ZONA DE LAS ANTILLAS
Representacion en Jamaica
P.O. Box 349
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PRODUCTION & MARKETING OF RED PEAS

Guisante

IN THE HILLY AREAS OF JAMAICA

PRODUCTION AND MARKETING

OF

RED PEAS IN THE HILLY AREAS

OF JAMAICA

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AGRICULTURE IN JAMAICA

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No. III- 7 Canute McLean, "Production and Marketing of Peanuts", November 1979

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No. IV- 1 Joseph Johnson, "Production and Marketing of Red Peas in the Hilly Areas of Jamaica", January 1980

METHODOLOGY

The study is being undertaken to determine various aspects of production and marketing of red peas in the hilly areas of Jamaica, and the effects of price insecurity on small farmers.

This study has obtained existing data on production, imports, markets and prices from various sources such as the Planning and Policy Review Division, the Data Bank and Evaluation Division of the Ministry of Agriculture, Trade Statistics and the Agricultural Marketing Corporation. Limited Library research has also been done on the crop.

Information has been collected from Technicians and Farmers in the major producing areas concerning various aspects of production and marketing and on factors affecting decision making. Information has also been obtained from higglers, supermarkets and consumers.

All the relevant data has been analysed and inferences have been drawn as to the future of the crop.

FOREWORD

Grain legumes constitute an important source of proteins in the Jamaican diet. Red peas are the most popular of these legumes. Notwithstanding this, the demand for red peas has been traditionally greater than the supply from local sources. There developed a great reliance on imports not only because of problems associated with production but also because of the lower prices of imported peas. Currently, imports are being curtailed because of a shortage of foreign exchange which has necessitated a restrictive import policy. This, therefore, provides a greater awareness of the necessity for encouraging local farmers to increase production. The local production of red peas has not reached its potential, and production is associated with considerable risk. Although special requirements are needed for successful production, it is evident that local supply can be increased significantly through the use of better seed material, improved crop management and supporting technology derived from adaptive research.

IICA, working in association with the local Ministry of Agriculture (MINAG), has contributed to a research approach designed to increase the production of red peas particularly as an intercrop in improved cropping systems being investigated, with some success, on Jamaican hillside farm lands, such as Allsides.

Additionally, IICA has collaborated with MINAG in producing a number of technical papers on legumes in general and red peas in particular. This paper is a part of the series "Agriculture in Jamaica" and was prepared in collaboration with the Ministry of Agriculture.

Due recognition is given to Mr. J.S. Johnson of the Planning and Policy Review Division of the Ministry of Agriculture, for his collaboration and for the preparation of this paper.

Dr. Percy Aitken-Soux
Director, IICA/Jamaica

January, 1980

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CHAPTER 1

INTRODUCTION

Red peas (Phaseolus vulgaris L.) otherwise popularly known as Red Kidney Beans, a self pollinated annual, probably of sub-tropical origin is today cultivated under a wide variety of climatic conditions. The plant prefers well drained deep loam or light silt soils with adequate organic matter, and pH of 6.5 to near neutrality is best.

This crop is the most important grain legume in the Jamaican diet. It is consumed primarily as rice and peas, but red peas soup and stew peas are also quite popular dishes. In Jamaica, like elsewhere, it is not only consumed as a grain, but also as string beans, when the young pods are eaten. The paper will deal with the crop as a grain, however.

Not only is the crop important because of the high demand for it locally from all income groups of the population, but it is an important source of protein for many persons who can purchase only small amounts of animal protein. Again, because so much rice is consumed in Jamaica, the combination of this crop - red peas with rice is very good since such a combination improves the nutrient value of the diet.

During the period 1971 to 1977 Jamaica imported 10,673 short tons of red peas valued at $4,716,142. Import was highest in 1975 when 2,190 short tons were imported. During the period 1970 to 1978, 26,322 short tons were produced locally. The year of highest production was 1978 when 5,694 short tons were produced, with a farm gate value of $17.3 million.

As will be shown later, the crop is primarily a small farmers' crop in Jamaica. It is grown mostly in the cool hilly regions of the country. It is therefore very relevant to look at the production and marketing of this crop in the hilly areas of the country. The crop is produced both for the market economy and as a subsistence crop.

CHAPTER 11

PRODUCTION AND GEOGRAPHICAL DISTRIBUTION

2.1 SOIL AND CLIMATIC FACTORS BEST SUITED FOR THE CROP

The crop requires good drainage. The soil should preferably be a deep loam or light silt with good organic matter being residue from previous crops or from manuring. Soil acidity should be about pH 6.5 to near neutral.

In Jamaica the crop thrives best on the light rich soils with a relatively cool climate, hence the heavy concentration in the hilly regions. The crop requires about 6-8 weeks of rainy weather, If such rainfall is not available then irrigation water should be provided. This should be followed by a drying off period for the pods do not ripen with plenty of rainfall since this will lead to beans germinating in the pods.

2.2 PRINCIPAL AREAS WHERE THE CROP IS GROWN IN JAMAICA

The crop is grown mostly in the parishes of Manchester, St. Ann, St. Elizabeth, Clarendon and Portland. If consideration is given on a non-parish basis then the Christiana Area Land Cuthority (CALA) is a major producing area. In 1977 for example the five parishes mentioned above produced 76 percent of the red peas grown in the entire island. In 1975 and 1976 when production information was collected on a Land Authority basis, CALA was the highest producing Land Authority each year, with production representing 30 and 18 percent of total production in 1975 and 1976 respectively.

On a more local level, areas of major production are:

Devon, Christiana, Mandeville, New Port and Mile Gully in Manchester; Elderslie, Southfield, Bogue, White Hall and Siloah in St. Elizabeth; Guys Hill, Lluidas Vale, Mount James, Old Harbour and Glengoffe in

St. Catherine; James Hill, Rhymesbury, Menie, Spauldings, Whitney and Kellits in Clarendon; Alexandria, Industry, Gibraltar, Bensington and Wild Cane in St. Ann; Fair Prospect, Orange Vale, Rose Garden and Hart Hill in Portland; Bog and New Road in Westmoreland; Wait-A-Bit in Trelawny; Anchovy and Kensington in St. James; and Burnt Shop and Swain Spring in St. Andrew.

The list of places mentioned is by no means exhaustive, but is intended to give the areas where traditionally fairly large quantities of the red peas produced in Jamaica are grown.

2.3 SOILS AND CLIMATIC FACTORS IN THE MAJOR PRODUCING AREAS

From the wide range of areas that produce red peas in Jamaica, it is not surprising that the crop is grown on a wide range of soils and in areas having a wide range of micro-climatic conditions.

