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16.2

SEED PRODUCTION AND DISTRIBUTION

IN GUYANA

WITH PARTICULAR REFERENCE

TO

BLACK EYE PEA (*VIGIA UNGUICULATA*)

INTER-AMERICAN INSTITUTE OF AGRICULTURAL

SCIENCES - IIAS

SIMON BOLIVAR FUND

GEORGETOWN, GUYANA

JUNE, 1978

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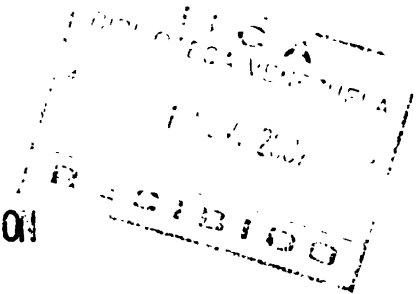
NATIONAL LEGUME AND CASSAVA PROGRAMME

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SEED PRODUCTION AND DISTRIBUTION
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TO
BLACKEYE PEA (VIGNA UNGUICULATA)

R.E. PIERRE

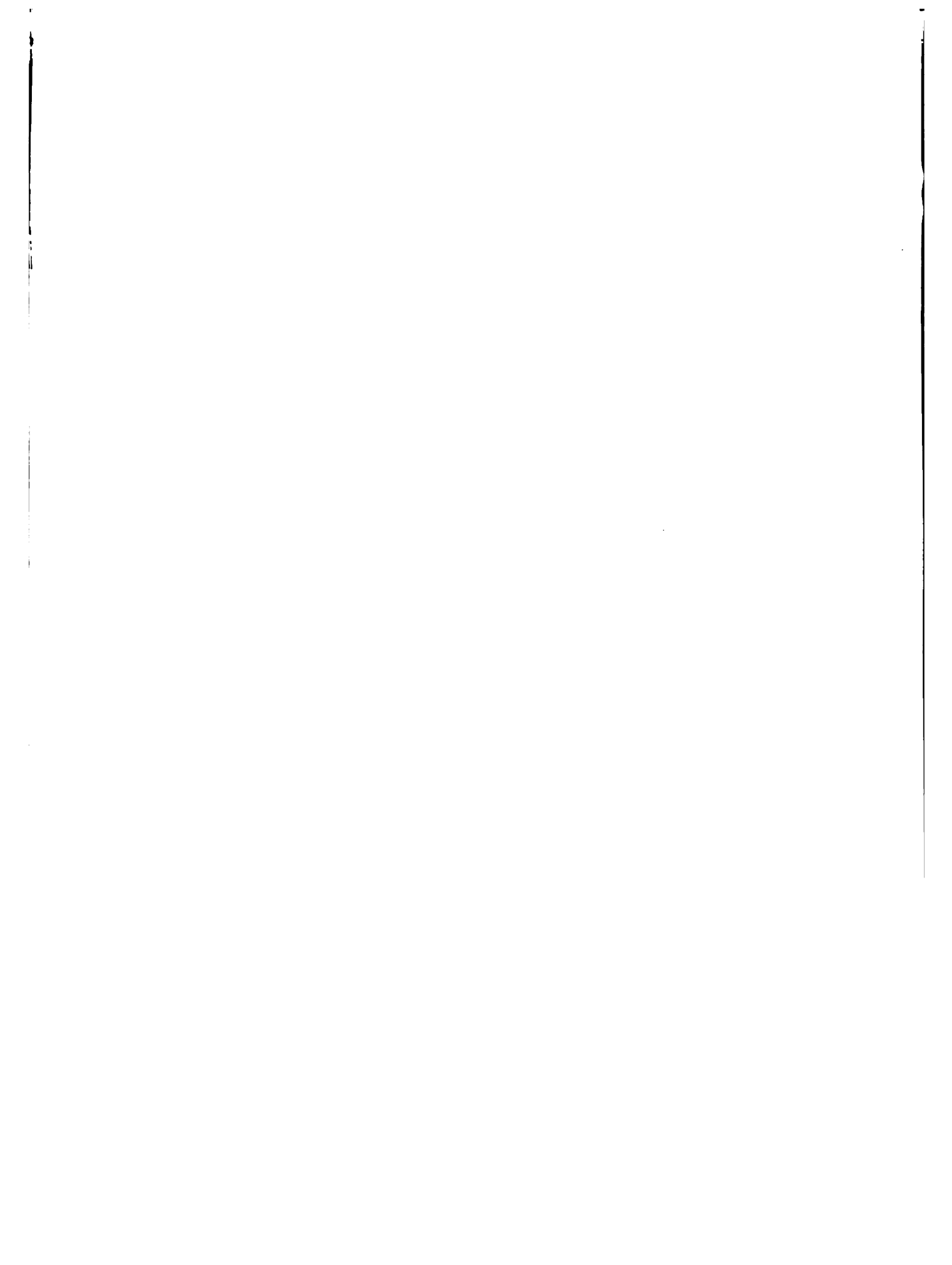
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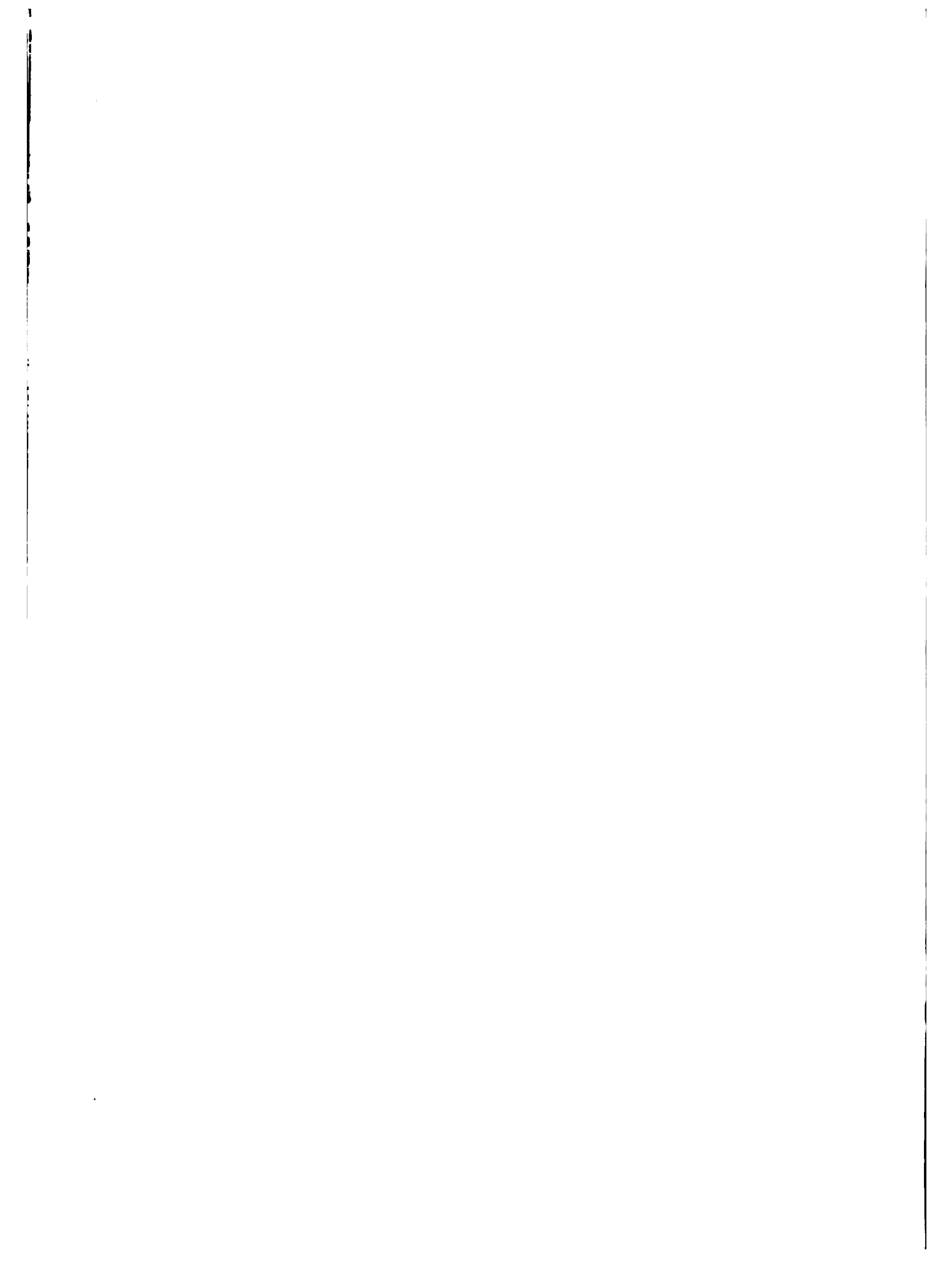


