of increased grain legume production the main objectives of which are to reduce imports and supplement animal protein consumption, peanut because of its principal use as a diet and snack food has not been promoted as vigorously as Black-eye pea (Cowpea var. cal 5).

4.10.2 Nevertheless, the country until 1978, continued to import substantially higher quantities of raw shelled peanut than it produced, mainly from India and Nigeria. Other countries which supplied peanuts to Guyana in relatively small quantities were Canada and the U.S.A. Due to an acute shortage of foreign exchange, peanuts have not been imported by Guyana so far in 1979.

4.10.3 It is estimated that in 1978, the consumption of shelled peanuts was 5,000,000 kg of which 73,000 kg was locally produced.

4.10.4 Because peanuts are ecologically suited to the climate and soils of the "intermediate savannahs (an area of about 300,000 acres lying immediately Southwest of the Coastal belt in Northwest Guyana) Government in co-operation with USAID and the University of Florida conducted research and developmental work aimed at determining a suitable variety and technological package for peanut production.

4.10.4.1 These efforts resulted in the release in 1972 of the variety Altika which gave experimental yields of 3,500 lb/acre unshelled peanuts when planted in the long rainy season (Mid-April through August). The local variety AK62, out-yielded Altika during the short rainy season.

4.10.4.2 For acceptable yields soils have to be managed intensively employing heavy inputs of fertilizers, soil amendments and minor elements (mainly because of the inherently low fertility and unfavourable soil reaction of the sands and sandy loams which are also characterized by a low exchange capacity rating and low base saturation.)

4.10.4.3 Perhaps the most undesirable feature of the Altika variety is that it has a dormancy period of at least 75 days after maturity before it will germinate under average field conditions. In contrast the local variety AK62, does not exhibit seed dormancy and will germinate when mature if soil moisture

conditions are favourable. It is not surprising therefore, that despite the demonstrated high yield potential of Altika, farmers continue to plant the local variety AK62.

4.10.4.4 Unfortunately, due to unavailability of certified seed material this variety has been declining in yields from 1.2 ton/hg to 900 Kg/ha now. Unless efforts are made to multiply foundation seed material yields will continue to decline to uneconomic levels.

4.10.5 Further discussions with Mr. Ross indicated that the small farmer has proven more reliable and successful than the bigger operators and state agricultural enterprises in adopting new crops and practices in Government's crop diversification programmes. For this reason every effort is being made to get badly needed inputs such as seed material, seed inoculant, fertilizers and chemicals to the small operator.

4.10.6 Together with Mr. Ross the author worked out the present cost of peanut production by the small farmer who operates in the North West Region. Using the prevailing fertilizer prices to farmers which are heavily subsidized by Government, a production cost of $600.00 per acre was obtained for an expected yield of 800 pounds of unshelled material.

4.10.7 On the subject of expansion in the peanut industry Mr. Ross stated that there has been a commitment by the State Sugar Corporation, Guysuco, to include in its Other Crops Programme the cultivation of peanuts. Subsequent discussions with functionaires of Guysuco, indicated that they have projected an acreage of 40 acres to be planted to peanuts by December 31, 1979.

4.10.8 A joint project by the Government and USAID on seed production and seed certification should serve to remove one serious constraint to crop yields. This project has just commenced and one full-time consultant in Seed Technology in the person of Mr. Eric S. Wright of Experience Incorporated has already arrived in Guyana.

4.11 Visit with Mr. Eric S. Wright of Experience Incorporated assigned to Guyana to provide technical advice for thirty months on **inter alia.**

4.11.1 Best locations for production of different kinds of vegetable seeds and field crops including peanuts.

4.11.2 Identification of food crops suitable for seed multiplication under Guyana conditions.

4.11.3 Production of vegetable seed.

4.11.4 In-Service Training of personnel working on seed programme.

4.11.5 Management of the "Seed Production and Processing Section" of MINAG, which is to be set up as a separate entity from the Central Agricultural Station.

4.12 Visit with Professor Egbert Tai, Advisor, Guyana Sugar Corporation Limited.

4.12.1 Discussions relating to peanuts indicated that Guyana had intercropped peanuts with oil palm in the Waunna area. The average acreage was not known, neither was Guysuco's position vis a vis the cultivation of peanuts.

4.12.2 Dr. Tai clearly stated that due to the heavy clays, it was not planned to produce peanuts on the Sugar Estates.

4.13 Meeting with Mr. Mohanram Sukhdeo, Technical Assistant, Resource Development and Planning Division, MINAG.

4.13.1 This meeting was a follow-up to discussions held with Mr. Sukhdeo during which peanut imports for the five year period 1974 - 1978 were promised. Shown below are imports and cost (C.I.F.) in Guyana dollars.

