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*Joint symposium on maize and peanut. Held in Suriname
on behalf of the 75th Anniversary of
The Agricultural Experiment Station of Paramaribo.*

November 13 – 18, 1978



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CULTIVATION AND PRODUCTION

A REGIONAL PROJECT FOR PRODUCTION OF GRAIN AND LEGUME

J.A. DUMMETT

CARICOM Corn and Soyabean Company

INTRODUCTION

Corn is grown in Guyana by peasant cultivators as part of a two or three crop rotation following land preparation by slash and burn. The areas where this practice is concentrated are generally along the banks of the Berbice and Pomeroon Rivers, the North West District and the Rupunini District. The area planted seldom exceeds three to five acres, no equipment is used except simple hand tools and there is generally little or no application of fertilizer and chemicals for pest control. Production reaching the market rarely exceeds three million pounds.

The government of Guyana supported in 1969 the formation of a farming operation with the same basic objectives as our Company. This operation was sited near to the site of Caricom Corn and Soyabean Company. It has shown a staggered performance while under the control of one then another Government agency and was closed early in 1978.

As part of the same type slash and burn system some cowpea is grown generally of an indeterminate type.

Soyabean is not a traditional crop of Guyana.

Formation of the Company.

Caricom Corn and Soyabean Company is possible through the realization of two important moves in the English speaking Caribbean; the coming into being of CARICOM and the expressed desire of the territories to make a start towards replacing part of the imported foods by production from within the territories. The program for production is evolving and being expressed through the Caribbean Food Plan. This plan is to be given substance by the Caribbean Food Corporation. Caricom Corn and Soyabean Co. is the first regional company and as such is a bit of an anomaly as the subsidiary was formed before the holding company.

Policy of the Company rests with a non-executive Board of eight directors.

The Governments of Guyana and Trinidad and Tobago nominate three each, St. Kitts/Nevis one and Caribbean Development Bank one.

All staff come under the control of the General Manager. Early in 1976 the three territories of St. Kitts/Nevis, Guyana and Trinidad and Tobago agreed to finance a company in Guyana to produce grain and legumes. The Company has an authorized share capital of G\$ 30 million of which just over G\$ 2 million is subscribed. The Company also received loan finance from the Caribbean Development Bank. The C.D.B. prepared the feasibility report for the venture in 1975.

Project site

The Project is located in what is referred to in Guyana as the Intermediate Savannah. This area is inland, by road approximately 130 miles from Georgetown, and can be reached also by travelling up the Berbice river. The river at the point of the Project is navigable to ships of between 500 - 700 tons.

Symposium on maize and peanut, Paramaribo,

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Rainfall follows the pattern of a long season (May to August) and a short season (December to January). Temperatures range around 80 to 85°F (26 – 28°C). The topography is rolling with hills 200 - 300 feet with slopes in some areas exceeding 10°. Soils that are being put under cultivation are of the „Brown Sands” which range between loamy sand and sandy loam and are under grass and shrub in the natural state. These soils are characterized as acid, average pH 4, high aluminum, low organic matter, very low nutrient status lacking in all nutrients needed for the plants the Company cultivates.

Production assumes applications of lime and high levels of complete fertilization applied in split applications.

Before moving from the description of the Project site, I must mention that the area to be developed was uninhabited and the Company had had to start from a position of first arrivals. A total infrastructure has to be created. The construction of bridges, roads, houses, bonds and the like, are being carried out and financed by the Company. There was no community from which workers and staff could commute to the site during this phase. All concerned lived in tents and in fact development of fields and land preparation for the first crop, was carried out simultaneously with the development of infrastructure.

Type of production

The main objective of the Company is to produce food on a large scale at acceptable prices. The Project is, therefore capital intensive and success is dependent on high levels of management and labour efficiency. Since two crops per year are programmed there is little time between harvest of a crop and the planting of the following crop. Land preparation operations are beased on a time allowance of only 4 to 5 weeks in the long dry season (following the long wet) and 3 to 4 weeks in the short dry. The rate at which an operation can be carried out obviously is dependent on the machine capability available but this in turn is dictated by financial considerations. Since the original feasibility study all costs have escalated. The amount of finance has not increased as yet and although prices of products are increasing there is the inevitable time lag.

Our task then can be seen as relating several compounds:

- The set of technical data required for the optimum performance of the crop.
- The performance of machinery under local conditions.
- Standards of performance expected from the workers.

From this we must work out systems of management that will make it possible to produce three or four crops on the scale envisaged and the mix must be such that the overall Project is financially viable. To arrive at a program for any aspect of the production sequence, multiple factors have to be considered. Even though there may be a mathematical solution, values will have to be attributed to the factors which we don't have at present. We are at the stage now, where these programs are largely based on intuition. Harvesting is offered as an example, and the following factors are offered as important:

- the minium and maximum percentage moisture acceptable without affecting market quality and/or seed.
- the number of days required for field preparation for the following crop.
- the capital and running cost of employing greater combine capacity.
- the cost of fuel and the dryer capacity.

Maize — Cultivation and production

- the degree of combine losses acceptable at harvest due to level of moisture in the grain.
- capacity of movers to haul grain from the field to dryer or storage.
- capacity of on site storage.

These and other factors are constantly shifting as related costs are mostly influenced by external circumstances and political considerations.

Material handling

As already mentioned the Project is sited in an area where there is no community nearby which can serve as a source of seasonal labour. This situation coupled with the fact that the Company imports directly and stocks all the heavy and bulky inputs makes material handling an important consideration. There is a tendency in project design to pay scant attention to these vital activities which turn out to be the most important constraints to timely operations. For example, even at the present relatively small scale of operation we use 2 to 2½ tons of blended fertilizer per hour of planting and there are many steps in handling fertilizer between picking up a bag in storage and applying the fertilizer to the soil through the planter.

