CARIBBEAN AGRICULTURAL RESEARCH
AND DEVELOPMENT INSTITUTE

REPORT ON MECHANISATION OF SMALL PEANUT FARMS IN THE EASTERN CARIBBEAN

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PREFACE

This study is part of the "Small Farm multiple cropping Systems Research". Project 538 - 0015 which the Caribbean Agricultural Research and Development Institute (CARDI) is conducting under contract from the United States agency for International Development (U.S. AID). The studies presented in this report were performed under subcontract from CARDI.

The writer wishes to acknowledge the cooperation and assistance of Dr. S. Parasram and Dr. S. Haque of the staff of CARDI in Trinidad and to staff of the same institution in the Caribbean territories of St. Vincent, Antigua, Barbuda, St. Kitts and Nevis. The assistance of many persons in the various Ministries of Agriculture and the agricultural sector in each territory is also gratefully acknowledged.

BACKGROUND TO STUDY

The lesser developed countries of the Caribbean are characterised by small farms and small holders principally engaged in farming crops by manual methods.

Many of the crops grown and procedures followed maintain the farmer at little more than subsistence level.

Peanuts is one of the crops grown in these territories which has the potential to raise standards of living. Within the region, demand exists for considerably more peanuts than are grown at present. In fact, regional import figures in 1974 approached 13 million lbs while the corresponding production was only 3 million lbs.

The traditional method of growing peanuts is by manual methods which, in a family type holding, immediately places a limit on the area which can be cropped. This area constraint becomes evident when the labour input for harvesting is taken into account.

It is in such a context that recommendations are made herein to ease the labour burden of the small farmer engaged in peanut production. Mechanisation for him can take the form of access to a government or other institutional mechinery pool, cooperative ownership of equipment, reliance on contractor services or his private ownership of the equipment.

Bearing in mind the small size of many West Indian farms, the multifarm use of machinery seems more practical and economic as this allows the employment of conventional 4 wheeled farm tractors. Such units can accommodate a variety of soil and surface conditions. Ownership of a tractor and associated attachments on a small holding of 5 acres or less is possible only when such a unit is inexpensive and within the economics of the farm's production. This would seem to point towards smaller walking tractors to fulfil the mechanisation role for such small farmers, larger more conventional 4 wheeled units being ruled out on the basis of cost.

This report is therefore intended as an initial component of a technology development system for the lesser developed countries of the Caricom region. Special emphasis is placed on the mechanisation of peanuts but the approach is valid for other crops. The specific territories to which this report is applicable are St. Vincent, Antigua, Barbuda, St. Kitts and Nevis.

A second report will follow on an information gathering system for peanut production which, while having more direct bearing on St. Kitts, will have application in all the islands.

Recommendations have been framed around the concept in each territory of mechanising the operations of approximately ten farmers on holdings of sizes 1 to 5 acres.

Equipment recommended, operating under the control of CARDI personnel would create a demonstration effect for other farmers not included in the projects in each territory.

It should be stressed however that mechanisation is only one factor. In developing a production package for small farms, a system approach is vital for success. Seeds, fertilizers, management, marketing and credit as well as the mechanisation input are all key components in forming the basis of a system for successful agricultural production.

Consequent on the above, this study was undertaken with the following objective as defined in the contract document: - to identify equipment which could be used in the technological package for the less developed countries where there is small scale production of peanuts.

GENERAL FEATURES OF THE TERRITORIES VISITED

The Caribbean Territories visited showed general characteristics of small territory size, generally poor engineering and support services for machinery, high fuel prices, poor government and/or contractor machinery and hire services, shortage of foreign exchange and capital, small farm size and farmer acceptance of, but general unfamilarity with, machinery.

Specific information on each territory except St. Kitts is included in the Peanut Mechanisation information forms in the Appendix to this report but some general comments are made below.

ST. VINCENT : The territory visit to St. Vincent identified the Argyle area as the probable site for the peanut project in that territory. The island has a low tractor population and dealer spare parts or organised servicing or repair facilities are absent. Spares are imported from the neighbouring islands of Barbados and Trinidad. Local mechanics are available to provide tractor repairs. The soil type in the area is a light easily worked, sandy loam with virtually no stones or rocks. This soil is suitable for the use of light walking type tractors. Peanuts are already grown in the area.