IMPORTS OF PEANUTS (lbs) FOR USES OTHER THAN OIL FOR THE PERIOD 1974-1978

YEAR		LBS	VALUE G$	COST PER LB
1974	Shelled Peanut	162,176	134,445	.83
	Unshelled Peanut	549,551	241,163	.44
	Ground Nuts	46,650	48,096	1.03
1975	Shelled Peanut	N.A.	-	-
	Unshelled Peanut	196,973	202,480	1.03
	Ground Nuts	-	-	-
1976	Shelled Peanut	N.A.	-	-
	Unshelled Peanut	204,280	282,830	1.38
	Ground Nuts	432,021	503,102	1.16
1977	Shelled Peanut	531,496	635,305	1.20
	Unshelled Peanut	80,000	66,082	.82
	Ground Nuts	-	-	-
1978	Shelled Peanut	119,205	167,884	1.41
	Unshelled Peanut	510,711	323,092	.63
	Ground Nuts	-	-	-

4.13.2 Source of Imports

In 1977 Guyana imported a total of 266 short tons of Shelled Peanuts from:

		C.I.F. G$ per lb
U. S. A.	16.43 tons	1.35
Brazil	0.52	1.22
Egypt	87.90	1.27
Gambia	24.42	1.24
Malawi	61.60	1.23
Zambia	19.80	0.77
India	46.13	1.11
TOTAL	266.00	635.305

As detailed above Egypt, Malawi and India accounted for 33, 23 and 17% respectively of the total imports for the year, with CIF prices ranging from 77 cents to $1.24 per pound. Further, over the five year period (1974 - 1978) Guyana imported 1414 tons of peanuts valued at G $2,604,479. The author was also informed that during this period no peanuts were available for purchase from the CARICOM market. Also, due to scarcity of foreign exchange there has so far been no imports for 1979.

4.13.3 Based on the import figures for 1974 - 1978 it is calculated that on an average yield of 800 pounds of unshelled nuts per acre, Guyana will have to expand production acreage by about 700 acres at the least to satisfy the demand for salted, parched and peanut butter, not taking into account the potential increase in demand if peanut imports were not limited by foreign exchange constraints.

4.14 Meeting with Mr. Clyde Roopchand, Planner State Planning Secretariat, Government of Guyana.

4.14.1 Mr. Roopchand stated that due to the current restriction on imports of peanuts, the present high price structure of peanuts is an artificial one dictated largely by the price that the consumer is willing to pay. The Guyana Marketing Corporation (GMC) presently offers a guaranteed price of $1.50 per pound. However, due to the high farm gate prices offered by wholesalers ($4 - $4.50 per pound) virtually no peanut is currently handled by the G.M.C.

4.14.2 Current Prices The author conducted a brief survey in the retail outlets in Georgetown to determine the current prices of raw unshelled peanuts, parched unshelled peanuts, shelled parched peanuts and peanut butter. Results of this survey are summarized thus:

	Aug Price G $/lb
- Raw unshelled peanuts	5.50
- Parched unshelled peanuts	8.00
- Parched shelled peanuts	N.A.
- Peanut Butter	6.25 *

* The percent of peanut in the formulation which consisted of peanut, sugar, salt and stabilizer could not be ascertained.

4.14.3 Mr. Roopchand informed the author of the proposed expansion of peanut acreage in the Port Kaituma area (North West Region) under the MATARKAI Agricultural Plan. According to this Plan it is envisaged that 446 acres of virgin and secondary forest will be brought under cultivation by October 1980. Of this acreage only 36 is slated to be planted to peanuts.

In the project document prepared for this development, estimated cost of production of one acre of peanut at a yield level of 1,200 pounds is $1,308.09. However, when fertilizer and chemical inputs are costed at non-subsidized prices, the author estimates that a more realistic cost of production computed at current prices would approximate G $1,700.00 or $1.42 per pound of unshelled nuts.

4.14.4 Also brought to the attention of the author is the on-going Oil Palm Project which is sited in the Wauna-Yarakita area of the North West Region. This project commenced in 1972 and it was envisaged that by 1976 1,000 acres would have been established which was projected to yield about 450 tons of refined oil to satisfy home consumption which averaged 5,589 tons refined oil equivalent over the years 1970 - 1973.

Additionally, when cognizance is taken of CARICOM'S imports of vegetable oils (estimated by the author to be in the region of 22,000 tons currently), it can be seen that even when the Oil Palm Project attains stabilization point of approximately 1,400 tons of oil 1/ there will still remain a considerable deficit which could be filled by expanding production of peanuts, coconut and soyabean.

1/ Technical and Economic Feasibility of the Oil Palm Project - Wauna NWD Ministry of Agriculture, Georgetown Guyana, November 1974.

4.14.5 The State Planner Mr. Roopchand discussed at length proposals for a Land Settlement Project at Paruima. [1/] This area is located in the Upper Mazaruni District, and settled by about 400 inhabitants most of whom are Arekuma Indians. If funded and targets achieved net farm income is projected at $3,000. The soils at Paruima are among the most fertile in Guyana and ideally suited for production of White Potato (which has been removed from the import list since 1973) and peanuts. The project was also predicated inter alia on the large quantities of peanuts imported by Guyana over the period 1968 - 1973 as shown below:

YEAR	IMPORTS OF PEANUTS QUANTITY lbs.	VALUE G $	PRICE PER lb G $
1968	1,052,026	324,400	0.31
1969	973,746	350,571	0.36
1970	703,505	276,832	0.39
1971	803,200	320,784	0.40
1972	723,699	340,596	0.47
1973	845,271	626,962	0.74

Source: Resource Development and Planning Division, MINAG 1976.