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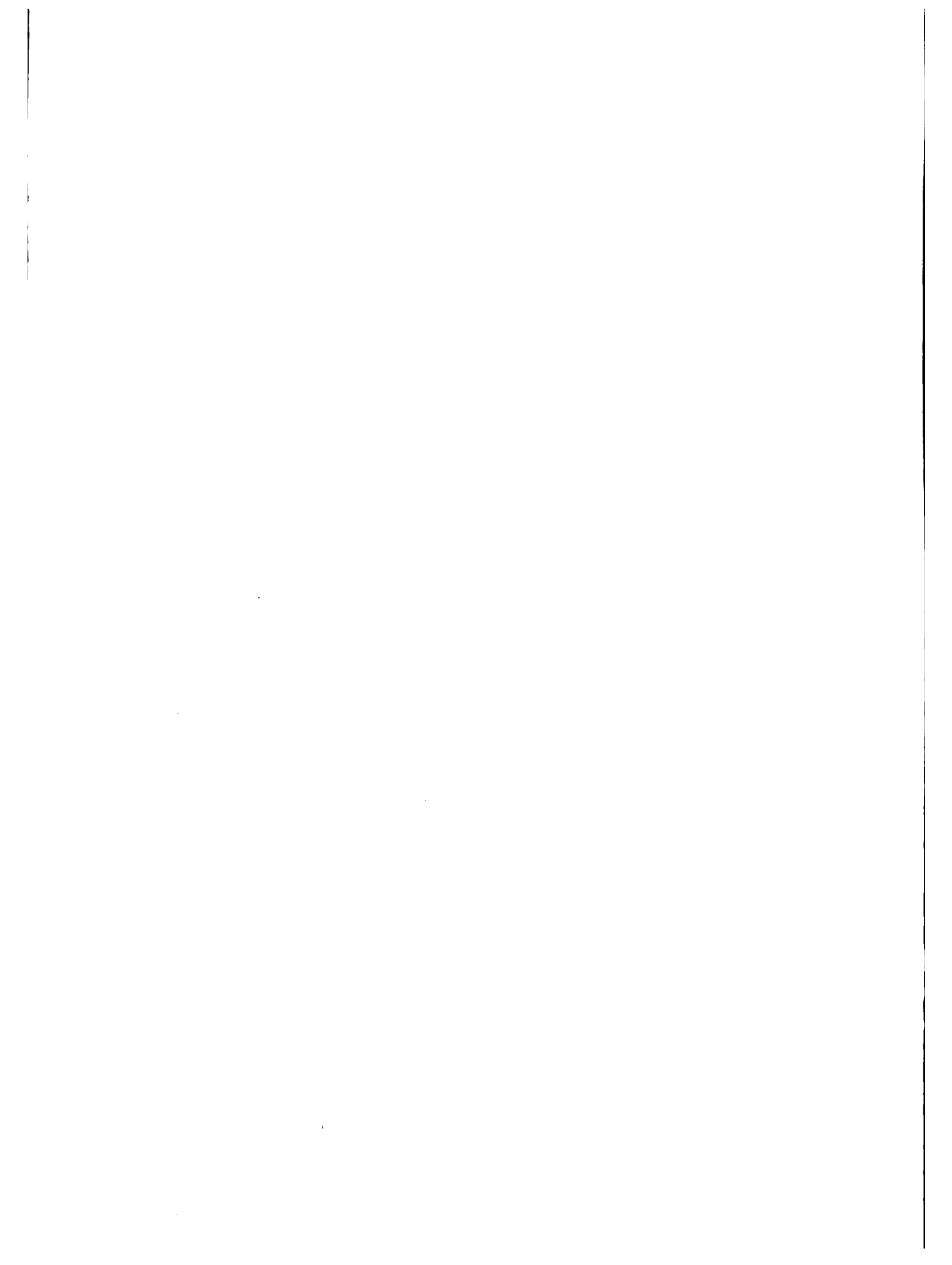
The writer wishes to acknowledge the assistance and cooperation given by Mr. Neville McAndrew, Officer-in-charge of the Seed Technology Unit, Mon Repos and other members of staff of the Unit.

REP



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INTRODUCTION

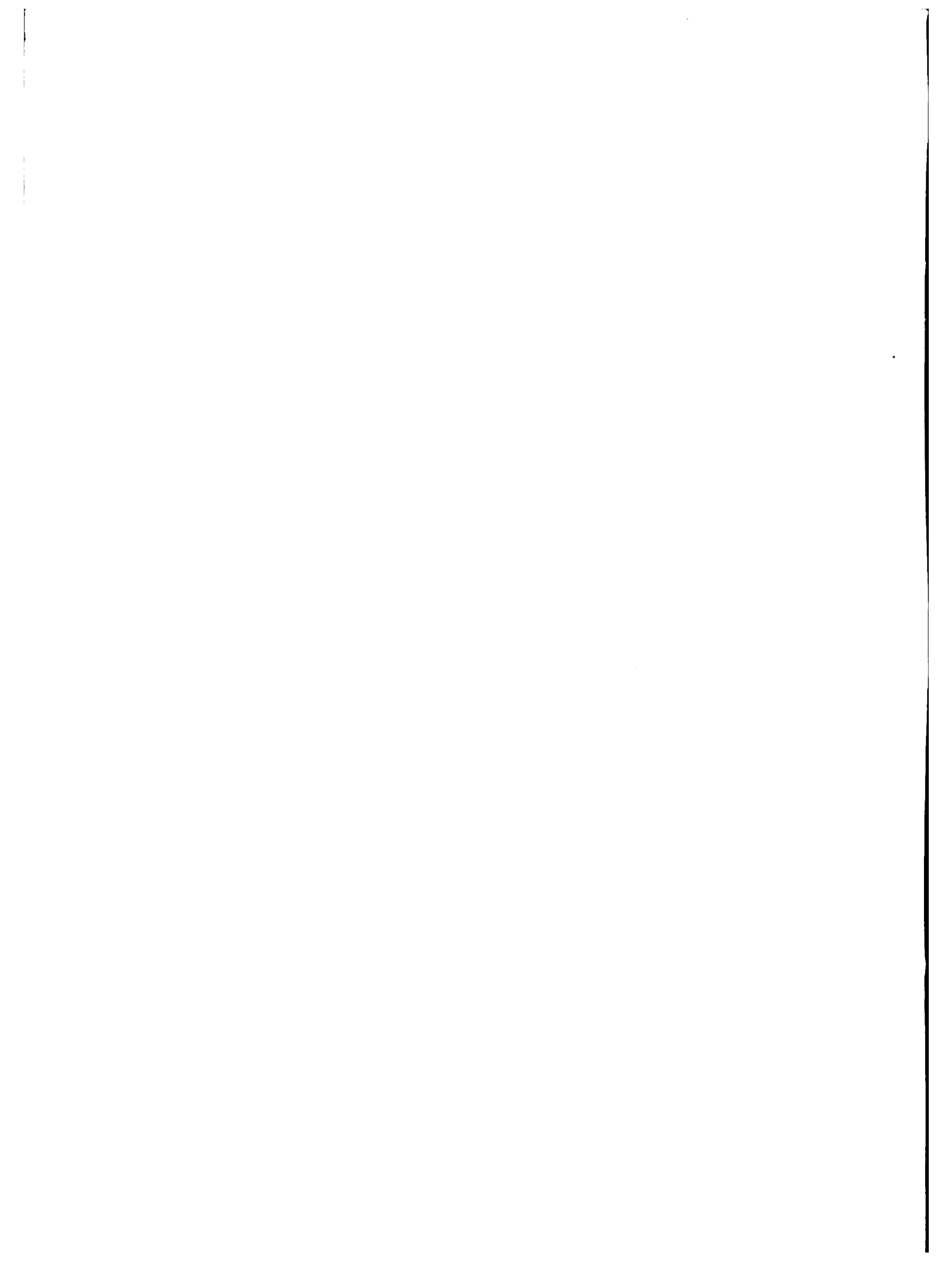
A system to provide farmers with good seed is a pre-requisite to any effort to improve agricultural production and productivity . Without the ready availability of viable, disease-free seed of suitably adapted varieties, farmers are likely to experience crop failures and economic losses, and national production targets are unlikely to be attained.

Guyana is placing major emphasis on the agricultural sector in its development strategy. There is, therefore, a great need for the establishment of an organised seed industry in support of the country's development thrust. Relatively large quantities of seed of various sorts are imported annually resulting in a drain on scarce foreign exchange. Admittedly, the importation of certain types of seed is likely to continue. Many of the "cool season" vegetable crops, for example, will not seed under Guyana's climatic conditions. In addition, the required quantities and value of certain seed types are insufficient to justify establishment of the necessary production infrastructure.