There is a rudimentary tractor service for farms which has insufficient equipment to make much impact. CARDATS* also has a tractor in operation in the area for farmers in their scheme. CARDI has two Gravely walking tractors which have been used with some success in land preparation for peanuts. Contour planting and terracing are evident on some portions of the project area. The topography is gently sloping with good drainage. Fuel prices are Gasolene $4.85 EC and Diesel Fuel $4.16 EC per gallon. Farm sizes are small with the predominant size in the project 4 to 5 acres. The writer was advised that it was possible to group approximately 10 farmers in the area who would be interested in involvement in the peanut production project.

*Caribbean Agricultural Rural Development Advisory Training Services.

ANTIGUA : A number of possible project areas were visited in Antigua. Of these the most likely areas for introduction of a peanut production project were the Cades Bay and Table Hill - Gordon areas. Antigua has a larger tractor population (over 250 units) than the other territories visited and there is a dealer representing a well known brand of agricultural machinery.

Soils seen in the prospective project areas were generally clay loams which in some areas showed evidence of stones at the soil surface. Machinery can be used with adequate care and precautions being taken against stone damage. Peanuts were not seen on any of the areas visited although the writer was informed that peanuts had been grown on some areas before.

Government has no organised tractor pool service for farmers. Some contract hire of units for ploughing and other operations takes place.

Antigua has lower annual rainfall than St. Vincent (40" approximately) and the topography viewed was flat to gently sloping with no drainage problems.

Fuel prices were - Gasolene $4.77 EC and Diesel Fuel $4.25 EC per gallon. Farm sizes vary between 1 and 5 acres. Discussions with CARDI staff in Antigua indicated that the prospective farmers to be involved in a peanut production scheme might be dispersed over more than one location necessitating transport of project equipment.

BARBUDA : Two areas in Barbuda were visited for possible peanut production activity, the Highlands and Sand Ground areas. The island is characterized by low agricultural machinery population and the absence of the associated engineering support services. Fuel must be transported in drums from Antigua and costs with the additional transport approximately $5.00 EC for gasolene and $4.80 for diesel fuel per gallon. Some mechanics are available for equipment repairs.

BARBUDA
(Con't) : The government operates two agricultural tractors on the island but these appear to be occupied in transport and haulage predominantly.

The soil types are clay loams in general in the Highlands area and similar soils with sand pockets in the lower Sand Ground area. Some of the soils exhibit a very stony appearance and hand removal and piling of stones is evident in cultivated areas. Coral outcrops can be seen in some locations.

Peanuts are not extensively grown but some cultivation does exist. The crop is planted on the flat. Rainfall is low (30" - 35") and drainage is not a problem. Conservation of water would play an important part in agricultural operations. Farm sizes are small (1 to 1.5 acres reported) and all lands are vested in the Barbuda Island Council with individual farmers having rights to their cultivation.

NEVIS : The visit to Nevis identified a possible project area in the Newcastle - Round Hill region. Visits were also made to the Prospect, Hermitage and New River areas where peanuts could also be grown. Nevis has a small population of agricultural machinery but there is a government tractor pool in operation which is utilized by the farmers.

Soil types are generally loams with varying amounts of stoniness. Fuel prices are high $4.95 for gasolene and $4.50 for diesel fuel. There are no agricultural machinery distributors on the island and consequently an absence of support services for equipment. Some private mechanics are available for machine repair and the government has repair services through the Public Works Department. Peanuts are grown in some areas and holdings are small and fragmented (1 to 5 acres). Some lands are rented from the government for farming.

FACTORS AFFECTING A MECHANISED SYSTEM IN THE TERRITORIES

A number of factors would affect the planning, operation and profitability of a mechanised system in the Caricom territories visited. These might include:-

1. Pricing of the Agricultural Output

   Domestic markets are often poorly organised with low producer prices. Export pricing is frequently unpredictable.

2. Communications

   Roads in farming areas are often sparse and low grade but this is offset by the small size of the islands and relative proximity to town centres. Inter-island communication for export is frequently irregular.

3. Spares Availability

   This is generally poor. There are long delays in getting spare parts and prices are high. Foreign exchange problems may affec availability of spares.

4. Agricultural Input

   Supplies of other agricultural inputs, e.g. fertilizer, chemica etc. are often unreliable and cost is high.

5. Labour

   Moderately skilled and educated labour is usually available but there is a serious shortage of skilled and experienced agricultural, engineering and technical staff.

6. Management

   A serious shortage of experienced managers exists. Planning da is also usually sparse.