4.14.5.1 It was envisaged that the project area would encompass 500 acres of cultivable land and that each farm family would be settled on 10 acres. The total cost of the project was $0.5 M to be repaid over a 5-year period.

1/ Pre-Feasibility study of the Peanut/White Potato Land Settlement Project at PARUIMA by Winston Smith, Agricultural Economist, Resource Development & Planning Division, MINAG, April 1976.

The success of the project would have rested to a large extent on the acceptance of adoption of improved agronomic practices by the indigenous Amerindian community.

Notwithstanding its many attractive features, this Project has so far failed to obtain funding both from internal and external agencies.

4.15 Meeting with Mr. Roland Fletcher, Office Director, CARDI.

4.15.1 Discussions indicated that:
CARDI is not presently working on peanuts in Guyana, but may become involved in the future on small farmers' holdings in the riverain areas.

4.15.2 Guyana has not been selected among the CARICOM States for the proposed 50 acre peanut pilot trial aimed at testing the CARDI developed technological package.

4.15.3 In Guyana, the Wauna-Yarakita area has the best potential for a programme of expanded peanut production.

4.15.4 If production is expanded to exceed the demand for fresh and parched nuts, peanuts can then be processed into vegetable oils and protein meal, both of which are imported in large quantities.

4.16 Meeting with Mr. Wilton Spencer, Credit Analyst, Guyana Cooperative Agricultural and Industrial Development Bank.

These discussions were extremely useful, in that the writer obtained information on the status quo of the peanut industry at Wauna. Mr. Spencer had just arrived in Georgetown from Wauna. Salient features of the discussions are summerized below:

4.16.1 Presently, there are about 60 farmers who grow 1 - 2 acres of peanuts year round.

In terms of production acreage the range is 150 - 250 acres per year.

4.16.2 The local variety AK62 is used by **mostly all** farmers producing 800 - 1,000 lbs. of unshelled peanuts per acre.

4.16.3 Farm gate price as of October 31, 1979 ranged from $3.50 - $4.50 per lb.

4.16.4 Seed yields have been declining because farmers re-use **seeds** from previous crop.

4.16.5 The Agricultural Bank provides loans of up to $600/acre to peanut growers whose lands have already been cleared. However, the Bank has experienced a low recovery rate on its loans, which are made at 11 - 12% interest rate p.a.

4.16.6 Progressive farmers in the area have obtained up to 1,800 lb/acre with other germplasm material.

4.16.7 Cercospora Leaf Spot of peanut is the most serious disease in the area.

4.16.8 Constraints to increased production are:

(a) Unavailability of small harvester
(b) Difficulties in transporting farm imputs to production site
(c) Unavailability of hired labour.

4.17 Met with Messrs. Irwin Telfer, Deputy Chief Technical Officer, and John Browman, Acting Chief Technical Officer MINAG.

4.17.1 These gentlemen believe that the Paruima Project is a viable one and wish to see it implemented. Perhaps the IICA/Guyana Office could render assistance in this regard.

4.17.2 The author was informed that as part of the on-going seed programme with the USAID, peanut seed production is planned for the Wauna area.

4.17.3 Not unlike the recommendations of several other technicians both Browman and Telfer see Wauna as the potentially most successful area for an expanded peanut programme.

4.17.4 Meeting with functionaires of Guysuco: Present were:

Mr. Vibart Yong-Kong - Agricultural Director
Dr. Egbert Tai - Advisor
Dr. Gordon Mueller - Head, Other Crops Division
Mr. Charles Lawrence - Other crops Division.

4.17.5 The author was briefed on Guysuco's role towards Agricultural diversification. Cowpea (blackeye peas Var. Cal. 5) and corn were planted extensively on the sugar estates. During the three year period (1979 - 81) it is planned to cultivate 2,400 acres to cowpea.

4.17.6 Guysuco's plan vis a vis peanut is to have 40 acres of oil palm at Wauna intercropped with peanut. In terms of effective acreage, it would mean about 15 acres of pure stand. Guysuco will also be looking into possibilities of establishing a peanut crop in oil palm cultivations that are no more than 2 - 3 years old.

4.17.7 Guysuco's constraints to an expansion of peanut production are summarized thus:

- Inadequate resources for land preparation
- Unavailability of high quality seed material of the recommended cultivar
- Acute shortage of technical expertise.

4.18 Visit with Mr. Pooran, General Manager, Guyana Stockfeeds Limited. Discussions centered around the volome of imports of raw materials as ingrediants in the stock feed industry. The following information was supplied by Mr. Pooran:

4.18.1 The company has never utilized peanut meal in its various formulations for the reason that soyabean meal is readily imported from the U. S. A.