But there are some seeds that can be produced locally. The legumes (cowpea, peanut, pigeon pea, soyabean, mung), corn and a few selected vegetables such as the cucurbits, ochro, egg plant, tomato are some of the crops for which local seed production is possible.

There are many advantages to local seed production. These include:

- foreign exchange savings
- employment creation
- timely availability of planting material
- elimination of transit losses including loss of viability due to inadequate shipping environment.



This paper is concerned primarily with an assessment of the current situation in regard to the production and distribution of blackeye pea seed material but several aspects are applicable to other crops, especially the other legumes.

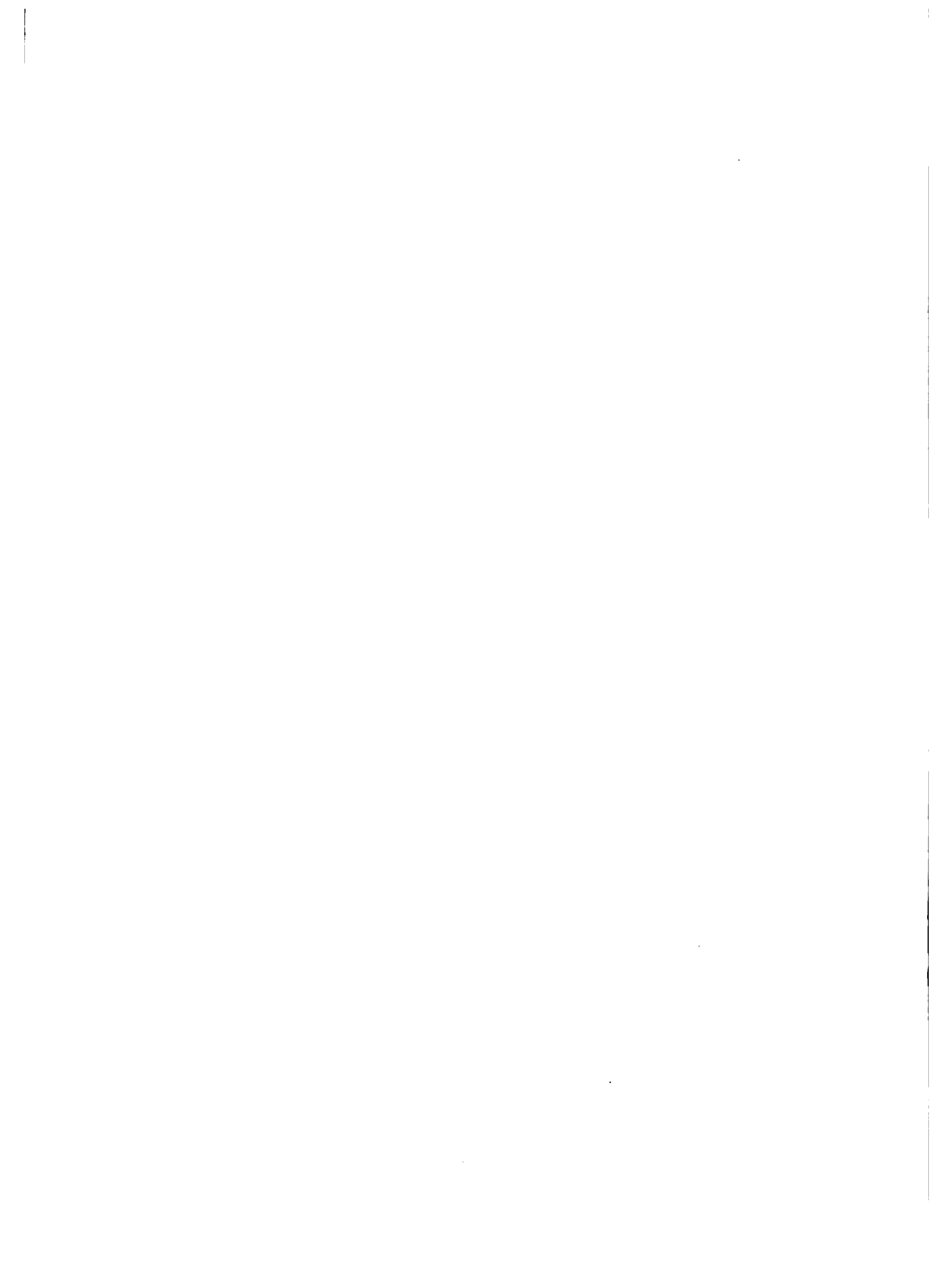
DOMESTIC PRODUCTION OF BLACKEYE PEA

The Government of Guyana has initiated a National Grain Legume Project aimed at attaining self-sufficiency in legumes. The main crop involved is blackeye pea and as an incentive to production, Government provided free seeds and other inputs (fertilizers, pesticides) at subsidised prices to farmers initially. Because of its financial situation, Government has recently withdrawn these subsidies and farmers now have to pay \$1.00 per lb for seed and higher prices for other inputs.

The project optimistically envisaged the establishment of approximately 13,000 acres of blackeye pea in 1978. Assuming that this target will be realized at some future date, the seed requirements will be in the order of 325,000 lb. With an estimated yield of 500 lb per acre, some 650 acres will be required for seed production if all the planting material were to be produced locally.

In general, legume seeds are not too difficult to produce. This is due to the fact that they are largely self-pollinated. Ideally, legume seeds should be produced in dry areas under furrow irrigation to reduce the possibility of spread of seed borne diseases. This system requires proper land grading, an adequate source of water and appropriate equipment for irrigation. This is particularly critical for dry bean (Phaseolus vulgaris) which is susceptible to serious seed borne diseases (anthracnose bacterial blight, bean common mosaic).

Since the most important legume in Guyana is blackeye (Vigna unguiculata) which is somewhat less prone to seed borne diseases, good quality seeds can be produced under rain-fed conditions with proper timing



of plantings to ensure maturation in a predictably dry period.

Although weather conditions vary in different parts of the country the following general pattern occurs in many areas.

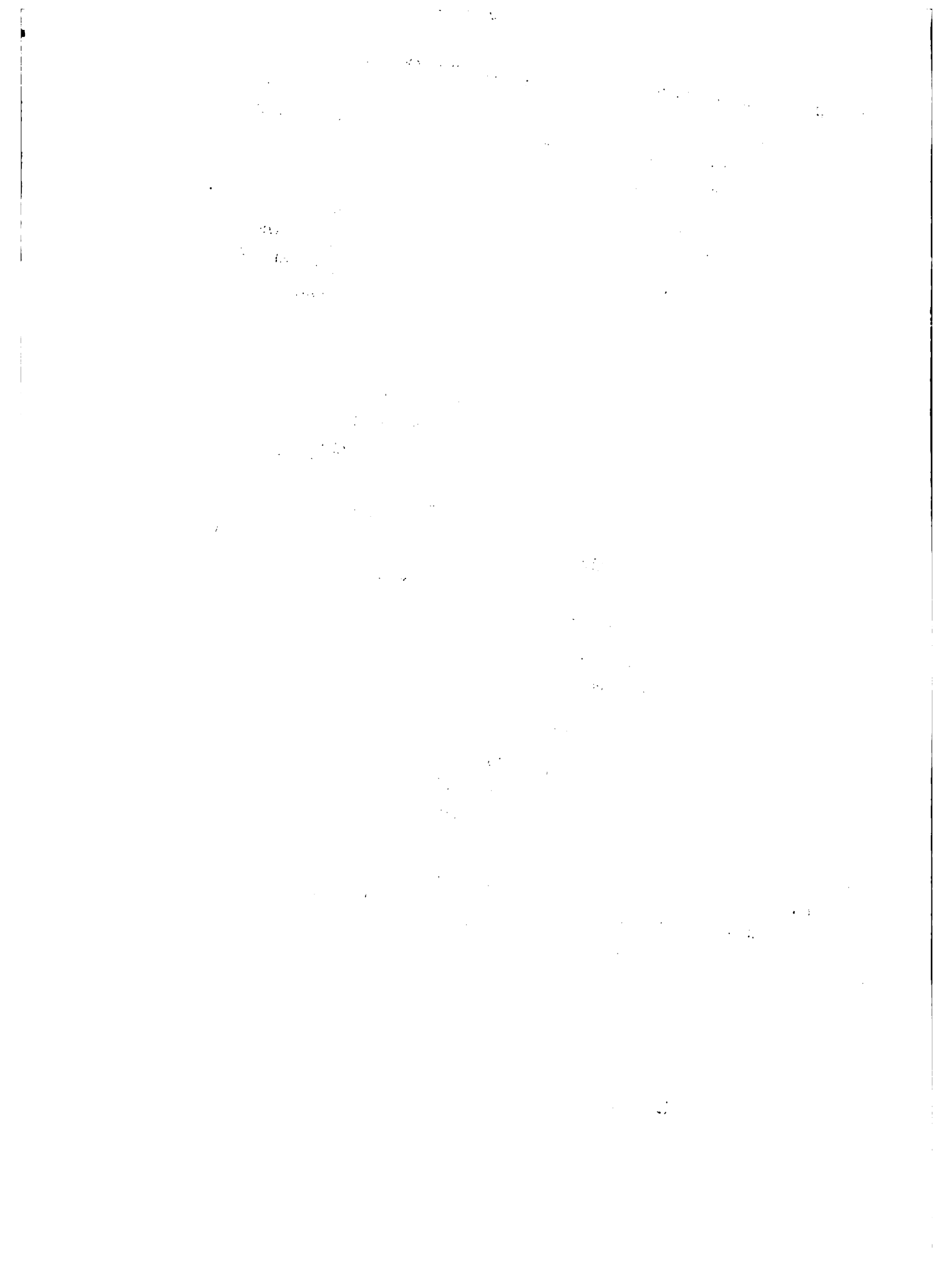
- | | |
|--------------------|----------------------|
| - long wet season | May to August |
| - dry season | September to October |
| - short wet season | November to January |
| - dry season | February to April |