7. Extension Services

   These are present and may be well organised but depend on oral communication heavily, with little written or broadcast inform

8. Credit

   The credit worthiness of small farmers is frequently a problem. Private capital is scarce. Low cost government credit schemes are frequently the sole avenue for the small farmer to acquire equipment. Such schemes are limited by scarcity of funds.

9. Land

The less developed land areas frequently require considerable investment of capital and/or labour to make them suitable for mechanised operations. Removal of stones, contouring, fencing, etc. are costly operations.

GENERAL OPERATIONS IN GROWING PEANUTS

Basic information on climate, soil conditions, water relations, etc. necessary for the growing of the crop and applicable to the region is contained in CARDI's "Draft Techpack for Peanut Production." With regard to the mechanisation input the following areas assume importance.

1. Land Preparation

Land preparation should be geared towards a fine textured good tilth preferably 9" deep and with complete destruction of weeds. This can be achieved by an initial ploughing followed by secondary cultivation operations of harrowing or rotavating to obtain the desired tilth.

The initial ploughing operations would exert the heaviest demand on the machine with reference to drawbar horse-power. Smaller tractive units, e.g. walking tractors, etc. would have difficulty on many soils in realising this depth of cultivation.

In some areas (St. Vincent) there is an additional operation of banking or ridging which assists in preventing soil loss in sloping topography situations and is the traditional method of growing peanuts.

2. Planting

For the small scale farmer this is best done by hand or with simple semi-mechanized planting equipment. Conventional planters or drills are more suited for larger scale operations and are in use on the National Agricultural Corporation farmlands in St. Kitts.

3. Cultivation and Weed Control

The CARDI Techpack emphasises the importance of mechanical weed control in small farm situations because of escalating cost, foreign exchange, importation requirements for chemicals and equipment and operational hazards and dangers. In this context hand control of weeding or machine inter-cultivation assumes importance. Activities should therefore concentrate on excellent initial land preperation, killing all weeds and then possible inter-row cultivation about 15 days after sowing with an appropriate inter-cultivation tool.

4. Fertiliser and Lime Application

This, in small scale peanut production, would best be done by hand, broadcast and mixed before sowing. If equipment is available for multifarm usage then this operation could be mechanized.

5. Pest and Disease Control

Manual spraying or dusting, would be usual in the small farm situation.

6. Irrigation

None of the areas viewed were irrigated and the possiblity of irrigation appeared to be remote.

7. Harvesting

This is presently being done on small farms by hand. It is possible for lifting equipment to be developed for use with small walking tractors to assist in this labour consuming part of the growing of peanuts. Digging equipment is also commercially available for use with small tractors and should be tested on the Projects.

8. Drying

In the small farm situation sun drying is the method used. Current interest in the region in solar drying and equipment for this process opens up the possibility of this type of unit being made available for possible multifarm use in the future.

THE MECHANISED SYSTEM

The machines selected must operate under certain constraints which are listed below:-

1. The operating surfaces are often sloping.

2. The operating surface may be rough and with varying amounts of stones.

3. Space for manoeuvre is often very limited because of small farm size and layout, therefore small turning circles are necessary.

4. Operation in growing crops demands high clearance, or narrow operating width.

5. Low cost operation is essential in the light of the economics of small scale production.

In this context the equipment selected must perform the following agricultural tasks:-

1. The application of full engine power in the form of high drawbar pull at low speeds.

2. The provision of power, mobile support and control for a variety of attachments capable of performing a number of operations.

The selected equipment should therefore ideally possess the following characteristics in the light of the above factors and the particular characteristics of the territories.

1. Simple construction.

2. Safe and simple operation and maintenance.

3. Reasonably rugged construction and reliable performance.

4. Improved performance relative to manual methods or animal power.

5. Low initial cost within the cash or credit reach of the small farmer.

6. Service and spares availability in the region.

7. Low operating cost with particular reference to low fuel cost per acre.

8. Range of attachments available for use with the selected power unit.

9. Ability to cover 30 to 40 acres of cultivation during a normal growing season.

10. Ability to operate on slopes and in confined spaces.

11. Ability to perform intercultivation work.

OPERATIONS TO BE MECHANISED

- Ploughing/Harrowing
- Rotavating
- Intercultivation
- Banking/Ridging
- Lifting or Digging

TYPE OF POWER UNIT

Mechanisation of the project can be accomplished using either four wheeled tractors or two wheeled walking tractors.