THE PARISH OF MANCHESTER

Temperature records at Grove Place, near the centre of the Parish, show a range of 50°F to 90°F for minimum and maximum temperatures respectively. Annual rainfall of over 60 inches occurs throughout the Parish with the exception of the Southern coastal strip. Mandeville in the centre of the Parish has over 80 inches per annum on average. Most of the areas in Manchester where the crop is grown experience a marked dry season from November to March. The rainy season begins in April with May being the month of greatest rainfall. There is another relatively dry spell from June to August followed by another peak rainy season during September to early November, with October being the heaviest rainfall month during the period.

The two dominant soil types found in Manchester and on which the crop is grown are the St. Ann Clay Loam (Soil Type No. 78) and the Chudleigh Clay Loam (Soil Type No. 73). Other soils of less importance for this crop in Manchester are the Wirefence Clay Loam (Soil Type No. 32) and the Wait-A-Bit Clay (Soil Type No. 95).

The St. Ann Clay Loam and the Chudleigh Clay Loam (the red and brown bauxite soils respectively) in association with the Bonny Gate Stony

Loam cover almost the whole of Manchester. The Chudleigh Clay Loam only occurs in the Northern half of hte Parish, however, where rainfall is generally higher. It consists of a friable brown clay loam passing downwards into a yellowish red or brown clay. It has a slightly higher fertility status and better water retaining capacity than the St. Ann Clay Loam. Soil reaction is near neutral. Soil fertility is fairly low, and it is necessary to preserve the top soil. This soil usually faces a moderate to high erosion hazard.

The St. Ann Clay Loam is normally a deep, very well drained red acid soil of low fertility and poor water retaining ability. The soil usually has a moderate to high erosion hazard.

THE PARISH OF TRELAWNY

Temperatures range from 65°F to 82°F in the hottest months and 58°F to 74°F in the coolest months. The main red peas growing areas have a short dry season of 2-3 months with less than 4.0 inches rainfall per month. Annual rainfall in these hilly areas ranges from about 75-100 inches.

The major soils in the red peas producing areas of Trelawny are the Wirefence Clay Loam, the Wait-A-Bit Clay, the Carron Hall Clay (Soil Type No. 94) the Chudleigh Clay Loam and the St. Ann Clay Loam.

The Wirefence Clay Loam is a poorly structured soil, acidic and easily erodible, with a red mottled subsoil. Drainage through the soil is moderate. Natural fertility is low. Dominant slopes on which this soil is found range from 10°-30°.

The Carron Hall Clay is dark brown, almost neutral in reaction and of high fertility. Although not easily eroded, it frequently occurs on steep slopes. It has a high water retention capacity. The Wait-A-Bit Clay occurs on slopes of up to 30°. Drainage through the soil is rapid, but the soil usually has a high erosion hazard. Soil reaction is highly acidic.

THE PARISH OF ST. ELIZABETH

Temperatures range from 70°F-90°F in the hottest months and 62°F-79°F in the coolest months. Annual rainfall ranges from 34 inches in the

Pedro Plains to as high as 97 inches in the Maggotty area.

The major soils on which red peas is grown in St. Elizabeth are Carron Hall Clay, the Chudleigh Clay Loam, the St. Ann Clay Loam, the Linstead Clay Loam (Soil Type No. 61), the Four Paths Loam, the Brysons Clay Loam, and the Newell Clay Loam (Soil Type No. 67).

The Linstead Clay Loam and Brysons Clay Clay Loam are acidic shotty soils, with very slow drainage in the subsoil.

THE PARISH OF CLARENDON

Temperatures range from 65°F to 80°F in the hottest months and 60°F to 74°F in the coolest months in the hills. Annual rainfall ranges from 60-80 inches in the hilly regions, though the plains get as low as 45 inches at New Yarmouth. In Whitney the hills average is 89 inches per annum.

The major soils found in the red peas growing areas are the Wirefence Clay Loam, the Wait-a-Bit Clay, the Carron Hall Clay, Deepdene Clay (Soil Type No. 98), Donnington Gravelly Loam (Soil Type No. 36), the Cave Valley Clay (Soil Type No. 116), the Cuffy Gully Sandy Loam (Soil Type No. 38) and the Wild Cane Sandy Loam (Soil Type No. 96).

The Wild Cane Sandy Loam is well drained to excessively drained, very erodible, usually found on slopes greater than 20°, acidic and of low fertility. The Cave Valley Clay is a slow draining soil with a good moisture supplying capacity and slightly acidic. The Diamonds Gravelly Loam has a fair moisture supplying capacity, of medium fertility, acidic and usually faces a high erosion hazard.

THE PARISH OF ST. CATHERINE

Temperatures range from 62°F to 91°F. Annual rainfall ranges from 35 inches on the plains to 95 inches in the hilly regions. There are rainless months with February and July the driest months with May and October the peak rainfall months.

Important soils in the red peas producing areas are the Diamonds Clay Loam (Soil Type No. 34), the St. Ann Clay Loam, Lluidas Gravelly Loam (Soil Type No. 106), and the Flint River Sandy Loam.

ıe Diamonds Clay Loam has an extremely rapid drainage thus giving the il a low to fair moisture supplying capacity. Natural fertility is low and soil reaction is slightly alkaline. The soil is highly erodible.

SUMMARY ON SOILS AND CLIMATE

Soils and climate have not been presented for all the parishesproducing red peas because the soils found in one parish invariably are found in other parishes varying mostly only in the degree of importance to the parish. From the discussion of the soils, it can be seen that red pea is grown on clays, clay loams and loams; on acidic to neutral soils; on soils ranging from those which have free drainage to those which have impeded drainage. Though there are variations in the amount of rainfall and its distribution in the major producing areas the variability seems to be less than with the soils. Temperatures in the hilly areas of most parishes are fairly close.

2.4 SCALE AND METHODS OF PRODUCTION

Red peas is planted throughout the island in small plots. Very seldom do farmers plant over 2 acres, and less than half an acre is the more popular size of red peas plots. This crop is planted in pure stand and also mixed with other crops. The crop is planted in mixed stand primarily with corn, yam, Irish potato and also with the plant crop of sugar cane by small farmers.

Where the land is fairly level and farmers are planting more than half an acre, the land is usually prepared mechanically with tractors. In many areas the slopes are either too steep, or even when fairly level may be inaccessable to tractors, as a result of which hand labour has to be used to clear the land and to fork it.

Planting is usually done manually whether the crop is planted in pure stand or mixed stand. Rows are usually 30 inches apart while seeds are planted 3 inches between holes in pure stand, though some farmers plant 2 seeds per hole 6-12 inches apart.