Risk for weather conditions.

Crop production is based entirely on rainfall. The short rainy season is not of sufficient duration to support the Jupiter variety of soyabeans. There is also some risk to cover during this season. At present we do not think the risk to cover is sufficiently high to not plant corn. With further experience the planting of corn may be limited to the long rainy season.

There is generally sufficient rain in the long rainy season to carry all crops.

Cowpea (Black eye) is considered to have a fair degree of risk from useasonal weather. A marketable crop is highly depended on accurate timing of rainfall. If the rains cease too early the result is stunted plants that are low in yield and very difficult to harvest. Extended rainfall promotes fungus which causes severe discolouration in black eye.

Pigeon pea has been grown succesfully in both seasons and we are now evaluating it as a dry pea. This crop promises to have a strong market demand and offers other cultural advantages.

Production costs

As an indication of cost and for compartion purposes approximate figures for corn are offered in the table below. These are a first pull out from the last crop (planted May '78) and must be accepted as tentative.

A regional project for production of grain and legume

Table 1. Cost per acre corn given in G\$

	Labour		Machine		Material
	Hrs	\$	Hrs	\$	\$
Land preparation	0.40	0.70	0.40	12.00	
Harrowing (preplant)	0.09	0.16	0.10	4.68	
Herbicide	0.87	1.30	0.70	15.50	14.00
Blending	3.40	3.32	0.19	1.90	
Planting (incl. fertilizing)	1.02	1.53	0.41	16.82	293.00
Fertilizing (side dressing only)	4.93	7.39	1.45	40.05	
Spraying (pest control)	0.86	1.29	0.68	15.36	21.00
Harvesting	2.26	4.44	4.44	15.54	
Drying	1.25	11.25	1.56	3.12	
Tot. operational cost \$ 484.35					

APPENDIX

SEED

Corn

Pioneer 306 B standard use. 1st planting May 1977 Currently evaluating Toxapeno Ministry of Agriculture Guyana selection)

Cowpea

Black-California No 5-1st planting May 1977 (both imported and Guyana selections currently producing own requirements)

Soyabean

Jupiter — 1st planting May 1978. Seed from Chagaramas Development Authority, Trinidad and Tobago.

Pigeon pea

VWI 17-st planting Feb. 1978 seed from V.W.I.
VWI 26-1st planting June 1978 St. Augustin T.T.

INSECTICIDES/FUNGICIDES

Corn

Tried a whole range. Min of Agri-Guyana recommends
Monocrotophos 60% active ingredient 20 ml per are major pest at all stages of growth.

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Soya

Minor infestation so far. Dipterex effective.

Black-eye Sevin Dipterex

Dithane M 45 usually applied as one or two sprays before beans start to dry.

WEEDICIDES

Corn

Atrazine — no serious problem as yet. Only spot applications.

Soyabeans

Planavin. Will evaluate Trifuralin

Black eye

No serious problem as yet

FERTILIZERS

Nitrogen

Corn from Diammonium Phosphate & urea

Soyabean from Diammonium Phosphate & sulphate of ammonia

Blackeye from Diammonium Phosphate & sulphate of ammonia

Phosphorus

Corn from Diammonium Phosphate & triple super phosphate

Soyabean from Diammonium Phosphate & triple super phosphate

Blackeye from Diammonium Phosphate & triple super phosphate

Potash

Corn from Muriate of Potash & Potassium Magnesium Sulphate

Soyabean from Muriate of Potash & Potassium Magnesium Sulphate

Black-eye " " " " " " " "

Magnesium

Corn Potassium Magnesium Sulphate

Soyabean Potassium Magnesium Sulphate

Black-eye " " "

A regional project for production of grain and legume

Trace minerals

Corn Fritted trace elements
Soyabean Fritted trace elements
Black-eye " " "

Lime

Ground limestone
Standard practice apply initially 1 ton/acre
Further application rates yet to be finalized

Inoculum for legumes prepared by Ministry of Agriculture, Guyana

Standard field practices

(May be varied by weeds, untimely rain & other factors)

Natural state

1. Clearing & leveling with light bulldozer -- to remove scrub, the odd tree; level termite hills.
2. Plough with heavy harrow
3. Distribute lime
4. Harrow to incorporate lime
5. Harrow (once or twice) for seed bed preparation
6. Plant with fertilizer
7. Spray insecticide/fungicide — high clearance ground sprayer, will move to aircraft by next crop.
8. Side dress fertilizer (one or two applications)
9. Harvest
10. Corn stalks left after harvest slashed with rotary slashes.

If herbicide used applied before (6)

If weeds evident interrow cultivate.

Maize – Cultivation and production

NAME OF PAPER: A regional project production of grain and legumes
(J.A. Dumett)

Question by: Errol B. Whyte
Country: Barbados

QUESTION: What is the current average production of maize-tonnes/ha (tons/acre)?

ANSWER: Yield to date inconclusive.
Much depends on the number of crops previously planted.
Experience indicate so far:

1. As a first crop planted for first time on virgin fields.
Yield very variable from approximately 0.25 to 0.75 short tons/acre.
2. As a second or third crop approx. 1.0 to 1.5 tons/acre.

Question by: R. Parsan
Country: Suriname

QUESTION: What is* the time between clearing and leaving and planting?

ANSWER: Clearing and leveling considered one operation.
Depending on season liming can be carried out and worked in.
Planting is carried out between two and three months after liming.