Rainfall figures for the Botanical Gardens, Georgetown for the years 1974 to 1978 are given in Table 1. whereas Table 2. shows the 75% rainfall probability and atmospheric water balance for three stations - Georgetown, Ebini and Wauna.

With short-term legume crops like blackeye, the more favourable period for seed production and indeed, for largescale cultivation on the coastal areas, should be the short wet season with plantings in November/December for harvest in February/March. Rainfall during this season generally is much less intense than in the mid-year season.

Within recent times, relatively large quantities of blackeye pea seeds have been produced locally. Data on imports and local production of seed for the period 1972 through 1977 are summarised in Table 3.

Local seeds were produced largely at the agricultural stations (Ebini, Kairuni, Mon Repos, Long Creek) but recently fair quantities have been obtained from State Corporations - Guyana Rice Board (GRB), Guyana Sugar Corporation (Guysuco), and Guyana Agricultural Products Corporation (GAPC). Production by farmers has been minimal except for the years 1975 and 1976 when a single farmer produced approximately 26,000 lb and 13,000 lb, respectively (Table 4).



Data on the monthly collection of blackeye pea seeds by the Ministry of Agriculture are given in Table 5. This shows a rather unexpected spread, particularly in 1977 when collections were made during every month except April. Although this does not necessarily reflect the pattern of production because of the possibility of on-farm storage prior to delivery to the Seed Technology Unit, such storage is unlikely to be extensive and it would appear that more attention ought to be paid to time of planting in order to reduce the risk of crop failure due to adverse weather. This is particularly important when it is realised that some 89% of the seed collected during 1977 were produced by State Corporations - a fact which implies large scale cultivation and, therefore, higher risk.

EXISTING FACILITIES

The Ministry of Agriculture has a Seed Technology Unit located at the Central Agricultural Station at Mon Repos which has responsibility for procurement, processing, storage and distribution of seeds. The main seed types currently handled by the Unit are blackeye pea, corn, soyabean and cotton, and the facilities include a seed processing plant, seed laboratory and seed store, plus offices.

The equipment list follows:

(a) Seed Processing Plant

- One small pullman thresher
- Two large seed cleaners
- One Cecoco bean and pea grader
- One slurry seed treater
- One scalper
- Three Cecoco batch driers - capacity 5-6,000 lb each
- One fumigation chamber +
- One gravity separator +
- + currently out-of-order

1. The first part of the document discusses the importance of maintaining accurate records of all transactions.

2. It is essential to ensure that all entries are supported by proper documentation and receipts.

3. Regular audits should be conducted to verify the accuracy of the records and identify any discrepancies.

4. The second part of the document outlines the procedures for handling disputes and resolving conflicts.

5. It is important to establish clear communication channels and protocols for addressing any issues that arise.

6. The document also provides guidance on how to maintain confidentiality and protect sensitive information.

7. Finally, it emphasizes the need for ongoing training and education to ensure that all staff members are up-to-date on the latest practices.

8. The document concludes by reiterating the importance of transparency and accountability in all business operations.

9. It is hoped that these guidelines will help organizations to improve their internal controls and overall performance.

10. For more information, please contact the relevant department or refer to the attached documents.

(b) Seed Laboratory

Two temperature regulated germination chambers
Two small fumigation chambers
Scales
Sampler
Miscellaneous Laboratory equipment
Lighted benches for peat/soil germination tests

(c) Seed Storage

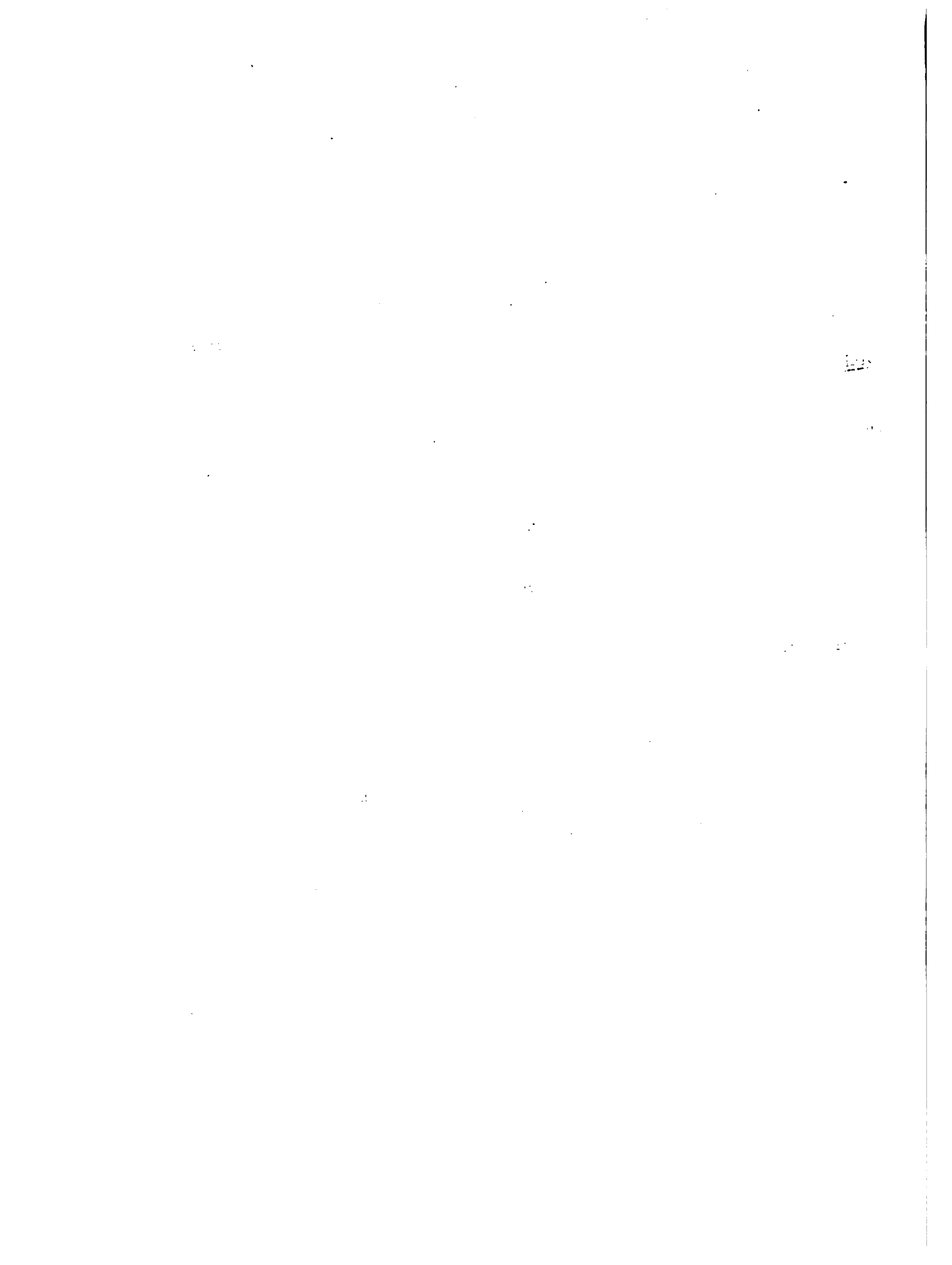
Three rooms each approximately 30' x 30' x 9' fitted with air-conditioning units and dehumidifiers plus one small room which can be modified for storage of small samples. The storage capacity is estimated at approximately 200,000 lb.