4.18.2 In 1974, between 500 - 600 tons per month of soyabean meal at 12% moisture and averaging 49% protein were imported from the U. S. A.

4.18.3 Presently, 800 tons of meal are imported per month at a cost of US $3 million.

4.18.4 Due to the low level of domestic production of corn, the company imports 6,000 tons of No. 2 yellow corn every three months at a cost of US $1.2 million.

4.18.5 Mr. Pooran made it clear that as an animal nutritionist he would have no problems incorporating peanut meal in his mixes for poultry and pigs, should this product become available locally.

4.19 Visit with Mr. Raymond Harrison, Food Technologist and Manager, Squirrel Manufacturing Industries. The Company pioneered the manufacturing of peanut butter in Guyana. Unfortunately, due to unavailability of raw peanuts, peanut butter has been off the production line for the past two years. The highlights of the discussion with Mr. Harrison are summarized thus:

4.19.1 It is imperative that raw unshelled peanuts be of low moisture content and free of mould growth, when delivered to the processors.

4.19.2 Squirrel prefers to purchase shelled red skinned peanuts for processing of peanut butter.

4.19.3 Experience with locally produced peanuts has shown that there is an unusually large number of 'pops' consequently shelling percentage is often times lower than 50%, thereby increasing the raw material cost.

4.19.4 Squirrel's present demand for shelled nuts if available at economically acceptable prices ($1.50 - $2.00 per lb shelled nuts) is 10 tons per year. The author has estimated that this will require production acreage of 30 - 35 acres.

4.20 Visit with Dr. Leslie Chin, Manager Guyana Pharmaceutical Corporation (G.P.S.). This enterprize has been expanding rapidly in the area of food processing.

Highlights of the discussions are as follows:

4.20.1 G.P.C. having acquired a wide range of food processing equipment from another state corporation has the capability of large scale production of peanut butter.

4.20.2 G.P.C. has just sought and obtained an import permit to purchase from the U. S. A. 63 tons of shelled peanuts at $1.76/lb for processing into peanut butter.

4.20.3 G.P.C. estimates that it will require 250 tons of shelled peanuts per year to satisfy its orders for peanut butter.

4.20.4 From 4.20.3 above at Guyana's present productivity level an additional 1,000 acres will have to be cultivated to satisfy the demand of raw peanuts for peanut butter by G.P.C.

ATTACHMENT - B

PEANUT COST OF PRODUCTION/ACRE

Duration of crop three months — Unshelled yield 1000 lb/acre

MAIN OPERATION	DETAILS		UNIT	FREQUENCY	RATE	COST
1. Land preparation	a)	Clearing & burning	Times	1	-	25.00
	b)	Ploughing (machine)	"	4	25	100.00
	c)	Harrowing	"	-	-	-
	d)	Establishing drains	"	2	20	40.00
2. Planting	a)	Digging holes and planting	Days	6	8.40	50.40
	b)	Materials & Nursery	lbs	60	2.00	120.00
3. Fertilizer Application	a)	TSP	lbs	100	68	68.00
	b)	Mixed	lbs	100	60	60.00
	c)	MP	lbs	50	38	19.00
	d)	Urea	-	-	-	-
	e)	Amm. Sulphate $(NH_4)_2SO4$	-	-	-	-
	f)	Pen Manure	-	-	-	-
	g)	Labour for application	Days	1	8.40	8.40
4. Plant Protection	a)	Weeding (two times)	Days	6	8.40	50.40
	b)	Chemicals	-	-	-	-
		1. Malathion				
		2. Dipterex				
		3. Other - Planavin	lbs	2	6.50	13.00
		4. Other - Aldrin	lbs	3	4.40	13.50
		5. Other - Dithane M45	-	10	4.50	48.00
	c)	Labour for application	Days	1	-	8.40
5. Irrigation and Watering	a)	Irrigation	-	-	-	-
	b)	Watering	-	-	-	-

6.	Harvesting	a)	Picking, cleaning and grading	Days	6	8.40	50.40
		b)	Packing container on farm	Bags	10	.50	5.00
		c)	Transportation	-	-	-	-
7.	Rent	a)	Rent ½ year				12.50
8.	Miscellaneous	a)	Miscellaneous				25.00
9.	Interest on Capital	a)	Interest 10%				71.70
	Total Cost of Production						78.87

Cost of production / lb (at 1,000 lb/acre)

Source: Cost of production studies of some Major Agricultural Products
Planning Division
Ministry of Agriculture,
December 1977

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ANNEX #3

GUIDELINES FOR MANAGEMENT AND TECHNOLOGY IN PEANUT PRODUCTION IN JAMAICA

Horace Payne - Agronomist
CARDI - Mona

December, 1979.

OBJECTIVES: To optimise economic returns by efficient utilization of local resources.