Under mixed cropping spacing etc. vary and other factors relating to establishment and cultivation according to the crop with which it is being planted. In the case of Irish potatoes, the Irish potato is

usually planted on small mounds with the peas planted between the mounds. When planted with yams, the yams are usually planted on individual mounds on which the peas are planted at the back of the mound. In the case of sugar cane the peas are usually planted between the sugar cane furrows.

With the exception of land preparation which is sometimes mechanised all the other field operations are usually performed manually.

2.5 COST OF PRODUCTION AND RETURNS PER ACRE

The cost of production and returns per acre for this crop vary considerably depending on the level of inputs, the level of management, the method of land preparation i.e. whether mechanical or manual and the general soil and climatic factors.

In terms of yields, the national average over the 3 year period - 1975 to 1977, was 575 lbs of dry peas per acre. During 1975 and 1976 the country continued to experience severe droughts which have adversely affected agriculture for a number of years. This accounted for the rather low yield of 575 lbs for the three year average. The national average of 1977 was 651 lbs per acre. The range per acre on a parish basis for 1977 was 477 lbs in St. James to 913 lbs for St. Elizabeth.

When land is prepared manually the cost of land preparation is of the order $220 to $250 per acre. Land preparation when done mechanically is much cheaper, however, and thus reduces production cost to the order of $100 to $120 per acre.

Many farmers apply no insecticide or fungicide to their red peas crop. This will tend to reduce the cost of production. But lower yields are usually obtained when these inputs are not applied.

COST OF PRODUCING AN ACRE OF RED PEAS

(A) TABLE 2.1

LABOUR OPERATIONS	RATE	COST $
Land Clearing	$40 per acre	40.00
Forking	20 per square	200.00
Planting Seeds - 6 man days	7 per day	42.00
Spraying - 5 man days	7 per day	35.00
Weeding -10 man days	7 per day	70.00
Reaping - 4 man days	7 per day	28.00
Shelling and Sifting - 6 man days	7 per day	42.00
Bagging and Transport	$0.55 per 100 lb.	4.62
Sub-Totals Labour		$461.62
(B) MATERIALS		
Seeds - 64 lbs.	$1.50 per lb.	96.00
Rogor - 4 pints	$6.00 per pint	24.00
Chlorodane - 2 pints	$4.00 per pint	8.00
Sub-Totals Materials		128.00
OTHER CHARGES		
Contingencies 10% A&B		59.00
Depreciation 5% Field Operations		23.00
Land Charge	$35 per year	18.00
Interest	6% per year	18.00
Sub-Total		118.00
Return for Risk Management	20% (A & B)	118.00
Total Cost of Production		826.62

Marketable Yield = 900 lbs.

Cost of Production per lb. = 826 ÷ 900 = 91.2¢, say 91¢.

2.6 ANNUAL PRODUCTION FROM 1970 to 1978

During the period 1970 to 1976 local production remained fairly static with the exception of 1971 and 1972 when significantly higher yields were obtained. In 1977 and 1978 there were marked increases over the former years however. In 1977 production was 3,706 tons. This production was a 61 percent increase over the 1976 production while in 1978 production was 5,694 tons, a 53.6% increase over 1977. Table 2.2 shows the 1970 to 1978 production, and imports.

RED PEAS PRODUCTION AND IMPORTS 1970-1978

TABLE 2.2 (S. Tons)

Year	Production	Imports	Total Supply
1970	2,150	N.A.	N.A.
1971	2,830	1,568	4,398
1972	2,980	1,510	4,490
1973	2,030	2,004	4,034
1974	2,370	1,685	4,055
1975	2,257	2,190	4,447
1976	2,305	1,483	3,788
1977	3,706	233	3,939
1978	5,694	57	5,751

Source: (a) Statistics: Ministry of Agriculture
(b) External Trade Statistics - Department of Statistics Jamaica.

2.7 MAJOR PROBLEMS AND CONSTRAINTS LIMITING LOCAL PRODUCTION

A number of factors have inhibited the expansion of red peas production over the years. Among these problems is the question of providing certified seeds that will perform well under Jamaican conditions. At times imported seeds have failed to produce well under Jamaican conditions.

Local selections tend to do well, but farmers usually have no degree of certainty that such seeds are disease free. The Ministry of Agriculture has been trying to assist in this situation by contracting seed from farmers who can meet certain conditions in the production of such seeds, and in turn store and sell these seeds to other farmers. This is still inadequate since this system does not produce certified seeds.

In most of Jamaica, more so in the hilly areas where the bulk of the red peas is grown, farmers have to depend solely on rainfall for production of a good crop of peas. Over the last 10 years the weather has been rather unpredictable, as a result farmers may either end up with a situation where the crop is planted and there is not enough rainfall or there may be too much rainfall, more so when the plants are flowering, causing loss flowers. Too much rain when the pods are near harvesting also results in germination of the beans in the pod. Excessive rains also destroy the leaves of the plants. All these factors help to reduce crop yields.

As was mentioned earlier, in many of the producing areas, the crop is grown on very acidic soils and the farmers do very little liming. Farmers have not been made sufficiently aware of the benefits to be gained from liming the soil when the pH is low. Additional work is needed in determining and demonstrating the costs and benefits of liming so as to provide a guide to farmers.

Enough research findings are not available to farmers on disease and pest control. This is not so much in the area of the technical aspects, but more so in the economics of applying insecticides and fungicides. Traditionally small farmers have had problems in getting adequate credit, but this situation has improved within recent years. However, some of the other farmers are reluctant to utilize credit when it is available. This reluctance to use credit is sometimes due to the fact that farmers are old and conservative. This reluctance is understandable since they may be required to provide collateral, and they would be unwilling to take such a risk.

The hilly terrain on which a high percentage of the red peas is grown, makes land preparation very difficult and expensive since it is mostly

done manually. In many instances cropping is being carried out without the benefit of appropriate soil conservation measures. Agricultural wage is also low, thus making it difficult to attract labour at times, especially where there is a shortage of labour in the farm family.

2.8 SUGGESTED STRATEGIES FOR OVER COMING SOME OF THE PROBLEMS INHIBITING PRODUCTION

In order to overcome the problem of non-availability of local certified seeds, it is vital that a certified seed farm be established. This may become a reality soon, since a project is being prepared and should soon be at the stage of implementation.

The Research and Extension Services need to get across more information to farmers on liming of soil where pH is low and it is feasible to lime, and on the economics of proper pest and disease control. More research should be done on the response of this crop to fertilizer also, and this information passed on to farmers.