STAFF

The Unit is managed by an Agricultural Officer (Seed Technology) who is assisted by two Technical Assistants and other supporting staff. The two Technical Assistants attached to the Unit have received training in Seed Technology and infact, one has only recently returned from New Zealand. The other previously received training in Canada. The Agricultural Officer, on the other hand, has a degree in agriculture but received no special training in Seed Technology.

SEED PROCUREMENT

At present, there are no seed farms in Guyana. A producing agency may offer seeds to the Ministry of Agriculture or the Ministry may request same. In either case, the seeds are subjected to preliminary inspection at source and sampled for laboratory testing. If the results of the tests are satisfactory the seeds are purchased and processed by the Unit.



LABORATORY TESTS

Tests are carried out to determine seed purity, percentage germination under various conditions, and moisture content. The weight per bushel is also determined before and after processing to provide an estimate of the marketable material.

SEED PROCESSING

Seeds are dried to a moisture content of about 10%. The drying temperature depends on the initial moisture content of the seeds as follows:

- About 16% - drying temperature 90°F
- 12 - 16% - drying temperature 95°F
- Under 11% - drying temperature 100°F

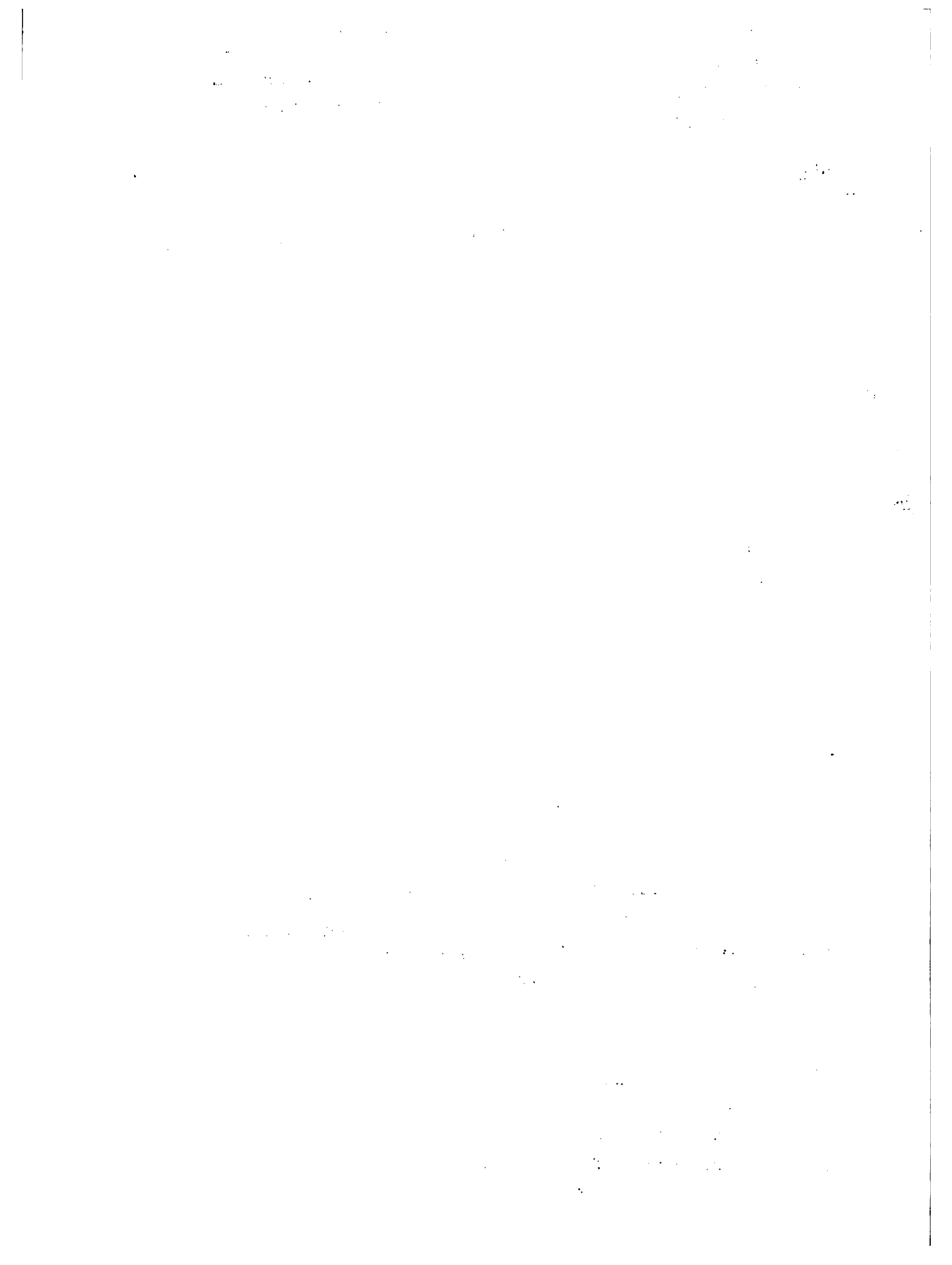
Seeds are then cleaned, graded, bagged, appropriately labelled, fumigated and stored.

STORAGE

Bags of fumigated seeds are stacked on wooden pallets in air-conditioned store rooms. Room temperatures are kept between 60 - 64°F as far as possible and relative humidity at about 45%. Store rooms are sprayed weekly with the insecticide vapona (dimethyl 2, 2 dichloro vinyl phosphate). In addition, store rooms are sealed and fumigated once every 4 - 6 weeks.

SEED DISTRIBUTION

The Seed Technology Unit requires some 2 - 3 days notice for treatment of seed prior to distribution. Seeds are treated with Thiram or Agrosan. Thiram is the preferred fungicide as there are indications that Agrosan suppresses Rhizobium nodulation. No insecticides are used because of reports that some people eat treated seeds. Delivery is made directly to State Corporations. Seeds for small farmers are distributed through the Agricultural offices in the different districts.



RECOMMENDATIONS

There are a number of areas in which the present system can be improved with minimal inputs and it is recommended that these be implemented as soon as possible.

1. Identification of specific seed producing agencies

It has been pointed out that there are no seed farms per se in the country. A step in that direction will be the identification of specific agencies as seed producers and developing and implementing with these agencies the basic requirements for the production of good quality seeds e.g.

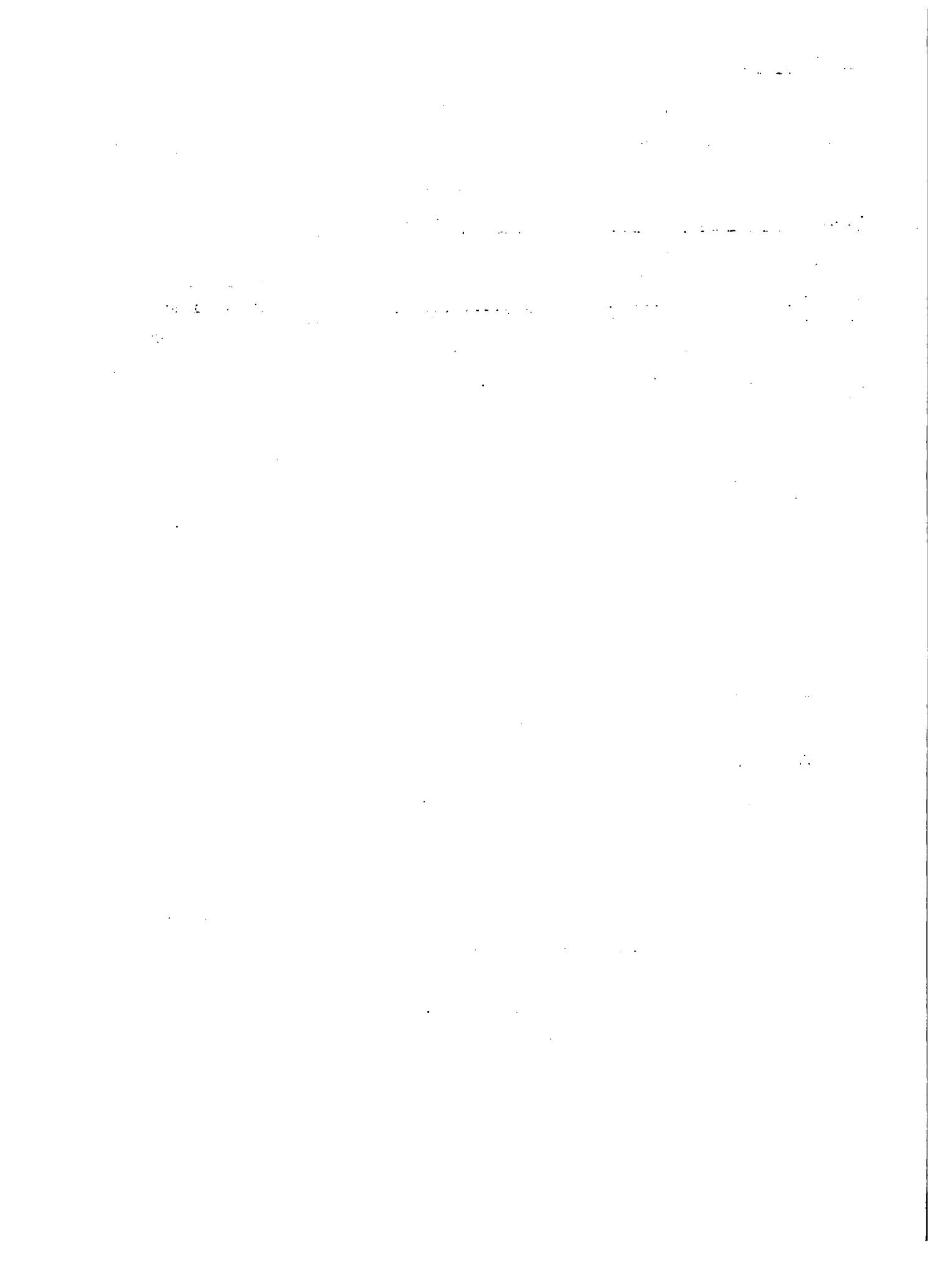
- disease and pest control
- weed control
- roguing
- timeliness of planting and harvest to reduce losses due to adverse weather conditions
- post-harvest handling of seed (threshing, drying etc) to reduce seed damage and retain high viability
- isolation distances between varieties.