SELF CONTAINED PRINCIPLE FOR EFFICIENCY: All essential equipment and chemicals must be stored on the farm and readily available for timely operations.

VARIETY: Use Valencia (Jamaica local). It is a high yielding bunch type, vigorous and fast maturing with considerable resistance/tolerance to the local disease complex - Cercospora and Rust.

SEED MATERIAL SELECTION: The best healthy seed only, follow the below procedure.

1. Reap sections of best crop performance - prior and separately from general area of commercial production.
2. Do not wind row. Hand pick the largest full nuts. Dispose by sale of all small nuts with remaining crop.
3. Sun dry choice nuts separately for 4 days, reserving 200 lbs for each acre proposed for establishment in the next season.
4. Place nuts in onion bags and store in a well ventilated dry and secured shelter. The seed room should be kept clean with its inside borders treated with an insecticide. Set rat bait.
5. Shelling should be carried out just prior to planting.

6. Select only medium and large healthy looking kernels. All small discoloured or mouldy and shrivelled kernels are to be rejected.

7. Dust selected kernels with Orthocide (50% Captan) @ 4 ozs per 100 lbs of seed.

8. Plant immediately avoiding undue exposure in the process.

SITE SELECTION: Areas with good drainage only.

1. Light colored soils of good structure and light to medium texture such as Sandy Loams or Loams are to be preferred. Avoid heavy black soils that stick or discolour the nuts.

2. The slope of areas should be flat or gently sloping less than 5°.

3. Request soil test early for fertility assessment and fertilizer recommendations.

LAND PREPARATION: Start preparations early, that is, long before scheduled periods of establishment. A fine tilth and a smooth surface are required.

1. Farm and field sanitation: Eliminate all bush and weeds in surroundings of proposed area of peanut establishment.

2. Clean up and destroy all coarse plant residues in field.

3. Plough: Vary depth of tillage with depth of top soil, obtain a cultivated depth of 8 inches where possible burying plant remains. Don't incorporate sub-soil. Allow soil to weather for at least two weeks.

4. Harrow: To break up clods and fill voids. If soil is dry, irrigate or await a shower. Await 3 days for slight drying out.

5. Rotovate and smoothen slightly moist soil. If fertilizing is to be done at this stage broadcast fertilizer before rotovating, but placement of fertilizer at planting is to be preferred.

6. Land Form: For flat planting under rain-fed or over-head irrigated conditions locate ditches to take advantage of natural drainage. Under furrow irrigated conditions, the use of a 3 ft. bed shaper sets the stage for efficient irrigation and improved drainage.

CROP ESTABLISHMENT:

1. Time of planting must be such that maturity and harvest coincide with periods of expected dry conditions or at least sufficient rain free days as not to disrupt harvesting. On the Southern Plains, fall planting should occur in September/October to get the benefit of showers during this period and yet experience favourable conditions for harvest in January/February. Spring planting should be carried out in April, but will require supplemental irrigation. Suitable conditions for reaping will normally occur in July/August.

2. Planting must be carried out in moist soil.

3. Straight rows are essential - Guide operation by a chord line.

4. Space - seeds at 4 inches apart in rows at 18 inch intervals.

5. Vary depth of seeding with soil texture 1 inch deep on medium textured soil and 2 inches deep on light soils.

6. Immediately after planting, irrigate. Phase operations so that irrigation keeps in harmony with planting.

FERTILIZING: Peanuts benefit from residual fertilizer but none-the-less respond profitably to direct fertilizing.

1. Fertilizer placement at time of planting have given the best results. Application rates should be guided by soil test. A general purpose recommendation follows:

   A. for alluvial soils use 3 hundred weight per acre of 7-14-14.

   B. for bauxitic soils use 3 hundred weight per acre of 12-24-12. Place these complete grades in the bottoms of planting rows 1-2 inches below the depth of seeding.

Alternatively: the fertilizer can be applied in a band as a side dressing at about 2 weeks after crop emergence on both sides of the plant row and 1 inch away from the plant.

INTEGRATE PLANT PROTECTION: Strategies of prevention are more economical than those for cure. Maintain clean conditions.

WEED CONTROL:

1. Pre-emergence herbicides mixtures of Gesagard 50% and Dymid at 2 lbs each of the products in 40 gallons of water per acre have given good control for over 6 weeks when applied to moist soil and is best carried out immediately after the first irrigation before the seedlings emerge.

2. Inter-row cultivation involving the slight moulding action of cultivator sweeps should be carried out just prior to closing in of the rows.

3. Intra-row hand eradication should be carried out as required to maintain weed free conditions.

INSECT AND DISEASE CONTROL:

Commence spray programme early. Cocktail mixtures of an insecticide/fungicide/sticker have allowed reduction in the frequency of operations to two occasions corresponding to critical periods of the crop.

A. about 2 weeks after emergence

B. about 1 month later just before closing in of rows after inter-row cultivation.

No advantage has been derived by spraying within one month of harvest. The use of Sevin @ 2 lbs p.a. alternating with Malathion @ 2 pints in combination with Dithane M45 @ 2 lbs per acre have proven most satisfactory in controlling common pests. Set rat bait.