CHAPTER III: MARKETING

3.1 THE LEVEL OF ANNUAL IMPORTS 1971 to 1978 AND ITS CONTRIBUTION TO TOTAL SUPPLY

Imports of red peas made a significant contribution to total supply during the years 1971 to 1978. In 1973 imports amounted to 49 percent of total supply. By 1977 imports, however, accounted for only 6 percent of total supply, and this fell to 1 percent by 1978. Table 3.1 shows the production, imports and total red peas supply for the years 1971 to 1978.

3.2 NUTRIENT VALUE OF RED PEAS AND ITS NUTRIENT CONTRIBUTION TO PER CAPITA FOOD CONSUMPTION IN JAMAICA

Information from the Food Consumption Tables for use in the English Speaking Caribbean show that the red pea is quite a nutritious legume. The edible portion of one pound weight of whole dry beans has the following composition.

TABLE 3.2 NUTRIENT CONTENT OF DRY RED PEAS (1 lb)

Water	Energy	Protein	Fat	Carbohydrate	Fiber	Calcium	Iron	Vit. A	Thiamin	Ribo-Fla.	Niacin	Vit. C
gM	K.cal	gm	gm	gm	gm	mg.	mg.	R.E.	mg	mg	mg	mg
12.0	1,529	99.0	7.3	275.8	19.5	390	34.5	5	2.45	0.86	9.5	14

SOURCE: Caribbean Food and Nutrition Institute "Food Composition Tables for use in the English Speaking Caribbean".

PRODUCTION, IMPORTS AND TOTAL RED PEAS SUPPLY 1971 - 1978

Value ($) At farm gate	IMPORTS Quantity (S. tons)	IMPORTS Percentage of supply	IMPORTS Value ($) C.I.F.	Total Supply (S. tons)
000	N/A	N/A	N/A	N/A
	1,568	35.65	419,848	4,398
	1,510	33.63	477,300	4,490
	2,004	49.68	801,204	4,034
	1,685	41.55	1,126,602	4,055
	2,190	49.25	973,300	4,447
	1,483	39.15	794.270	3,788
	233	5.92	123,618	3,939
	57	1.00	53,930	5,751

riculture, Department of Statistics

The contribution of red peas to per capita food consumption with regards to calories and protein is shown in Table 3.3 for the years 1971 to 1978.

THE CONTRIBUTION OF RED PEAS TO JAMAICA'S PER CAPITA ENERGY - PROTEIN CONSUMPTION FOR 1971 to 1978.

TABLE 3.3

Year	Estimated Population	Total Supply	Energy (kcal) Per Caput/Day	Energy as % of RDA 1/	Protein (gm) Per Caput/Day	Protein as a % of RDA
		(S.Tons)				
1971	1,911,400	4,398	19.27	0.9	1.25	3.0
1972	1,953,500	4,490	19.26	0.9	1.25	3.0
1973	1,991,000	4,034	16.97	0.8	1.10	2.7
1974	2,025,000	4,055	16.78	0.8	1.09	2.7
1975	2,060,300	4,447	18.08	0.8	1.17	2.9
1976	2,084,200	3,788	15.23	0.7	0.99	2.4
1977	2,109,400	3,939	15.64	0.7	1.01	2.5
1978	2,137,400	5,751	22.54	1.0	1.46	3.6

SOURCE: Computations, and Demographic Statistics, Department of Statistics. 1/ RDA = Recommended Dietary Allowance.

3.3 SYSTEMS UNDER WHICH THE CROP IS MARKETED

Red peas is marketed in Jamaica through a number of channels. The main outlets are:

(a) Parochial Markets
(b) The Agricultural Marketing Corporation
(c) Superkarkets
(d) Green Groceries
(e) Curbside Markets

(a) PAROCHIAL MARKETS

According to the Higgler Survey of 1977 there are 100 Parochial Markets distributed throughout the island. Nine of these markets are located in Kingston and St. Andrew with the rest in the rural parishes. Table 3.3 shows the distribution of these markets by the number of higglers selling in them.

DISTRIBUTION OF MARKETS BY SIZE GROUP OF HIGGLERS

TABLE 3.4

No. of Higglers	No. of Markets
Less than 20	39
20 to less than 60	18
60 to less than 100	15
100 to less than 140	10
140 to less than 180	4
180 to less than 500	7
500 and over	7
TOTAL	100

SOURCE: Smikle C., and Taylor H., First Draft Report Higgler Survey, 1977.

These parochial markets are primarily retail outlets for various crops including red peas. Some of them serve also as wholesale and transfer markets. Though estimates vary, it is generally accepted that sellers in these markets handle in the region of 80 percent of marketed portion of the domestic food crops, with red peas being no exception. The higgler surgey of 1977 showed that there were just over 13,000 higglers operating in these markets. The survey, however, showed that these markets were increasingly becoming inadequate as outlets for agricultural produce. They not only lacked physical space for display of goods but also lacked modern facilities and amenities. Over 50 percent of the total number of higglers operating in these markets reported lack of adequate space as one of their main marketing problems.

(b) THE AGRICULTURAL MARKETING CORPORATION (AMC)

The Agricultural Marketing Corporation came into existence in 1963, in succession to its predecessor organization, the then Marketing Department. Its main functions are as follows:

- to provide and maintain adequate outlets for agricultural produce grown primarily for domestic consumption;
- to buy and sell agricultural produce;
- to provide for the collection, transportation, storage, grading, packing and processing of agricultural produce.

The AMC has a main terminal wholesale and retail market in Kingston with 8 other branches placed strategically in other parts of the country. These are as follows:

(1)	May Pen	-	Clarendon
(2)	Christiana	-	Manchester
(3)	Bull Savannah	-	St. Elizabeth
(4)	Montego Bay	-	St. James
(5)	Brown's Town	-	St. Ann
(6)	Morant Bay	-	St. Thomas
(7)	Port Antonio	-	Portland
(8)	Guys Hill	-	St. Mary

These branches are served by a number of buying points which totalled 144 in 1977. Purchased goods move from these buying points where some is sold and the rest is transferred to the main branches in Kingston which has the bulk of the storage and warehouse facilities, and from where most of the distribution takes place.

AMC PRICING SYSTEM

The Agricultural Marketing Corporation purchases from farmers under three conditions with regard to pricing, namely:

(1) at minimum guaranteed prices fixed by the Government for a number of selected crops, of which red peas is included;

(2) at controlled prices, in which the AMC contracts with farmers and farm organization to produce certain commodities - red peas from time to time may be included in these contracts;

(3) at prices fixed monthly by the AMC. These prices are neither minimum guaranteed nor contractual prices.