2. Introduction of a price incentive for seed production

Currently, seeds for planting are purchased at the same price as consumer material. There is, therefore, no incentive to adopt the more rigid practices associated with the production of good quality seed.

3. Field Inspection of Plantings for Seed Production

This is essential to ensure that the selected agencies comply with the basic requirements as indicated earlier. Field inspectors will have to be trained in the various aspects of seed production including:



- agronomic practices
- identification and control of field diseases and pests
- seed borne diseases
- storage pests, particularly those which begin infestation in the field such as bruchids.
- variety identification

4. Preparation of a working manual on seed production for use by seed producers and inspectors

This manual should include detailed description of varieties in use.

5. Use of insecticide/fungicide mixture in seed treatment rather than fungicide only

The need for this has been recognised but it has not been implemented because of reports that some farmers eat seeds that are intended for use as planting material. There is obvious need for education here. The inclusion of a colour marker in the seed treatment chemical should be helpful.

6. Up-grading existing facilities

The existing processing facilities at Mon Repos are adequate to handle some 20,000 lb seed per week. This limit is imposed mainly by the restricted capacity of the fumigation chamber (100 x 100 lb every 3 days). An additional fumigation chamber of equivalent capacity seems desirable.

In addition, the provision of a small air-conditioned storeroom in each district should greatly reduce the risk of loss of seed viability and insect damage to untreated (insecticide) seed.

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SEED INDUSTRY

An organized programme for the production and distribution of high quality planting material to farmers as an integral part of any sustained effort to increase agricultural production and productivity. Efforts should be made, therefore, to organize what might be considered a National Seed Industry involving all aspects of production, processing, quality control, storage, marketing and distribution. Such a system should be closely linked to crop research aimed at identification and development of suitably adapted high-yielding varieties of selected crops that are tolerant or resistant to pests and diseases.

Initially, a Committee for Seed Improvement should be established to:

- (a) Formulate realistic proposals for seed production in keeping with national needs, priorities and targets.
- (b) Determine terms of reference for an organization - National Seed Agency to produce, process, control and distribute high quality, disease-free seed.
- (c) Draft appropriate legislation and regulations for the seed industry.
- (d) Identify suitable areas for seed production and location of additional equipment and facilities for processing and storage bearing in mind such factors as accessibility, water, land clearing, levelling etc.
- (e) Determine personnel requirements and training needs for the industry.

Table 2. Monthly rainfall probabilities (75%) in inches - 1951 - 1975^(a)

Month	Georgetown		Ebini		Wauna	
	Rainfall	AWB	Rainfall	AWB	Rainfall	AWB
January	4.89	-0.06	4.10	-0.72	2.59	-1.83
February	1.48	-3.86	2.32	-2.99	1.35	-3.59
March	1.47	-5.18	2.68	-3.52	2.35	-2.97
April	2.89	-3.19	2.70	-3.67	2.05	-4.10
May	6.52	1.08	8.80	3.08	7.30	1.56
June	11.20	6.73	8.76	3.82	11.34	6.71
July	8.81	4.96	10.28	5.11	10.56	6.71
August	4.91	-0.74	5.87	0.02	8.52	3.25
September	2.07	-4.07	1.82	-5.06	8.84	3.88
October	2.38	-3.61	1.79	-5.57	8.02	3.26
November	3.71	-1.42	4.20	-2.05	7.88	3.98
December	5.28	0.73	3.88	-1.47	8.15	5.13

AWB - Atmospheric Water Balance which is the difference between rainfall and evapotranspiration.

(a) W. Forsythe (1977) Use of climatic data in agricultural planning and evaluating and managing soil water resources in Guyana. Mimeo.

Table 3. Imported and locally produced seeds (Blackeye) collected and distributed by the Ministry of Agriculture.

Year	Imported (lb)	Local (lb)	Total	Local as % of total
1972	10,000			
1973	14,000			
1974	10,000	8,740	18,740	46.6
1975	13,800	74,081	87,881	84.3
1976	121,100	37,886	158,986	23.8
1977	50,000	93,658	143,658	65.2

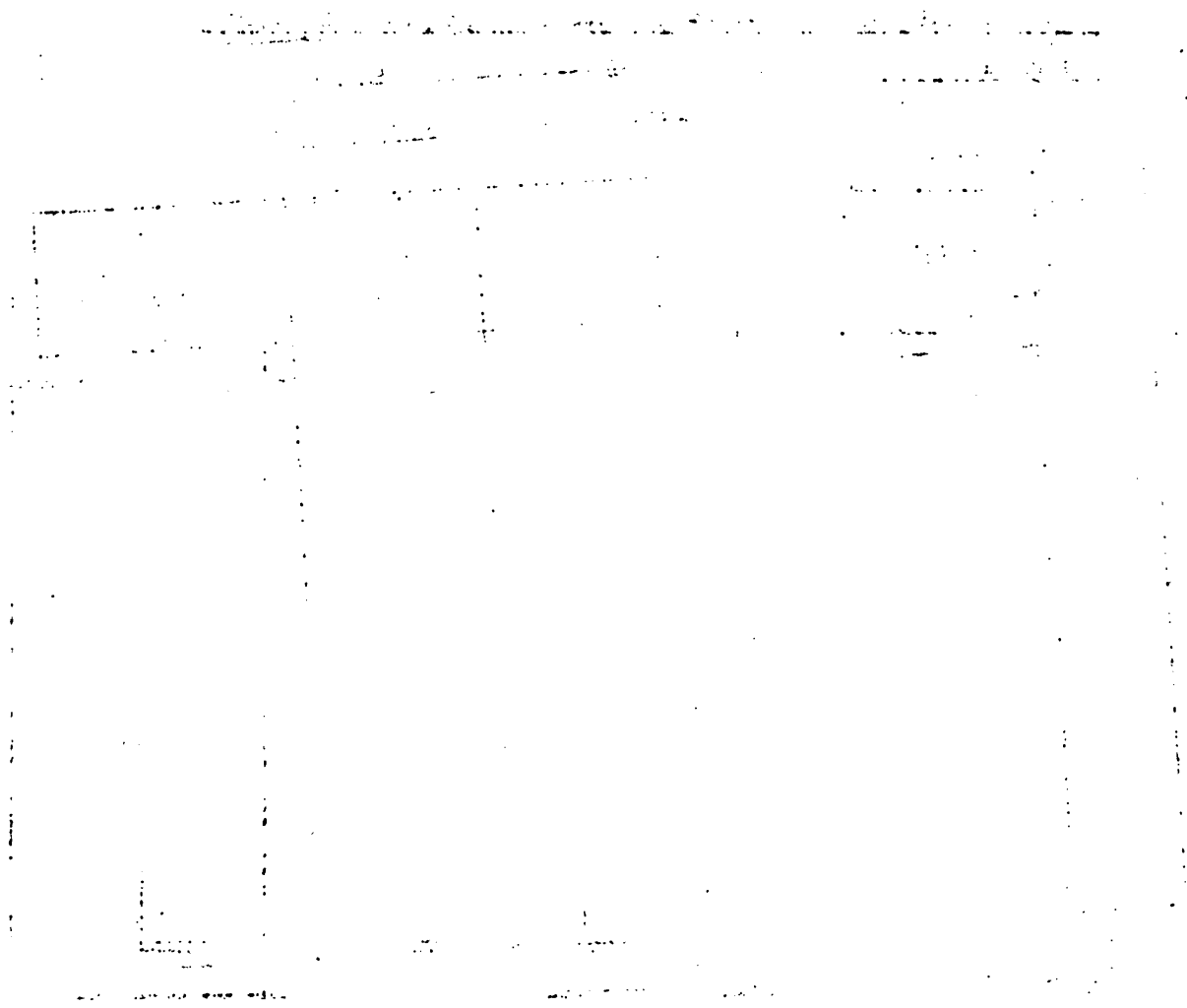


Table 4. Sources of seed purchased by the Seed Processing Unit.