Disadvantages of conventional four wheeled tractors in the context of the peanut production project are:-

1. Small farm size - 1 to 3 acres could not justify this size unit.
2. Small field size - units and low turning time and space becomes preponderant, four wheel units are at a disadvantage.
3. Price - more expensive than two wheeled units.
4. Crop space characteristics. Inter-row space may be restricted.
5. Terraced and sloping lands may restrict their operation.

On the benefit side the more conventional four wheeled tractors are more cost efficient than two wheeled units, have greater machine population in the territories and as a result enjoy better spares and service facilities. On widely dispersed farms, the four wheeled unit would also be able to move between separate farms under its own power without the necessity for interfarm transport. In addition, such a unit would function better with its stronger implements and attachments on soils where stony conditions are a problem.

In view of the overwhelming importance of the cost factor in small scale farming, conventional four wheeled tractors have not been considered in making comparisons and recommendations in this report.

SELECTION OF EQUIPMENT

After visiting the various territories, the writer would like to put forward the concept that the initial land preparation could be performed by a higher horsepower four wheeled unit in order to get faster work and better depth of cultivation. All follow up operations could then be done by the individual farmer with a lighter two wheeled tractive unit.

The evolution of a system where a government or institutional tractor pool or farmer's cooperative or group, would do initial cultivation and the following activities would be performed by the individual seems therefore desirable in the light of farm size and the cost of today's machinery. This does not of course rule out initial ploughing and land preparation by the individual farmer where his conditions permit.

A number of manufacturers in various countries fabricate two wheeled farm tractors. In framing recommendations the power units considered were those represented or marketed in the region in either the territories where they would be used or in adjacent territories. The rationale behind such an approach being that such units should have a better chance of spares and service support than unrepresented units.

On the above basis, tractor units to be considered were limited to:-

Gravely

Howard

Agria

Wolseley (2 models)

TECHNICAL RECOMMENDATIONS

Comparisons were made on the basis of the ideal characteristics of a two wheeled tractor for particular application in the territories.

These desirable characteristics were:

4 Stroke Diesel Engine	–	Higher initial cost than gasolene but lower maintenance and fuel cost and longer life. 4 stroke engine preferred over 2 stroke.
8 H. P. desirable	–	UNIDO (1972) recommendations for H. P. requirements for farming in developing countries are 0.4 K.W. per hectare. (approx. 0.2 H. P. per acre). The requirement based on covering up to 40 acres per cultivation season is therefore 8 H. P.
Gear Type Transmission	–	Allows better range of speeds to be selected. 4 forward speeds are desirable for a range of conditions.
Separate P. T. O. Shaft	–	Desirable for powering stationary and other equipment. More than one P. T. O. speed is desirable.
Large diameter wheels	–	Larger wheels preferred (16" diameter minimum) for negotiating uneven terrain.
Strong Construction	–	Robust construction and a minimum weight of 400 lbs.
Good range of attachments	–	Desirable to have the following attachments available for the unit. Plough, Rotavator, Harrow, Furrower or Digger, Ridger, Cultivator
Regional support services	–	Regional support services are very important; sales, parts, service availablity in the territory or an adjoining territory are essent
Low Price	–	Unit must be priced to suit the small farmer. A 1980 pricing under TT $5,000 for the basic unit is desirable.

RATING OF UNITS

A points system was developed for comparison of units based on a perfect score of 100 for eleven (11) desirable equipment characteristics. This marking system is detailed below and as seen, heavier weightings have been given to Horse Power, support service availability, attachment availability and pricing.

1.	Engine Type	5
2.	Horse Power	10
3.	Transmission Type	5
4.	Forward Speeds	5
5.	P. T. O. Characteristics	5
6.	Starter Type	5
7.	Wheel diameter	5
8.	Construction	10
9.	Attachments	15
10.	Support Services	15
11.	Price	20
	TOTAL	100

Scale of Points for Rating

1. Engine Type : Diesel 4 stroke - 5
   Gasolene 4 stroke - 3

2. Horse Power : 8 to 10 H.P. - 10
   6 to 7 H.P. - 6
   3 to 5 H.P. - 2

3. Transmission : Gear Type - 5
   Belt/Gear Type - 3
   Belt Type - 2

4. Forward Speeds : 4F - 5
   3F - 3
   2F - 2

5. P.T.O. : Separate 2 speed P.T.O. - 5
   Single 2 speed P.T.O. - 3
   Single 1 speed P.T.O. - 1

6. Starter : Electric - 5
   Pull type - 3

7. Wheels : 16" or larger - 5
   Less than 16" - 3

8. Construction : Robust - 10
   Moderately Robust - 6
   Light - 2

9. Attachments : Plough - 2
   Rotavator - 2
   Harrow - 2
   Ridger - 2
   Cultivator - 2
   Furrower/Digger - 2
   Other Miscellaneous attachments - 3