It is worthwhile to note that the crops enjoying a minimum guaranteed price (including red peas) are also subjected on a monthly basis to price fixing which takes into consideration the demand and supply of the commodity. If the crop is very scarce the AMC from time to time has to offer a price sometimes much greater than the minimum guaranteed price in order to encourage farmers to sell to the AMC.

DISTRIBUTION BY AMC

The majority of the AMC's wholesaling is done at its headquarters in Kingston. The Corporation distributes to hotels, restaurants, Government Institutions (e.g. schools, hospitals), supermarkets, wholesalers, higglers, retail stores etc.

(c) SUPERMARKETS

Although there are many supermarkets throughout Jamaica, more so in the urban areas, the sale of many domestic food crops is fairly negligible. This is not the case with red peas, however, possibly because of its relative case of storage. In recent years Supermarkets have obtained their supply primarily from the AMC, farmers and higglers.

(d) GREEN GROCERIES

Green groceries could be considered a relatively new feature in the distribution of agricultural commodities. They are rather few in numbers, usually small and are privately owned. Supplies are obtained primarily from farmers.

(e) CURBSIDE MARKETS

These are markets existing on shop plazzas, side walks, open lots and road sides. They are increasingly becoming an important market for the trading in domestic crops including red peas.

3.4 THE HIGGLER SYSTEM

As mentioned earlier, there are over 13,000 higglers operating throughout Jamaica, with more than 50 percent purchasing directly from farmers at the farmgate. These higglers either wholesale to other higglers or retail directly to consumers in the markets. The 1976/77 higgler survey showed that women represented 83% of the total number of higglers. The 17% male, to a large extent were farmers selling their own produce.

Higglers not only purchase from the farmers but quite often assist farmers with the reaping, assembling and transporting of the produce from in the field. This practice is not very popular for red peas since most farmers reap the crop, have it dried and shelled before selling it. Some farmers do sell the peas ripe in the pods, however, and under such circumstances the system of reaping and selling in the field is applicable.

Many farmers find this system of selling to the higglers in the field very convenient. Not only do they get assistance to reap their crop, but they also get assistance with transportation.

Table 3.5 shows the distribution of higglers by parishes.

DISTRIBUTION OF HIGGLERS BY PARISH OF MARKET

TABLE 3.5

Parish of Market	No. of Higglers
Kingston & St. Andrew	3,371
St. Thomas	457
Portland	310
St. Mary	278
St. Ann	691
Trelawny	205
St. James	1,080
Hanover	104
Westmoreland	559
St. Elizabeth	425
Manchester	832
Clarendon	951
St. Catherine	1,899
Total	11,162

SOURCE: C. Smikle and H. Taylor "First Draft Report Higgler Survey", 1977.

These higglers obtained their produce from several sources as shown in Table 3.6.

DISTRIBUTION OF HIGGLERS BY SOURCE OF PRODUCE

TABLE 3.6

Source of Produce	No. of Higglers	Percent
Agricultural Marketing Corporation	415	3
Kingston Markets	2,271	17
Country Markets	1,575	12
Farmgate	5,581	42
Own Farm	3,236	24
Wholesalers Outside Established Markets	228	2
Total	13,306	100

SOURCE: Data from C. Smikle and H. Taylor, First Draft Report Higgler Survey, 1977.

Higglers sell from one to a wide range of commodities, but they usually purchase on the average only a small quantity of each commodity. Table 3.7 shows the quantities of commodities purchased weekly by higglers for resale.

AVERAGE QUANTITIES OF SELECTED COMMODITIES PURCHASED PER WEEK FOR RESALE

TABLE 3.7

Selected Commodities	Ave. Quantities Purchased Per Higgler
Green Bananas	32.64 Stems
Coconuts	126.56 No.
Cucumber	50.18 lb.
Oranges	40.62 doz.
Pumpkin	53.39 lb.
Red Peas	10.73 quarts
Sweet Potato	92.78 lb.
Yams	195.49 lb.

SOURCE: C. Smikle and H. Taylor, First Draft Report Higgler Survey.

CHAPTER IV:

PRICING OF RED PEAS

The pricing of red peas is largely determined by supply and demand, which is not necessarily the case with some other commodities where prices are controlled in Jamaica. At the farmgate there is usually some degree of competition between the Agricultural Marketing Corporation and higglers. The higglers usually pay a price greater than the minimum guaranteed price offered by the Agricultural Marketing Corporation.

Imports of red peas have been declining as a percentage of the total supply in recent years. The CIF value of imported red peas has been much lower than the farmgate price of locally produced red peas, indicating that Jamaica is a high cost producer. The AMC has also been the sole wholesale distributor of imported red peas in recent years and this may have had some effect on pricing to the consumer.

4.1 AVERAGE PRICE OF RED PEAS

The average farmgate price for red peas has moved from 63 cents per lb. in 1976, to 139 cents in 1977, and to 152 cents in 1978. During the same p riod, the average retail price moved from 208 cents in 1976 to 249 cents in 1977 to 184 cents in 1978.

Table 4.1 shows the average farmgate and retail prices for the period 1971 to 1978.

CHAPTER IV:

PRICES OF END PRODUCTS

[illegible] product [illegible] is [illegible] marked by supply and demand, which [illegible] whether commodities where prices are [illegible] in question. At the [illegible] there is usually some degree of [illegible] and [illegible] and [illegible] and [illegible] and [illegible] [illegible] The [illegible] prices from the [illegible] [illegible] offered by the [illegible] [illegible] Corporation.

Figures of red [illegible] indicating a percentage of the total supply [illegible] the CIF value of imported red peas has been much lower than the average price of locally produced red peas, indicating that [illegible] is a high [illegible] [illegible] The [illegible] have been the main [illegible] influence of imported [illegible] in recent years and this may have [illegible] effect on prices to the consumer.

[illegible] PRICE OF [illegible] PEAS

The average farmgate price for [illegible] peas from [illegible] cents per lb. in 1976, to [illegible] cents in [illegible] and [illegible] cents in 1978. During the same period the average retail price moved from 50[illegible] cents in 1976 to [illegible] cents in 1977 to 1[illegible] cents in 1978.

Table [illegible] shows the average farmgate and retail prices for the period 1[illegible] - 1[illegible].