Source	Year			
	1974	1975	1976	1977
Ministry of Agriculture				
Ebini Station	-	19247	10848	1584
Other Station	4262	11203	13631	6154
Farmers (a)	4478 (28+)	26365(1)	13407(1)	2050(1)
State Corporations				
G A P C	-	17164	-	-
GUYSUCO	-	-	-	23119
G R B	-	-	-	60751
G N S	-	338	-	-
	8740	74317	37886	93658

(a) () indicates number of farmers producing seeds.

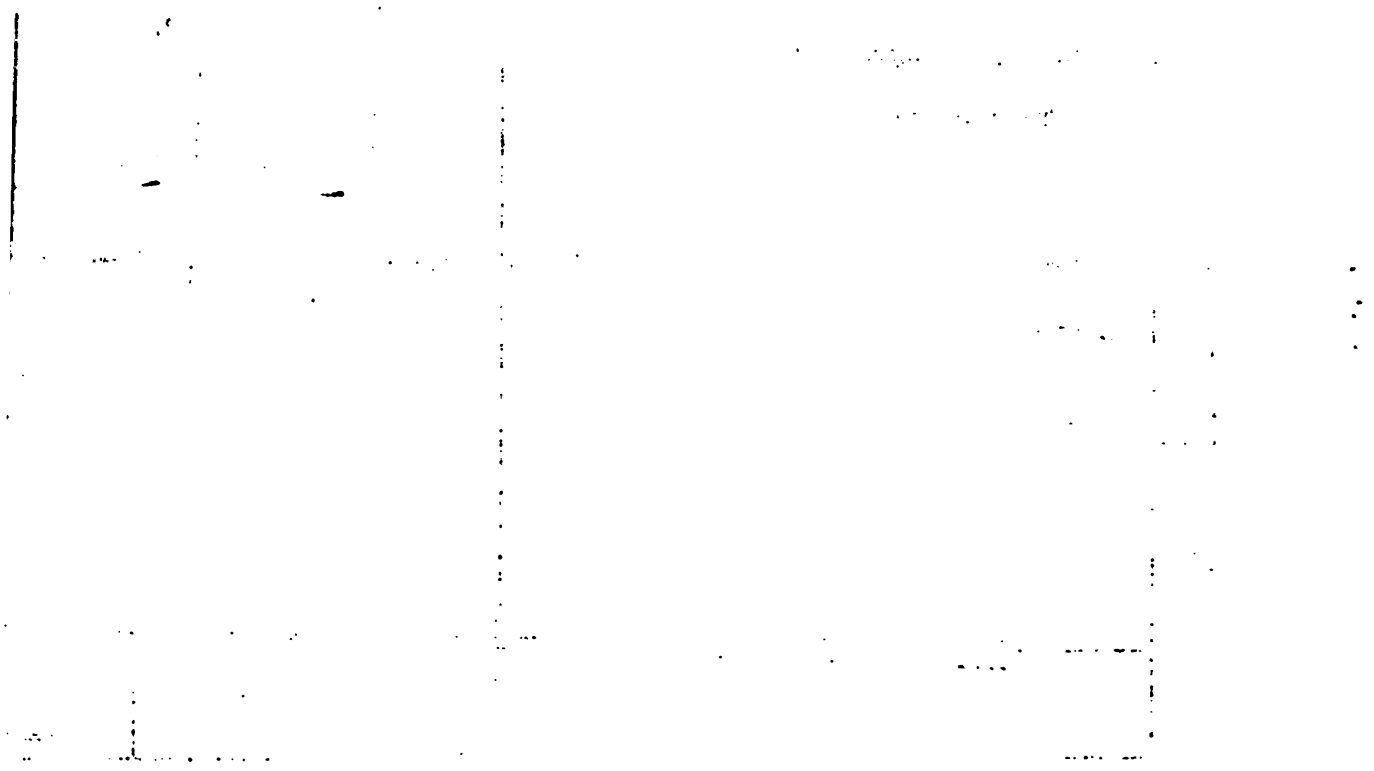
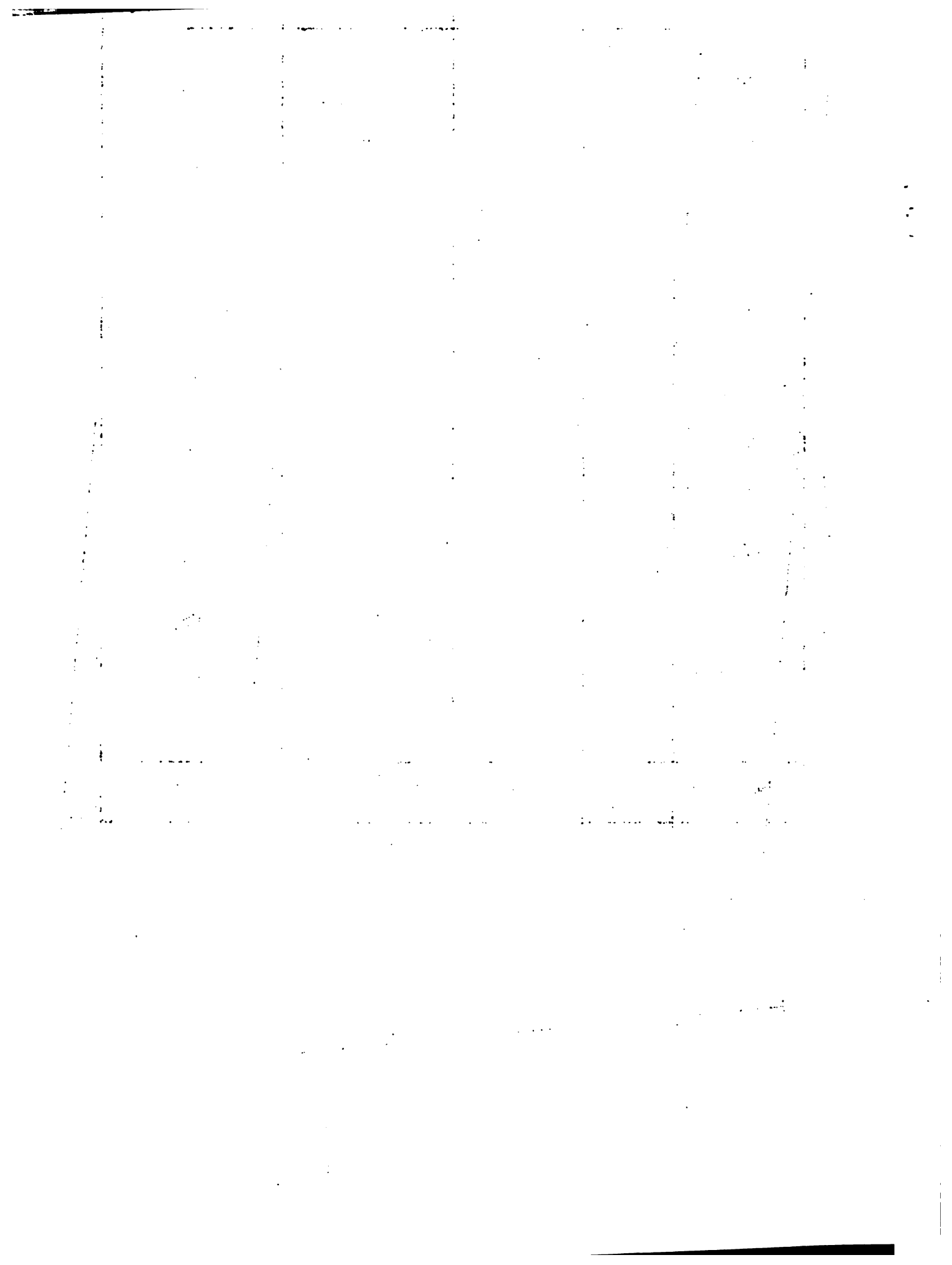


Table 5. Quantities of blackeye pea seed collected monthly by the Seed Technology Unit during 1974 through 1977

	1974	1975	1976	1977
January	-	525	-	3000
February	-	-	-	1100
March	-	4406	748	-
April	2129	39551	470	5688
May	2154	1945	360	24168
June	2067	1472	800	7500
July	-	-	-	4200
August	-	-	1187	20219
September	360	17164	2100	2900
October	2030	1674	24455	8050
November	-	7580	7766	9900
December	-	-	-	6933
TOTAL	8740	74317	37886	93658



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Situation Study on legume production in Guyana. R.E. Pierre & P.F. Robinson, June 1978. No.1

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legume seed industry in Guyana. R.E. Pierre & P.F. Robinson, June 1978. No.2**

1. The first part of the document discusses the importance of maintaining accurate records of all transactions. It emphasizes that this is crucial for the company's financial health and for providing reliable information to stakeholders.

