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INFORME TRIMESTRAL DE ATIVIDADES

1 - Nome do Consultor: HARBANS LAL

2 - Período: 16 th oct. to 15 th dec.

3 - Título do Projeto:

Agricultural Mechanization for Semi.Arid Tropics Brazil

4 - Nome da Atividade:

To strengthen semi arid production systems

5 - Tipo de Atividade:

- Pesquisa

- Apoio e Pesquisa

- Treinamento

- Outras , especificar

6 - Local:

Petrolina - PE. - Brazil

7 - Organismos beneficiários - (relação)

CPATSA/EMBRAPA and other agricultural research and extension agencies of the region, such as EMATER and IPA and ICRISAT, Hyderabad, India.

8 - Técnicos colaboradores (relação nome/cargo)

1. Péricles Ferreira Nunes - Co. Project Scientist
2. Manoel Abílio de Queiroz - Collaborating Scientist
3. Geraldo Magela Calegar - Collaborating Scientist
4. Octávio Pessoa Aragão - Collaborating Scientist
5. Luiz Corsino Freire - Collaborating Scientist

9 - Trabalhos realizados (descrição sumária)

Refer Anex I

Agricultural mechanization I

1980

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10 - Resultados concretos obtidos nas instituições assistidas:

Refer Anex II

11 - Metas alcançadas:

- . Fabrication of a multitool carrier with locally available material and expertise
- . preliminary study of present status of mechanization
- . Operational evaluation of a manual planter

12 - Circunstâncias e acontecimentos externos ao IICA que afetam a execução das atividades:

13 - Tempo aproximado que os técnicos dedicaram às atividades:

Dias/homem					
IICA			Outros		
	4	4		4	4

14 - Perspectivas, ambiente de trabalho, interesse das instituições que são consideradas importantes para a marcha das atividades. (Deverão ser incluídas, neste ítem, as sugestões sobre as ações que a Coordenação deverá tomar visando melhorar a eficácia do trabalho do consultor).

15 - Atividades que serão desenvolvidas no próximo trimestre: (relacioná-las e indicar o local de execução)

Refer Anex III

16 - Data de apresentação:

15.12.79

17 - Assinatura do técnico responsável.

Harbans Lal

HARBANS LAL

ANEX I - Item 9 (Trabalhos realizados, descrição sumária)

1. Preliminary study of present status of mechanization in some parts of Northeast Brazil, with special emphasis to the available equipment and extent of its uses.
2. Design and fabrication of a multitool carrier (Brazilian Tropicultor)
3. Training of animals and the operator to work with multitool carrier.
4. Testing of a manual planter.

A multitool carrier is a tool frame mounted on pneumatic tyred wheels with adjustable or fixed wheel track and equipped with a seat for operator. A number of attachments such as mould board plows, cultivators, ridgers, planter and a cart body can be mounted on it for field and transport operation respectively. This concept of machinery has been reported effecient and economical as compared to traditional individual machine system, by various international agencies such as ICRISAT (International Crops Research Intitute for the Semi Arid Tropics) Hyderabad, India and N.I.A.E. (National Institute of Agricultural Engineering) Silsoe, U.K.

Annex. II - Item 10 (Resultados Concretos obtidos nas Instituições Assistidas).

1. The visits to the farmers' fields, agricultural research and extension organizations of Agreste region of Northeast Brazil, revealed that the concept of using animal power for agricultural operations is relatively new in Brazil. In Aquidabã (SE) the farmers have started using animal power and related equipment, only for last two years. While in Garanhuns (PE), animal traction has been popular for over two decades. The set of equipment available are mould board, tined cultivator, spike tooth harrow (wooden and steel) and manual and/or animal drawn planter. Farmers, using animal power, are satisfied with its use and have a desire to improve the efficiency of their power source with better and efficient equipment (details available in my trip report to Agreste region of N.E. Brazil, under preparation).

2. A multitool carrier with a fixed wheel track of 150 cm has been fabricated at a local workshop. The wheeled tool carrier is ideally suited for cultivation on broad bed and furrow system, an improved method of farming, for better soil and water conservation, being developed by ICRISAT (International Crops Research Institute for the Semi Arid Tropics) India, and adopted by CPATSA, Petrolina in its production system research. The working width for the cultural operations such as plowing, ridging, cultivation, planting and inter-row cultivation increases to 150 cm, when this machine along with suitable attachments is used on the broad bed and furrow system. The estimated cost of the machine fabricated locally is Cr\$ 10.000,00 (Ten Thousands cruzeiros) as compared to Cr\$ 16.000,00 (F.F. 1.700, seventeen hundred French ex-factory) of the original Tropiculator being manufactured in France.

The initial experience of working with a local workshop staff was quite encouraging in terms of their ability to understand mechanical instructions and to achieve the required precision to fabricate agricultural machines.

3. Unlike Indian farmers and researchers, Brazilian farmers and researchers have a great task for training animals for agricultural operations. Bullocks available at CPATSA, Petrolina, have not been used for agricultural operations since along. The initial attempt to hitch these animals on the tool carrier revealed that an extensive training is required to make them suitable for agricultural operations. The step wise training as listed below has been started for the animals available at CPATSA.

I - Yoking the animals and making them walk together

II - Hitching the machine (tool carrier) and making them pull on the road without caring for the straightness of the path to be followed.

III - Making animals, to pull the machine (without load) straight in the pre-made furrows.

IV - Gradually increasing the load by attaching soil working tools, till animals are habituated to work with the optimum load, walking straight in the pre-made furrows

V - Repeating steps III and IV on the flat ground to make animals walk straight or on the desired path without prevailing guides (furrows).

4. The planter, technically to be called dribbler, is a manually operated to plant variety of crops such maize, cowpea, sorghum, etc. The observations for the evaluation were recorded, when it was being used to plant cowpea on the operational scale on a production system research field of CPATSA.

A single man can operate the planter continuously for a working day (6 to 8 hrs) with a walking speed of 1 ^M km/sec. The various observations recorded are as follow.

- I - Hill distance - 20 to 24 cm (can be varied if needed)
- II - Seeds per hill - 4 to 8 randomly distributed (adjustable with a screw)
- III - Row distance - 75 cm (can be varied if needed).
- IV - Area covered
 - (a) Theoretical field capacity - 0.27 ha/hr
 - (b) Actual field capacity with field efficiency (66%) - 0.18 ha/hrs
- V - Seed rate obtained 355,555 seeds/ha.

Anex. III - Item 15 (Atividades que serão desenvolvidas no próximo trimestre, relacioná-las e indicar o local de execução).

1. Fabrication of attachments for the wheeled tool carrier.
2. Testing of wheeled tool carrier and its attachments for various operations.
3. Visit to various others regions of Northeast Brazil to study in-depth the present status of mechanization.
4. Visit to various agricultural implements (Manual or animal) manufacturers to study the manufacturing facilities for the production of improved equipment and extent of sale of existing equipment.