ANNUAL AVERAGE FARMGATE AND RETAIL PRICE FOR RED PEAS 1971 - 1978

TABLE 4.1

Year	Farmgate Price per lb.	Retail Price per lb.	% Mark Up
	¢	¢	
1971	31	41	32.3
1972	26	38	46.2
1973	45	53	17.8
1974	53	75	41.5
1975	65	91	40.0
1976	63	208	230.2
1977	139	249	79.1
1978	152	184	21.0

SOURCE: Data Bank, Ministry of Agriculture
N.A. = Not Available

It is interesting to note the sharp increases in farmgate price since 1977. This was partially due to the increase in the minimum guaranteed price paid by A.M.C. from 20 cents per lb in 1976 to 77 cents in 1977. It is also worthy to note that the mark up from the farmgate to delivery to the consumer was as high as 230 percent in 1976. Though there was a decline to 79 percent in 1977, this is still rather high in comparison with former years.

The high retail price for 1976 is not easily explained. It may have been partly due to the fact that total supply was lower than the previous year. In addition imports which have a much lower c.i.f. price than the farmgate price for locally produced red peas, contributed less to total supply than the previous year. Farmers observing the high retail prices in 1976 made strong representations for a better price in 1977, however, and this is reflected in the higher minimum guaranteed price and the even higher price at which they were sold.

4.2 PRICE FLUCTUATIONS

The production and supply of red peas tend to vary from one quarter to the next, and with imports becoming smaller and smaller, prices tend to vary somewhat accordingly. Production and supply are usually greatest in the last quarter of the year followed by the second quarter with the first and third quarters producing smaller quantities.

Table 4.2 shows the production of red peas by quarters for the years 1975 to 1978.

PRODUCTION OF RED PEAS BY QUARTERS 1975-1978

TABLE 4.2

Year	First Quarter	2nd Quarter	3rd Quarter	4th Quarter	Total
1975	448	645	472	672	2,237
1976	805	699	285	516	2,305
1977	613	765	1,018	1,310	3,706
1978	1,755	1,663	1,186	1,090	5,694
Total	3,621	3,772	2,961	3,588	13,942

SOURCE: Data Bank, Ministry of Agriculture.

On the average, price has been highest in the third quarter of the year over the last three years. Though there has been a reasonable amount of price movement from one quarter to the next, it is not possible to establish any trends since the data available only cover a few years.

Table 4.3 shows prices quarterly for the years 1976 to 1978.

QUARTERLY RED PEAS PRICES FOR THE YEARS 1976 - 1978

TABLE 4.3

Cents per lb.

Year	First Quarter	2nd Quarter	3rd Quarter	4th Quarter	Annual Average
1976	63	59	65	67	63
1977	85	132	167	148	139
1978	180	143	132	143	152

SOURCE: Data Bank, Ministry of Agriculture.

4.3 MAIN CAUSES FOR PRICE FLUCTUATION AND THEIR EFFECTS IF ANY ON FARMERS DECISION MAKING

There is a fairly high demand for red peas in Jamaica throughout the year, though the demand seems to be highest in the last quarter of the year. One would expect prices to be higher when supply is low, but this has not necessarily been the case, as can be seen from Tables 4.2 and 4.3. In 1978 for example the first quarter had both the greatest production and the highest price of all the quarters.

A more comprehensive picture may be possible when an analysis is made of the supply and price of substitute peas, like the African red peas, pigeon or guango pea, and cow pea. The first and last quarters are the periods when the quantities of cow pea and guango pea are most plentiful. In 1977 for example the first and last quarters of the year accounted for 1524 tons or 77% of the total annual cow pea and guango pea production. In 1978 these same quarters accounted for 2778 tons or 71% of the 1978 production. In 1977 price was low in the first quarter compared to the other quarters, but in 1978 the first quarter price was the highest for that year.

Tables 4.4 and 4.5 show the production and prices by quarters for the years 1976 to 1978.

TABLE 4.4 QUARTERLY PRODUCTION OF SUBSTITUTE PEAS 1976-1978

TABLE 4.4

Year	First Quarter		Second Quarter		Third Quarter		Fourth Quarter	
	Cow Pea	Guango Pea	Cow Pea	Guango Pea	Cow Pea	Guango Pea	Cow Pea	Guango Pea
1976	142	1,157	180	169	68	3	90	181
1977	76	558	111	79	267	19	402	488
1978	433	1,643	358	225	488	42	340	362

SOURCE: Data Bank and Evaluation Division, M.A.

TABLE 4.5 QUARTERLY FARM GATE PRICES OF SUBSTITUTE PEAS 1976-1978

TABLE 4.5

Year	First Quarter		Second Quarter		Third Quarter		Fourth Quarter	
	Cow Pea	Guango Pea	Cow Pea	Guango Pea	Cow Pea	Guango Pea	Cow Pea	Guango Pea
1976	43	48	44	42	44	58	38	40
1977	52	55	103	128	129	141	127	167
1978	133	153	110	128	106	115	101	107

SOURCE: Data Bank and Evaluation Division, M.A.

It is difficult to show any close correlation between quantities and prices.

In terms of farmers' dicision-making it seems as if fluctuation in prices by quarters is not a major consideration in production decisions. The average price expected for the year seems more important. The single factor which seems to be most important in farmers decision making with regard to production is the weather. Since most farmers who plant red peas use no irrigation they need rainfall for the early weeks of the crop but at the same time rainfall is not wanted when the crop is maturing. As a result of this existing weather and anticipated weather based on past rainfall data are very important in farmers' production decisions.

Red peas is also considered to be a fairly risky crop in Jamaica, due partially to unrealiable seeds, problem of mosaic virus, and heavy rainfall near harvesting. As a result of this, farmers seem reluctant to plant large quantities of red peas at any one time. This is borne out by the fact that although medium to large farmers do plant the crop too (although primarily a small farmer crop) they never plant large acreages.

Whereas many of the domestic food crops face marketing problems from time to time, usually with supply more than demand, which in turn restricts further production this has never been the case with red peas. This is largely due to its good storage ability, and the fact that Jamaica has traditionally produced less than its demand, thus the need to import.

4.4 AN APPROACH TO STABILIZING PRICE AND SUPPLY

Since the production of red peas has depended primarily on rainfall in Jamaica, possibly because it is grown mostly in the hilly areas, it follows that any prolonged drought could severely limit production as was the case in the past. Whereas in the past imports could readily make up shortfalls in production, this situation has changed with the shortage of foreign exchange. One could therefore expect more price fluctuations in the future with major variations in production, which would be tantamount to variations in supply.

Any move to produce more red peas on the plains under irrigation could therefore remove the high dependency on rainfall and could thus even out production from one season to the next. A more even production and supply would tend to even out prices. In addition to the need to remove production from being so highly dependent on the elements, any move to improve storage facilities for red peas will naturally assist also in a more even supply from one period to the next.