2. The second part of the document outlines the specific procedures for recording transactions. It details the steps from initial entry to final review and approval, ensuring that all entries are properly documented and verified.

3. The third part of the document addresses the role of the accounting department in this process. It highlights the need for clear communication and collaboration between different departments to ensure that all transactions are accurately recorded and reported.

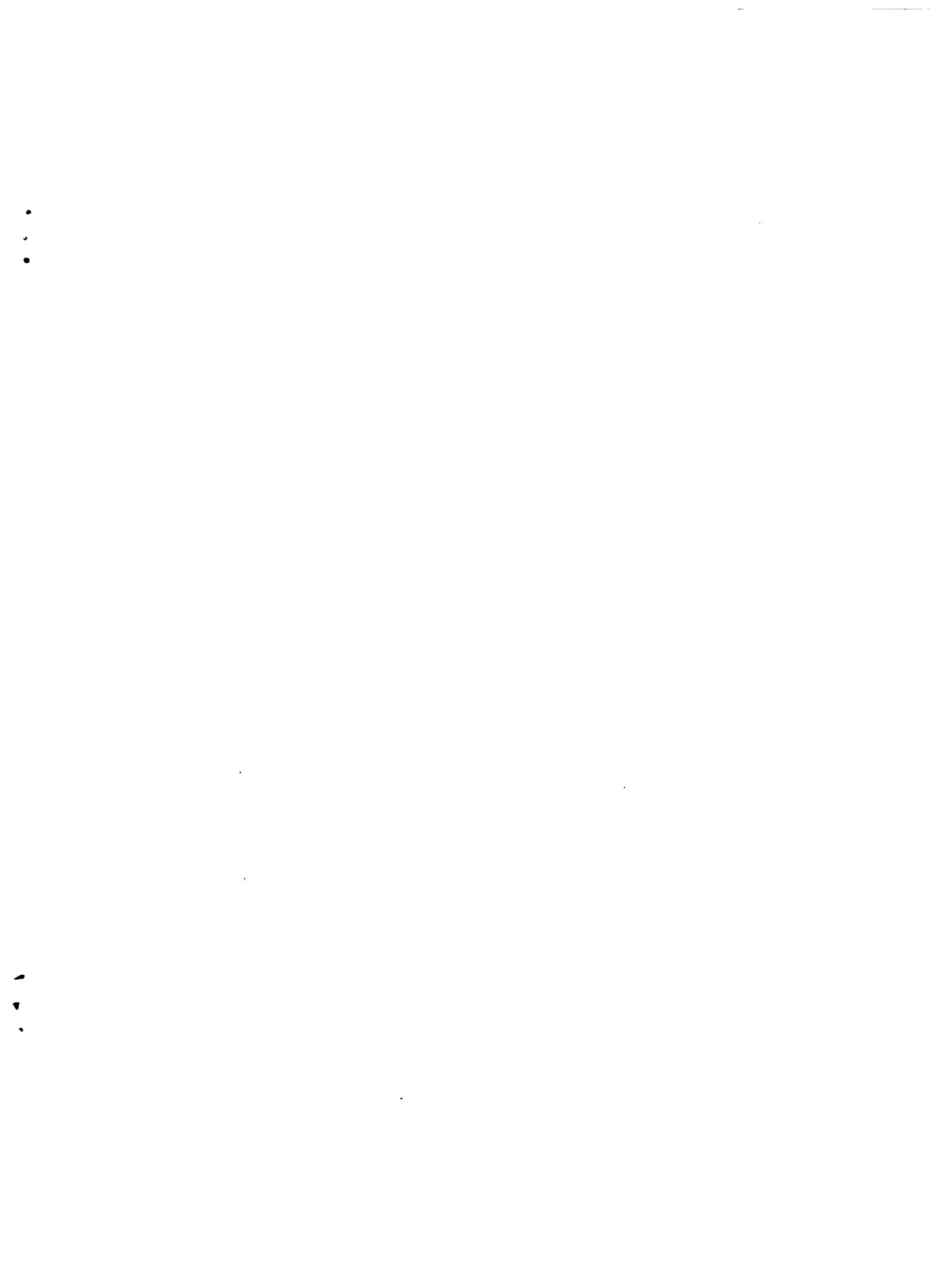
4. The fourth part of the document discusses the importance of regular audits and reviews. It explains how these processes help to identify any discrepancies or errors in the records and ensure that the company's financial statements are accurate and reliable.

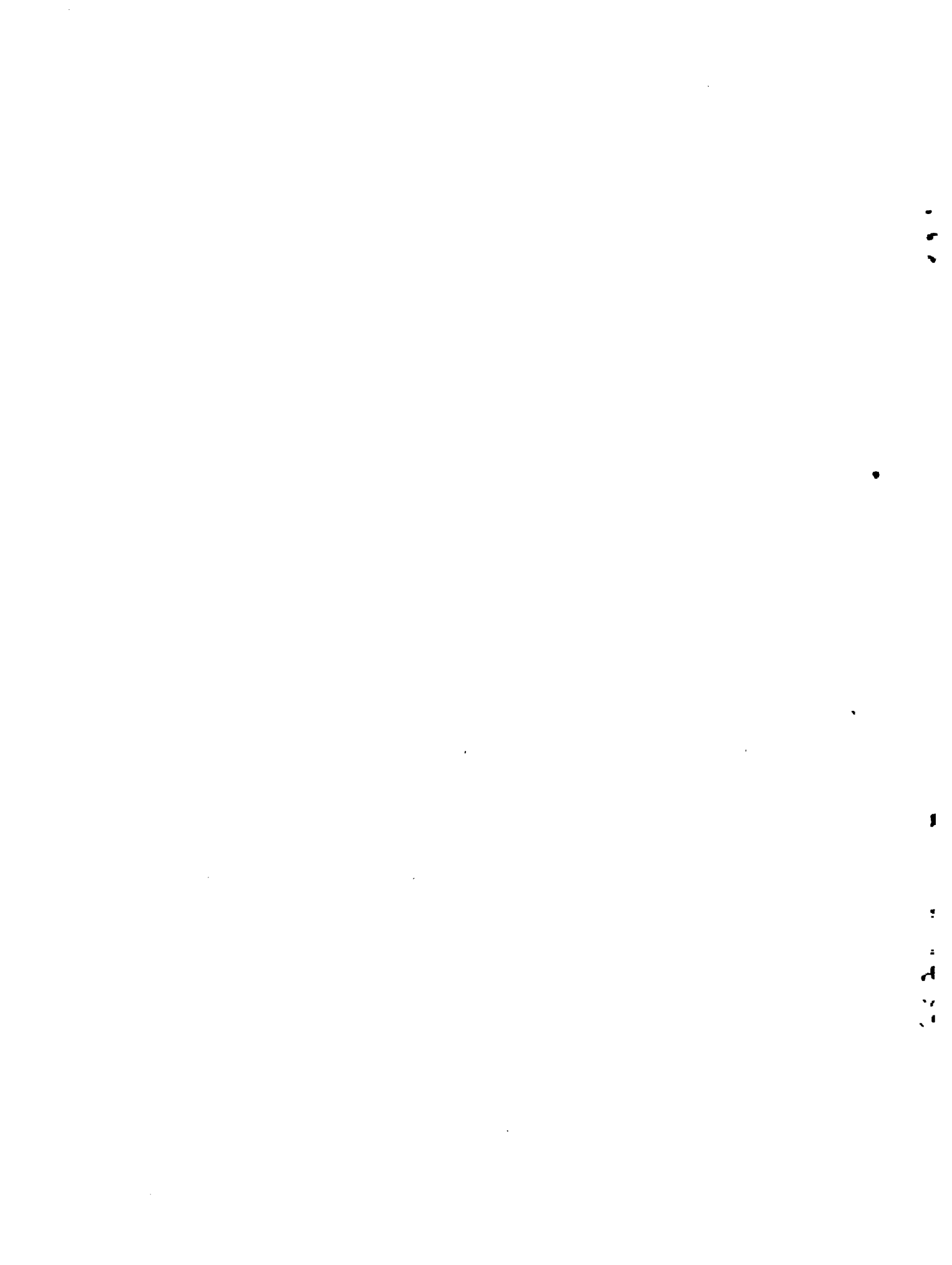
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