10. Support Services : Regional representation in:-
   - Sales - 5
   Parts - 5
   Service - 5

11. Price : TT$2,500 to $3,500 = 20
   TT$3,501 to $5,000 = 15
   TT$5,001 to $6,000 = 10

The application of this rating scale to the compared units is shown in Table 1 and abbreviated specifications of these units are listed in Table 2.

TABLE 1

Points Rating For Two Wheeled Tractors

MAKE AND MODEL

Characteristic	Gravely 8245	Wolseley Titan	Wolseley Titan G.T.	Howard Dragon	Agria 7000
Country of Manufacture	U.S.A.	U.K.	U.K.	U.K.	Spain
Regional Representative	Trinidad/ Barbados	Trinidad	Trinidad	Trinidad/ Barbados	Trinidad
Engine Type	3	3	3	3	5
Horse Power	10	2	6	10	10
Transmission Type	5	2	5	3	5
Forward Speeds	5	2	5	2	2
P.T.O. Characteristics	3	1	1	5	5
Starter	3	3	3	3	3
Wheel Size	5	5	5	5	3
Construction	10	2	10	10	6
Attachments	13	11	11	9	9
Support Services	15	15	15	15	5
Price	15	20	20	15	15
TOTAL POINTS RATING	87	66	84	80	68

TABLE 2

ABBREVIATED SPECIFICATIONS FOR 2 WHEELED TRACTORS

	Gravely 5245	Wolseley Titan	Wolseley Titan G.T.	Howard Dragon	Agria 7000
Engine	Gasolene 4 Stroke	Gasolene 4 Stroke	Gasolene 4 Stroke	Gasolene 4 Stroke	Diesel 4 Stroke
Horse Power	8	5	7	8	8
Starter	Pull type	Pull type	Pull type	Pull type	Pull type
Transmission	Gear	Belt	Gear	Belt/Gear	Gear
Speeds	4F 4R	2F 1R	4F 1R	2F 1R	2F 1R
P. T. O.	Single 2 speed	Single P. T. O.	Single P. T. O.	2 P. T. O. Shafts	2 Direct and throug Gears
Wheels/Tyres	18 x 650	16" diam.	16" diam.	5.00 x 8 or 16.00 x 6.50	4.00 x 8
Construction	Robust	Light	Robust	Robust	Moderately Robust
*Attachments	P,R,F,C, B,M	P,R,F,C, M	P,R,F,C, M	P,R,F,M,	P,R,B,M
Support Services	Sales Parts Service	Sales Parts Service	Sales Parts Service	Sales Parts Service	Sales
Estimated Price $TT.	$4,525	$2,336	$3,100	$4,830	$4,000

*Attachments Plough - P Rotavator - R Furrower - F Cultivator - C
Ridger/Banker - B Harrow - H
Miscellaneous attachments - M.

CONCLUSIONS AND RECOMMENDATIONS

1. CARDI should, where possible, arrange for initial cultivation to be performed by larger 4 wheeled units while following operations e.g. refining, ridging, intercultivation, digging or lifting could be done by two wheeled units. This is specifically applicable in projects where there is a stony soil surface.

2. The most acceptable two wheeled unit is the Gravely 5245 unit closely followed by the Wolseley Titan G.T. and the Howard Dragon.

3. The attachments* which should be initially purchased for test include:-

   Plough

   Rotavator

   Ridger

   Tined Cultivator

   Digger

4. CARDI should attempt to purchase for harvesting a small manufactured peanut digger specially designed for use with animal power or small two wheel tractors. One such attachment is marketed by Central Commercial Co. (CeCoCo) P. O. Box 8, Ibaraki, Osaka - Fu, Japan. This implement requires 3 to 5 H. P. and could be easily tested in the verious territories.

5. In the light of the absence of mechanical support services in a majority of the territories included in this study, CARDI staff will have to monitor closely, application and maintenance of project machinery.

* Selected estimated attachment prices are shown in Appendix 2.

APPENDIX 1.

PEANUT MECHANIZATION INFORMATION

A. GENERAL.

(1) Territory: ST. VINCENT (2) Date: 18th July, 1980.