IRRIGATION SCHEDULES:

Although peanuts with its vigorous tap root system is capable of withstanding considerable moisture stress it responds well to frequent irrigation averaging over 800 lbs more per acre as a result. Commencing immediately after planting, irrigate every 7 days in the absence of rainfall for the first month, with overhead, light application of 1 inch is adequate. During 2nd and 3rd months of growth, the intervals between irrigations can be increased gradually to 10 days and then to 14 days. Increase overhead applications from 1 to 2 inches. Suspend irrigation after 3 months.

LIFTING TRIALS:

After 90 days, uproot random plants every week to determine period of optimum harvesting.

GREEN HARVESTING:

Do not wind-row. Use a peanut digger and thresher. Hand picking is appropriate only for small areas. Gleaning for recovery of nuts left in the soil after up-rooting is usually uneconomic. Peanut stover is an excellent livestock feed.

POST HARVEST CARE:

1. Sun dry for 1 day. 2. Clean and sort remaining dirty and cracked nuts. 3. Store as previously specified for seed material. Quick disposal is recommended.

ANNEX #4

SOME SUGGESTIONS FOR A PEANUT DEVELOPMENT PROGRAMME IN JAMAICA

Edward Martin & Horace Payne

1. INTRODUCTION

Sufficient has been learnt in recent years in Jamaica (both at the U.W.I. and the Ministry of Agriculture) to proceed with a programme of commercial peanut production. Admittedly much remains to be learnt about many aspects of peanut production in Jamaica and there will be always a need for further research being essential for progress and improved efficiency. However, we cannot defer development until such time as we possess all the answers to all the problems.

2. Jamaica Needs for Peanuts

At present, small seed **(Valencia)** production is concentrated in St. Elizabeth and is mainly in the hands of small farmers. Supplies are inadequate for the processors and imports indicate that approximately 1 million lbs of small nuts and ½ million lbs of jumbo nuts are required annually. To save foreign exchange, the priority question is how best to meet these short falls in production.

A Strategy for Increased Production

(a) Demonstrational Plots on Farmers holdings.

Estimates of acreage devoted to peanuts and their level of yield are highly variable. Recent statistics indicate that total acreage of Spring and Fall planting range between 2,500 - 3,000 acres with yield levels of 600 to 1,000 lbs unshelled nuts per acre. However, experimental and demonstrational plots on small farmers holdings have established that adoption of proper husbandry can lead to an increase of twice the yield level presently achieved. It therefore appears that Jamaica's need for small seed peanuts can best be achieved by an educational drive for improvement of farmers' skills.

(b) Extended areas of production.

Expansion of areas in peanut production should not necessarily cause competition in land use. The value of peanuts as a legume in planned rotations should be exploited. For example, peanuts could be produced in rotation with sugar cane. Between 10 - 15% of our rich alluvial soils devoted to sugar cane is replanted every year. Peanuts as a cash crop will offset land preparation cost. Furthermore, there is great potential to use peanuts in rotation with other crops on selected areas of Project Food Farms and Project Land Lease. Areas utilizing peanuts in rotation should be in a zoned basis, so as to develop areas of concentrated peanut production.

(c) Peanut Co-operatives and Crop Zoning

To avoid mixing of small and large seeded types of peanuts, production should be encouraged in widely separated areas. Namely, small seed production in St. Elizabeth where it is already established and large seed production in St. Thomas where a start has recently been made at Yallahs. It is essential that peanut growers should be properly organized, preferably in the form of a co-operative. Under such an organization, contracted supplies should be allotted to each grower or group of growers and the co-operatives held responsible for collection, shelling and storage. In this manner, some integration of the industry will be achieved. The Processors, already located in Kingston with their huge capital investment and expertise will, of necessity, have to remain where they are, to cater to the requirements of several centres of production.

PRIORITIES FOR RESEARCH

The need for research falls logically under two heads

(1) Major field problems

(2) Post harvest problems

Only main areas for investigation are indicated as details will be supplied on individual project sheets. Suitable areas for experimentation are available at Lawrence field and Albion.

1. Major Field Problems

Agronomic

(a) Variety testing and bulking up of planting material.

(b) Spacing trials - Particularly to determine intervals for mechanised planting and harvesting.

(c) Comparison of irrigation methods - Frequency of application, effect on disease and harvest.

(d) Rotations - The value of multiple cropping e.g. peanuts in corn. The residual benefit of fertilizer to maximise productivity.

(e) Land preparation and land forming.

The depth of ploughing, the merits of moulding and their effects on pegging.

Crop Protection

(a) Diseases and their control - materials and method of control.

(b) Insect and Pest Control - Distribution of types.

(c) Weed Control - both chemical and mechanical and study of weeds in major peanut areas.

Costing Trials

These are best carried out on private farms as agricultural stations are not suitable.