CHAPTER V

COMPARATIVE ANALYSIS OF PRODUCTION, MARKETING AND CROP PROSPECTS BETWEEN ALLSIDES, THE CHRISTIANA AREA AND THE REST OF THE ISLAND

5.1 Method and Scale of Production in the Various Areas

In the Allsides and Christiana areas production is done almost entirely by manual labour as is the case in some other hilly areas of the country. In other areas of the country, however, the terrain permits mechanical land preparation.

Production in the Allsides area is confined to small plots and there is interplanting with yams and ginger though there is also pure stand planting. The Allsides property is comprised of 634 acres, with 85 acres comprising farms of ½ to less than 2 acres; 349 acres with farms 2 to less than 5 acres; 178 acres with farms 5 to less than 10 acres.

The majority of the land has slopes ranging from 10° to 30°, with 35% falling between 10° - 20° and 50% falling between 20° - 30°. Over the years the predominant crop in the area has been yams, and red peas was mostly planted in pure stand. The Inter-American Institute of Agricultural Sciences - IICA, in association with the Ministry of Agriculture, has been demonstrating and promoting the economics of multiple cropping systems over the past three years.

The Demonstration Project has successfully grown yams intercropped with peanuts and red peas, yams with Irish potato etc. This is being done on a small scale by the farmers. Whereas the farmers usually cultivate on the slopes, the Demonstration Project terraces the land before establishing its crops.

The scale of red peas production in the Allsides area is usually 0.6 acres or below. Density of plants is much higher on the terraces than has been the tradition in the area. Seeds are planted 3 inches apart, one seed per hole and 30 inches between rows in pure stand. Traditionally, 2 seeds are planted per hole but the planting distance along rows may be up to 12 inches apart.

The Christiana Area from the Land Authority point of view covers some 63,388 acres. The majority of the farm holdings fall within the acreage category of 1 to 5 acres. The 1968-69 census of Agriculture for example showed 16,159 farms in the area of which 9,009 or 55.7% were in the 1 to 5 acre category.

The area is basically hilly as the Allsides area though pockets of level lands can be found. Technically the Allsides area is really a section of the Christiana Area Land Authority. The Christiana Area has similar rainfall, terrain etc., as the Allsides Area. Cropping patterns are also fairly similar, but for the fact that more Irish potato and bananas are grown in other areas in Christiana than at Allsides. For all practical purposes scales and levels of technology in Allsides are very similar to the Christiana Area.

With regard to the scale and method of technology for the rest of the island, there is wide variation. On some of the more level lands as on the plains of St. Elizabeth in the Hounslow Area, lands are prepared mechnically and the crop is irrigated. On the hilly areas of St. Elizabeth such as in the Bull Savannah Area the crop is produced only by manual labout, but mulching is practiced to aid in the retention of

water in the soil and as a weed control measure.

The size of plots vary considerably over the island, ranging from about 0.25 of a square to about 4 acres. On the average however, size of plots is not larger than can be found in the Christiana Area.

5.2 COST OF PRODUCTION AND RETURNS IN THE VARIOUS AREAS

With the exception of the work that is being done at Allsides by IICA with terracing and various mixed cropping trials, the rest of Allsides could be regarded as very similar to the Christiana Area in terms of cost of production and returns per acre for red peas.

Under pure stand planting, the cost of production in the Allsides/Christiana Area is of the order shown in Table 5.1.

COST OF PRODUCING AN ACRE OF RED PEAS IN PURE STAND IN THE ALLSIDES/CHRISTIANA AREA.

TABLE 5.1

Item	Rate	Cost $
LABOUR OPERATIONS		
Land Clearing	$40 per acre	40.00
Forking	$20 per sq.	200.00
Planting Seeds - 6 days	$7 per day	42.00
Weeding - 10 days	$7 per day	70.00
Spraying - 3 days	$7 per day	21.00
Reaping - 4 days	$7 per day	28.00
Shelling & Sifting - 6 days	$7 per day	42.00
Bagging & Transport	55¢ per 100 lb.	3.85
SUB TOTAL		$446.85

(Table Cont'd)

TABLE 5.1 (Cont'd)

Item	Rate	Cost $
MATERIALS		
Seeds - 56 lbs.	$1.50 per lb	84.00
Insecticides/Fungicides	-	16.00
SUB TOTAL		100.00
Contingencies 10% (Labour + Mat.)		55.00
Depreciation 5% Field Operations		22.30
Land Charges	$35 per year	18.00
Interest 6% per Annum		16.50
SUB TOTAL		111.85
Return to Risk and Management	20% Lab. & Mat.	110.00
Total cost of Production		768.70

Marketable Yield = 700 lbs.

Price per lb. (Farm Gate) $1.52

Gross Returns per acre = $1,064

Gross Profit = $405.30

Net Profit = $295.30

COST OF PRODUCING AN ACRE OF RED PEAS IN MIXED STAND IN THE ALLSIDES/CHRISTIANA AREA

TABLE 5.2

Item	Rate	Cost $
LABOUR OPERATIONS		
Land Clearing (Prorated)	$40 per acre	13.00
Forking	$20 per square	67.00
Planting Seeds - 6 man days	$7 per day	42.00
Spraying - 3 days	$7 per day	21.00
Weeding - 10 days (Prorated)	$7 per day	35.00
Reaping - 4 days	$7 per day	28.00
Shelling & Sifting - 6 days	$7 per day	42.00
Bagging & Transport	$0.55 per 100 lb.	3.85
SUB TOTAL		251.85
MATERIALS		
Seeds - 56 lbs.	$1.50 per lb.	84.00
Insecticides/Fungicides	-	16.00
SUB TOTAL		100.00
Contingencies - 10% (Labour & Mat.)		35.00
Depreciation 5% Labour Cost		12.50
Land Charges		12.00
Interest - 6% per annum		10.56
SUB TOTAL		70.06
Return to Risk and Management	20% Lab. & Mat.	70.35
Total Cost of Production		492.26

Marketable Yield = 700 lbs.

Price per lb. (Farm Gate) = $1.52

Gross Returns per acre = $1,064

Gross Profit = $642.09

Net Profit = $571.74

The cost of red peas production under mixed cropping has been done with yam which is an annual crop. For the rest of the island there is a fairly wide range in levels of technology applied to the crop. There is therefore a wide range in the cost of production and returns per acre.

The cost of production and returns in the other hilly areas of the Country could be regarded as fairly similar to the Christiana Area. This applies both to pure stand and mixed crops. On the plains however, cost tends to be somewhat lower, primarily because land is prepared mostly by tractors. As a result, cost of land preparation may be reduced by about $120 per acre under pure stand production.