(3) Region/County: South East/ Parish St. George (4) Location: Argyle

(5) Nearest Town, Urban Centre: Arnos Vale (6) Distance to (5): 6 miles

(7) Predominant Farm Size: 4 to 5 acres (8) Predominant Crops: Peanuts

(9) Familiarity With Machinery: Tractor Pool in operation, CARDATS tractor in area. Corn interplanted, occasional Sweet Potato.

(10) Farmer Attitude to Mechanisation: Would use machinery services. Land preparation and harvesting assistance welcome.

(11) Machinery Presently in Use:- - Tractor Powered Dependant on availability

Animal Powered None

Hand Tools Yes

(11A) Comments: Farmer would accept use of machinery as Tractor Pool and contractor service have operated in the area.

(12) Maintenance of Existing Machinery: Not applicable CARDATS only

(13) Nearest Fuel Source: Arnos Vale possibly Calliaqua

(14) Price of Fuel: Gasolene $4.85 Diesel fuel - $4.16

(15) Availability of Repair Service in Area: Arnos Vale area has repair services

(16) Facilities for Storage of Equipment : Arrangements with farmers possible.

(17) Comments: Crop rotation in use - peanuts followed by sweet potato or peanuts followed by peanuts.

PEANUT MECHANIZATION INFORMATION

B. AREA CONSIDERATIONS

(1) Topography: sloping lands (2) Predominant Slope: 5%-20 %

(3) Elevation: 500 Ft. to Sea Level (4) Climate/Weather: Marked Dry Season December to April

(5) Annual Rainfall: 75 inches to 85 inches

(6) Tenacing/Soil Conservation: Contour planting, some terracing evident

(7) Drainage Considerations: Rolling lands, good drainage, no excess water problems.

(8) Irrigation Considerations: Would require water storage and pumping not considered at present.

(9) Soil Type: Low level yellow earth. (Light easily worked sandy loam.)

(10) Presence of Stones/Rocks: Virtually nil

(11) Presence of Stumps and other Debris: minimum to nil

(12) Soil : - Well Worked [x]

- New Cultivation [ ]

(13) Cultivation Method: - Flat [ ]

- Ridge [x] Traditional method across the slope

- Bank [ ]

- Other [ ]

(14) Comments : Topography and water relations allow for mechanisation on most of the area. Soil easily worked. Tractor cultivation by CARDATS - (MF 235) and CARDI - (Gravely walking tractors). Majority of land hand worked.

PEANUT MECHANIZATION INFORMATION

C. SUPPORT SERVICES AVAILABLE

(1) Machinery and Equipment represented in Territory:-

	Distributors	Make	Sales	Parts	Service
(a)	*Hadley Brothers	Ford and Massy Ferguson	x		
(b)					
(c)					
(d)					
(e)					
(f)					

*Now reported no longer in the business

(2) Machinery and Equipment represented by dealers outside of Territory:-

		Distributors	Make	Sales	Parts	Service
Barbados	(a)	Plantrac Industries	MF, Howard	x	x	x
Barbados	(b)	Central Foundry	Gravely	x	x	-
	(c)					
	(d)					

(3) Government or Contractor Service available: Government funding scheme, insufficient for the farmer demand.

(4) Comments on general support services for Machinery: Typically no organised distributor services for agricultural equipment, Barbados, and Trinidad firms are used for spares support.

(5) General Comments on Territory: Total territory tractor population members 15 Approximately.

Private Mechanics available and in great demand. These will repair machines if spares are supplied to them.

PEANUT MECHANIZATION INFORMATION

A. GENERAL.

(1) Territory: ANTIGUA (2) Date: 19th August, 1980.

(3) Region/County: Cades Bay & Table Hill Gordon (4) Location: as at (3)

(5) Nearest Town, Urban Centre: St. Johns (6) Distance to (5): 10 - 12 miles

(7) Predominant Farm Size: 1 - 5 acres (8) Predominant Crops: Ochroes, vegetable, Food crops in both areas

(9) Familiarity With Machinery: Fairly familiar with agricultural equipment

(10) Farmer Attitude to Mechanisation: Mechanisation accepted by farmers. Tractors not easily available for primary cultivation.

(11) Machinery Presently in Use:- - Tractor Powered Dependent on availability

Animal Powered Nil

Hand Tools Yes

(11A) Comments: No definite area for project demarcated or any farmers approached, likely areas are Cades Bay area (Ravens Croft), and Table Hill Gordon area.