2. Post Harvest Problems

It is suggested that experience drawn from producer countries should be sought as to the method to be used in drying and storage. These methods almost surely will call for specially constructed sheds or buildings and system of artificial drying. Assistance from the Storage and Infestation Division will be most welcomed in this regard as no attempt should be made to construct buildings or acquire heating units based on inadequate technical advice.

Edward Martin & Horace Payne

AGRONOMISTS

15th October, 1975.

PEANUTS - POSITION PAPER

by: Leslie Guthrie

The present situation is one that has been of much concern over the past ten (10) years both in the agricultural and agro-industrial sectors. It is a fact that peanut has great potentials for local agro-industrial development which would be a great boost to the economy and to human as well as livestock nutrition. Peanut is easy to plant, easy to grow, easy to reap and less risky than most grain legumes.

Since 1973 there have been fluctuations in the annual production of peanuts although there have been a steady increase in the National requirements which is now 3,500 - 4,000 short tons. Owing to foreign exchange problems and import restrictions, it has become necessary to focus greater attention on expanding local production and increasing yields to assist efforts in developing the use of peanuts for agro-industry.

Of all the grain legumes, peanut has shown the highest promise. The acreage reaped was 4,670 with a yield of about 2,435 short tons, representing about 70% the National requirement.

(i) Constraints

Polarization or Concentration of peanut production. Over the years since the introduction of peanuts in Jamaica in the Newton/Barton area of St. Elizabeth this parish has been responsible for as high as over 90% of the annual peanut production, which is due more to tradition rather than cultural practices and soil type in some areas.

Parishes other than St. Elizabeth which have a potential for producing thousands of acres of peanuts are lower St. Thomas, St. Catherine, Clarendon, Manchester, St. Ann and small areas in Trelawny, Westmoreland and Portland.

(ii) Most of the potential peanut growers in St. Elizabeth have limited acreage for expansion. This leads to other problems such as -

(a) Little or no crop rotation

(b) Continuous and successive planting on the same plot resulting in the degeneration of planting material and poor yields.

(iii) Land Tenure

Most of the peanuts are planted on rented lands, hence little attempt is made at land reclamation.

(iv) Shortage of planting material for other areas which have a potential for production. This was pointed out in 1973 but up to now no incentive has been given to peanuts comparable to that given to Red Peas, Cow Peas, Congo Peas or Broad Beans. If this was done as suggested we would have established thousands of acres in the other parishes which have a potential for peanut production.

(v) The chief importers were not altogether co-operative in the development of local raw materials for agro-industry, thus advancing successive arguments which did not stand up to interrogation but lengthened their time for continued importation.

(vi) Weather conditions

Although peanut is a hardy crop it can be severely affected by excessive rain and severe drought.

Parishes	Crop Lien	Land Lease	Others	Total	Estimated Yield
					Short Tons
St. Elizabeth	284 acres	1,240 acres	1,650 acres	3,184 acres	1,621½
St. Ann		20 "	5 "	25 "	12½
Westmoreland	61 "	10 "	37 "	108 "	54
Portland			3 "	3 "	1½
St. Catherine	32 "		223 "	255 "	127½
Lower St. Thomas		20 "	293 "	313 "	156½
Clarendon	147 "	87 "	183 "	417 "	208½
Trelawny			46 "	46 "	23
Manchester	167 "	256 "	840 "	1,263 "	631½
TOTAL	701 acres	1,633 acres	3,280 acres	5,614 acres	2,939½ S.T.
PERCENTAGE	12.3%	29.7%	59%	100%	

Percentage Production Distribution:

St. Elizabeth - 57%

Other Parishes - 43%

N.B. Yields are estimated hence actual production may be considerably lower owing to some of the constraints previously mentioned.

Areas of Production and Areas of Potential and Crop Rotation practices in these areas.

Areas of Potential	Areas of Production	Crop Rotation Practices
St. Elizabeth: All 78 soil types Clay loam Newell - Clay Loam along with their transitions, parts of Northern, Central and Southern areas approximately 3,600 acres on Land Lease properties and 7,000 acres on private lands annually inclusive of mined out lands.	Holland Mtn (500 acres) Emmaus (500 acres) Holland Brook, Biscayne, Newton/Barton Area, Barton Isle, Hounslow, Lancewood, Northhamton, Bailey Ground, Cornwall Mtn., Giddy Hall, Goshen Mtn. Charles, Olive Park, Stephen Run, Warminister, Carrisbrook, Bull Savannah, Elderslie, Ballards Valley, Maggotty, Total 3,200	Mixed with corn in some areas. Rotate with corn, yams, red peas and sweet potatoes and cassava. No rotation practice found in many areas..
Clarendon: Rio Minho Valley and all 78 soil types. Approximately 1,500 acres, annually includes mined out lands.	Pennants, Morgans Pass, Bakers Pen, New Ground, Sandy Bay, Rose Hall, May Pen area, Parnasus, Suttons Bogue, Needham. Present acreage 417 acres	Pre-crop for citrus or sugar cane even coconuts. Rotate with corn, yams, sweet potatoes.