Table 5.3 shows the cost of production on the plains.

COST OF PRODUCING AN ACRE OF RED PEAS IN PURE STAND (SEMI-MECHANIZED)

TABLE 5.3

Item	Rate	Cost $
Land Clearing	$40 per acre	40.00
Ploughing	$55 per acre	55.00
Harrowing	$45 per acre	45.00
Planting - 6 days	$7 per day	42.00
Spraying 6 days	$7 per day	35.00
Weeding - 10 days	$7 per day	70.00
Reaping - 4 days	$7 per day	28.00
Shelling & Sifting - 6 days	$7 per day	42.00
Bagging & Transport	$0.55 per 100 lbs.	4.70
SUB-TOTAL		362.00
MATERIALS		
Seeds - 64 lbs	$1.50 per lb.	96.00
Rogor - 4 pints	$6.00 per pint	24.00
Chlorodane - 2 pints	$4.00 per pint	8.00
SUB TOTAL		127.70

(Table 5.3 Cont'd)

TABLE 5.3 (Cont'd)

Item	Rate	Cost $
OTHER CHARGES		
CONTINGENCIES: 10% (Labour & Materials)		49.00
5% Field Operations		18.00
LAND CHARGE	$35 per year	18.00
INTEREST	6% per annum	14.00
SUB-TOTAL		99.00
RETURN TO RISK & MANAGEMENT	20% Lab. & Mat.	98.00
TOTAL COST OF PRODUCTION		686.70

Marketable Yield	=	850 lbs.
Price per lb.	=	$1.52
Gross Returns per Acre	=	850 x 1.52 = $1,292
Gross Profit	=	$707.60
Net Profit	=	$604.60

5.3 PROSPECTS FOR AN EXPANSION OF THE CROP IN THE VARIOUS AREAS

From a demand and supply point of view, there is every reason why the production of red peas should be expanded. Jamaica has traditionally depended on imports to complement local production. With the scarcity of foreign exchange, it is now vital that import substitution be achieved wherever possible.

Having accepted the fact that there is a market for increased red peas supplies, the question then is how should this increased production be achieved, and what are the prospects for the various red peas producing areas. The crop seems to be fairly profitable under all the conditions under which it is

grown, but because of the lower cost of land preparation on the plains, the plains may have a comparative advantage. When the crop is grown under a mixed cropping system in the hilly regions such as Allsides and Christiana, then the hilly regions become much more competitive with the plains, and at the existing farm gate price the crop is very profitable.

At present, this crop could not be considered to be an irrigated crop on the plains. Production is still largely dependent on rainfall as is the case in the hilly regions. In terms of "out-of-season" production, then the plains with irrigation water could, and should become important areas of production. Since demand is so great relative to supply, there is not much scope to store large quantities of peas from a high producing season to a low producing season. Whereas in the past imports could easily fill the supply gap in order to satisfy demand in the low production period, this possibility is becoming more and more unlikely. There are therefore great prospects for the plains taking on added significance in total red peas production.

With regard to the hilly areas such as Allsides, Christiana and other areas, the drive should be towards mixed cropping. When peas are grown with other crops like yams and ginger, there is no preceptible reduction in the yields of these crops, while at the same time the land is being used more effeciently. The same is true for labour, since in land preparation and some of the cultural practices such as weeding, the cost can be pro-rated between the two crops, since these exercises would have to be done anyway if any of the crops was being produced in pure stand.

CHAPTER 6

CONCLUSION

Red peas is a very popular grain legume in Jamaica, and although the country has traditionally depended on imports to complement local production, the country can be entirely self-sufficient in this commodity. The crop is grown primarily by small farmers in the hilly regions of the country. Though temperature and rainfall are quite suited to the crop in many of these areas, there is the risk of soil erosion according to the present cultivation practices.

There is no doubt that better soil conservation practices need to be carried out on the hilly areas where red peas are grown. In areas where the soils are deep enough and slopes are below 15°, then it would be feasible to terrace the slopes as is being practiced at Allsides. Where the soils are either not deep enough or slopes are too steep then other soil conservation measures such as hillside ditches, or strip cropping may be practiced.

The crop is considered to be fairly risky in Jamaica. One of the factors contributing to this is uncertainty facing farmers when they purchase seeds. Local seeds sometimes show very high incidence of mosaic virus, whereas sometimes imported seed do not seem to produce well under local climatic conditions. In 1977 for example many farmers lost their crop because a variety purchased from Mexico did not perform well under Jamaican conditions. Although the crop's production depends largely on rainfall, sometimes too much rainfall near harvesting results in loss of a high percentage of the crop. This was clearly the case in June 1979 with the high incidence of rainfall.

On many of soils where red peas are produced, the pH is much too low for the crop to perform optimally. Since the country has an abundance of limestone, then liming the soils should be quite practicable. More research is required, however, on the cost of liming and the response of the crop to liming of acidic soils and thus the increases in yield from liming.

[illegible]

CONCLUSION.

[illegible]

[illegible]

[illegible]

[illegible]

Though some work has been done on fertilizer trials, it is clear that more research is needed on the response of the crop to fertilizer on various soils and what types and amounts should be used in order to obtain optimum production. Not only is more research needed, but equally important is the need to make this information readily available and understandable to farmers. It was very difficult to find information on the results of fertilizer trials, so it is therefore safe to say that this information is at present completely unavailable to farmers.

With imports playing a less important role in supply, due largely to the foreign exchange problem facing the country, it will be necessary to improve local drying and storage facilities so that what is stored can be kept in good condition. It will take sometime before there could be enough locally produced red peas to have any major stock reserves, however. It is therefore important that the irrigated plains should play a more important role in production.

At present the crop is concentrated primarily in the hilly regions, depending on rainfall. With irrigation on the plains, the crop could be produced in the dry season or when there is a drought as the country experienced for several years prior to mid 1977.

With the lower cost of land preparation on the plains, where mechanization is possible, farmers on the hills could lose some of their competitiveness. The cost of irrigation could however, add considerably to cost of production on the plains. In order to increase the profitability of the crop, there seems to be the need for farmers to move towards mixed cropping instead of pure stand. By so doing the expensive costs of land preparation and other labour operations such as weeding can be shared with the crop that is planted with the red peas.

Whereas many of the domestic food crops have a fairly limited demand or have very little storage or shelf life, red peas suffer from none of these limitations. Since when grown as a mixed crop, this crop is very profitable, it can therefore be considered as a crop that should be given a very high priority in the general drive towards self-sufficiency in food.

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