(12) Maintenance of Existing Machinery: Fairly well maintained

(13) Nearest Fuel Source: St. Johns

(14) Price of Fuel: Gasolene $4.77 Diesel Fuel $4.35

(15) Availability of Repair Service in Area: Repairs available,

(16) Facilities for Storage of Equipment : adequate, equipment can also be transported.

(17) Comments: Peanuts not seen on any of the areas visited, although information given was that this crop had been grown before in the prospective locations.

PEANUT MECHANIZATION INFORMATION

B. AREA CONSIDERATIONS

(1) Topography: Flat to gently sloping (2) Predominant Slope: 0 - 5 %

(3) Elevation: 100 - 200 ft. (4) Climate/Weathor: Dry moderate

(5) Annual Rainfall: 40 inches

(6) Tenacing/Soil Conservation: not applicable

(7) Drainage Considerations: Good drainage. No excess water problem.

(8) Irrigation Considerations: No irrigation possible on areas which were visited.

(9) Soil Type: Clay Loam series with presence of stones in some areas

(10) Presence of Stones/Rocks: Some stones present at surface level

(11) Presence of Stumps and other Debris: Lands are generally clean.

(12) Soil : - Well Worked [x]

- New Cultivation [ ]

(13) Cultivation Method: - Flat [ ]

- Ridge [x]

- Bank [ ]

- Other [ ]

(14) Comments : All areas viewed of generally similar soil and slope characteristics. Machinery can be used with adequate care taken against stone damage.

PEANUT MECHANIZATION INFORMATION

C. SUPPORT SERVICES AVAILABLE

(1) Machinery and Equipment represented in Territory:-

	Distributors	Make	Sales	Parts	Service
(a)	Stephen Mendes	Massy Ferguson	x	x	x (contracted)
(b)					
(c)					
(d)					
(e)					
(f)					

(2) Machinery and Equipment represented by dealers outside of Territory:-

	Distributors	Make	Sales	Parts	Service
Barbados (a)	Plantrac	MF, Howard	x	x	x
(b)					
(c)					
(d)					

(3) Government or Contractor Service available: Government Tractor service available insufficient units for the demand.

(4) Comments on general support services for Machinery: Repairs by private mechanics and some machinery distributor services abailable.

(5) General Comments on Territory: Better machinery support services than many of neighbouring islands.

PEANUT MECHANIZATION INFORMATION

A. GENERAL.

(1) Territory: BARBUDA (2) Date: 18th August, 1980.

(3) Region/County: N/A (4) Location:

(5) Nearest Town, Urban Centre: Codrington (6) Distance to (5):

(7) Predominant Farm Size: 1 - 1.5 acres (8) Predominant Crops: Root crops, Pulses, some peanuts, open range live stock husbandry.

(9) Familiarity With Machinery: Little mainly hand cultivation

(10) Farmer Attitude to Mechanisation: Would be accepted but conditions for use of mechinery very adverse.

(11) Machinery Presently in Use:- - Tractor Powered Limited
Animal Powered Nil
Hand Tools Predominant

(11A) Comments: Total tractor population 8 units of which 2 are government owned. Project would have to be controlled preferably by institution in view or conditions for machinery.

(12) Maintenance of Existing Machinery: No spare parts depot, difficult maintenance

(13) Nearest Fuel Source: Antigua - fuel would have to be imported (45 gall. dr.

(14) Price of Fuel: $5.00 gasolene $4.80 diesel fuel

(15) Availability of Repair Service in Area: Some mechanics on island

(16) Facilities for Storage of Equipment : Storage by farmers or elsewhere adequate.

(17) Comments: Low machinery population, no organised fuel depot.

PEANUT MECHANIZATION INFORMATION

B. AREA CONSIDERATIONS

(1) Topography: Generally Flat (2) Predominant Slope: 0 - 5 %

(3) Elevation: 0 - 200 ft. (4) Climate/Weather: Dry, Windy

(5) Annual Rainfall: 30 - 35 inches

(6) Tenacing/Soil Conservation: Not required

(7) Drainage Considerations: Nil

(8) Irrigation Considerations: Water generally in short supply

(9) Soil Type: High Lands - Barbuda clay loam, Codrington Clay, Sand Pockets.

(10) Presence of Stones/Rocks: Very stony in areas, coral outcrops present.