Production and Potential areas continued

Areas of Potential	Areas of Production	Crop Rotation Practices
Manchester: All #70 soil types and #73. South Manchester area with adequate water approximately 3,000 acres annually, including mined out lands.	Grove Town, St. Jago Java, Hermitage, Chudleigh, Mile Gully, Medina Huntley, Petersfield, Lyndhurst, Somerset, Sherwood Forest, Berwick, Kendal Chippenham, Mtn. Pleasant, Top Shan, Beckford, Greenvale, Ayr Pen, Wigton and Devon area. Present acreage 1,263 acres	Pre-cropped and inter-plant with citrus. Rotate with corn, yams, Irish potatoes.
Westmoreland: Limited expansion approximately 500 acres.	Belmont Area This needs further investigation. Present production 100 acres.	Could be inter-plant. Sugar cane at establishment stage.
St. Catherine: Rio Cobre Valley, Bush Park and Old Harbour area. Approximately 1,500 acres annually.	Charlemont, Linstead Area, Point Hill Area, Buch Park, Nightengale Grove area, Caymanas and Inswood, Old Harbour Area.	Pre-crop and inter-plant. Sugar cane and citrus. Rotate with vegetables and corn.

Farmers should be supplied fresh planting materials at each planting instead of having to use saved back seeds.

Jamaica could look forward to export peanuts and peanut products rather than importing. Bauxite Companies - Alcan, Reynolds and Kaiser could be encouraged to plant peanuts in mined-out areas. Trials are being done in the Alexandria area by Kaizer.

RECOMMENDATIONS:

(i) Improvement of planting material, crop care, cultural and rotation practices.

(ii) Expand industry in potential areas.

Peanut Hay:

When peanuts are harvested and cured by hand, most of the leaves are retained and the hay is valuable for livestock feed. With windrowing the plants and mechanical harvesting of the nuts the vines are not cured for hay but are scattered over the land for soil improvement.

Fraps (1917) described three varieties of peanut hay.

(1) Peanut Hay (Mowed) - sometimes the tops of the plants are cut with a mower and dried into hay. Both the leaves and stems are highly nutritious and are relished by farm animals.

(2) Peanut Hay with Nuts - The vines, with the nuts on them, are removed from the soil and cured into hay The product contains nuts, roots, stems and leaves. This is rich hay and was very common prior to about 1920, when peanuts were grown almost entirely for livestock.

The practice was followed by that of "hogging off" the nuts and allowing cattle to eat the hay in the field; and this in turn was followed by the practice of harvesting the nuts for edible purposes

Peanut Meal:

This is the ground cake after pressing out the oil. It contains some hulls and skins, as well as dirt and inedible peanuts. It is used in feed for most domestic animals, in many parts of the world.

The composition of peanut meal varies widely, depending upon the variety of peanuts, portion of hulls and trash included, and method of removing the oil. For this reason it is suggested that it be bought on analyses that include the percentage of protein, oil, and crude fibre.

Fraps (1917) found the ground pressed cake of peanut kernels to contain an average of 44.9% protein, 23% of N-free extract, 8.8% oil, 12% crude fibre, 6.2% water, and 4.8% ash.

The following definitions were adopted by the Interstate Cottonseed Crushers Association for peanut cake:

Choice peanut cake is a product of sound peanuts, sweet in odour, not burned in cooking and shall contain not less than 44% protein or 50% of combined protein and fat.

Prime peanut cake is a product of the peanut, sweet in odour, and shall contain not less than 34% protein or 40% of combined and fat.

Choice peanut meal is a ground product of choice peanut cake and by analysis must contain not less than 44% protein or 50% of combined protein and fat.

Prime peanut meal is a ground product of prime peanut cake and by analysis must contain at least 34% protein or 40% of combined protein and fat.

Feeding Peanut Meal - Burk (1918) reported that peanut meal is too rich to feed pigs alone. Within two days after beginning feeding the pigs lose appetite and the hair becomes rough. This condition may be corrected within two days after two pounds of meal is fed per pound of peanut meal. Corn, sweet potatoes, tankage, and other grains are excellent supplements to peanut meal.

Peanut Skins:

Peanut skins are a by-product of dry blanching operations and average 2 to 4% by weight. They are light and fluffy and difficult to handle. The oil content may run as low as 5% or as high as 28%, depending upon the procedure of handling.

Like peanut shells, peanut skins are a financial liability to the sheller. They may be used in cattle feed but become stale and rancid within three weeks. A small amount of oil may be recovered when peanut skins are pressed with whole peanuts. They may be mixed with floor sweeping compounds, or used as bedding in poultry houses. Peanut skins may be a commercial source of tannin and thiamin.

Peanut Hearts:

Peanut hearts are also a by-product of dry blanching operation and run about 4% by weight. Except for a bitter flavour, they are identical in composition with blanched nuts.

Peanut hearts have a ready sale for oil recovery use in bird feed, or poultry feed.

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May 1980.