(11) Presence of Stumps and other Debris: sometimes

(12) Soil : - Well Worked [x]

- New Cultivation [x]

(13) Cultivation Method: - Flat [x]

- Ridge [ ]

- Bank [ ]

- Other [ ]

(14) Comments : Stony soil surface may pose hazard to machinery in many areas.

PEANUT MECHANIZATION INFORMATION

C. SUPPORT SERVICES AVAILABLE

(1) Machinery and Equipment represented in Territory:-

	Distributors	Make	Sales	Parts	Service
(a)	None				
(b)					
(c)					
(d)					
(e)					
(f)					

(2) Machinery and Equipment represented by dealers outside of Territory:-

	Distributors	Make	Sales	Parts	Service
(a)	Stephen R. Mendes(Antigua)	Massy Ferguson	x !	x	x
(b)					
(c)					
(d)					

(3) Government or Contractor Service available: Two Government Tractors as organised machinery Pool/

(4) Comments on general support services for Machinery: Minimal support services available. Some mechanics on island, who might perform repairs.

(5) General Comments on Territory: Any machinery services would have to be operated by CARDI personnel, and monitored continuously.

PEANUT MECHANIZATION INFORMATION

A. GENERAL.

(1) Territory: NEVIS (2) Date: 30th September, 1980.

(3) Region/County: Newcastle/Round Hill area (4) Location: see (3)

(5) Nearest Town, Urban Centre: Charles town (6) Distance to (5): 7 miles

(7) Predominant Farm Size: 1 - 5 acres (8) Predominant Crops: Cotton, Cassava, Peanuts.

(9) Familiarity With Machinery: Fairly familiar through Machinery Pool

(10) Farmer Attitude to Mechanisation: Machinery accepted.

(11) Machinery Presently in Use:- - Tractor Powered When available

Animal Powered -

Hand Tools Yes

(11A) Comments: Farmers have access to Government operated machinery Pool.

(12) Maintenance of Existing Machinery: Machinery Pool equipment PWD maintained

(13) Nearest Fuel Source: Charlestown

(14) Price of Fuel: $4.95 - gasolene. $4.50 Dieselene

(15) Availability of Repair Service in Area: Private mechanics available

(16) Facilities for Storage of Equipment : Could be arranged

(17) Comments: Maintenance of government equipment could be improved. Private mechanics are available although few in number.

PEANUT MECHANIZATION INFORMATION

B. AREA CONSIDERATIONS

(1) Topography: Flat to gently sloping (2) Predominant Slope: 0 - 5 %

(3) Elevation: 0 - 50 ft. (4) Climate/Weather: Dry

(5) Annual Rainfall: In project area 40inches

(6) Terracing/Soil Conservation: not practiced

(7) Drainage Considerations: no drainage problems

(8) Irrigation Considerations: no water resources available for irrigation

(9) Soil Type: Laurence Loam, Coconut Loam, Loamy Soils generally

(10) Presence of Stones/Rocks: Some but relatively free

(11) Presence of Stumps and other Debris: minimal

(12) Soil : - Well Worked [x]

- New Cultivation [ ]

(13) Cultivation Method: - Flat [x]

- Ridge [x]

- Bank [ ]

- Other [ ]

(14) Comments : Some crops grown on ridges. Possible to grow on flat.

PEANUT MECHANIZATION INFORMATION

C. SUPPORT SERVICES AVAILABLE

(1) Machinery and Equipment represented in Territory:-

	Distributors	Make	Sales	Parts	Service
(a)	None present				
(b)					
(c)					
(d)					
(e)					
(f)					

(2) Machinery and Equipment represented by dealers outside of Territory:-

	Distributors	Make	Sales	Parts	Service
(a)	Antigua	Massy Ferguson	x	x	x
(b)	Barbados	Massy Ferguson	x	x	x
(c)					
(d)					

(3) Government or Contractor Service available: Yes 4 operational Tractors plu equipment.

(4) Comments on general support services for Machinery: Support services fair to poor.

(5) General Comments on Territory: Project could be instituted in Nevis if closely monitored by CARDI staff.

APPENDIX 2.

COMPARATIVE PRICING OF SELECTED ATTACHMENTS

	Gravely 5245	Wolseley Titan G.T.	Howard Dragon
Plough	$1,600	N/A	*$ 500.00
Rotavator	$1,300	$125. per rotor pair	$1,200.00
Ridger	N/A	$138.00	$ 950.00

*Needs ploughing kit cost $550.00

All prices in $TT. $1 U.S. = $2.40 TT