

Fol
1420

INFORME TRIMESTRAL DE ATIVIDADES

1 - Nome do Consultor: HARBANS LAL

2 - Período: 1 JAN to 30 March 1980

3 - Título do Projeto: Agricultural Mechanization for Semi-Arid Tropical 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 and ICRISAT, Hyderabad, India.

8 - Técnicos colaboradores (relação nome/cargo)

Pêricles Ferreira Nunes co-project scientist

9 - Trabalhos realizados (descrição sumária)

Refer Anex I

Agricultural mechanization f
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10 - Resultados concretos obtidos nas instituições assistidas:

Refer Anex II

11 - Metas alcançadas:

1. FABRICATION OF ATTACHMENTS OF WHEELED TOOL CARRIER
2. TESTING OF WHEELED TOOL CARRIER AND ITS ATTACHMENTS
3. IN-DEPTH STUDY OF PRESENT STATUS OF MECHANIZATION
4. AGRICULTURAL IMPLEMENT INDUSTRIES SURVEY

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

0	6	0
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Outros

0	6	0
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14 - Perspectivas, ambiente de trabalho, interesse das instituições que são consideradas importantes para a marcha das atividades. (Deverão ser incluídas, neste item, 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: 15.04.80

17 - Assinatura do técnico responsável.

HARBANS LAL

I) FABRICATION OF ATTACHMENTS OF WHEELED TOOL CARRIER

The attachments for the wheeled tool carrier (developed and reported in the last trimester) were fabricated in a local workshop. To make wheeled carrier or to that extent any mechanization fully beneficial, it must be accompanied by other inputs of improved technology such as high yielding varieties, fertilizers and improved soil and water management. The CPATSA has adopted broad bed and furrow system of cultivation as a base for improved farming system. With these points in view, all the attachments fabricated or adapted are to improve cultivation efficiency on broad bed and furrow system. However this does not limit the tool carrier to be used on flat or any other system of cultivation. The set of attachments fabricated are (I) Left and right hand plows, (II) Ridgers and float to form or reform broad beds and narrow ridges, (III) Set of cultivators for secondary tillage and inter-row cultivation, (IV) A funnel type planter to seed two or three rows on the bed depending on the crop.

II) TESTING OF WHEELED TOOL CARRIER AND ITS ATTACHMENTS

It could not be possible to test the wheeled tool carrier in the field because of non availability of suitable type of animals. The workshop test for various mechanisms of the tool carrier performed satisfactorily. It is possible to mount all the attachments fabricated. The lifting mechanism which is assisted by a spring can be easily operated by the operator sitting on the right side of the chassis of the tool carrier. In general the dimensions of the machine suit very well to an average size of bullocks of the region. The laboratory test of the funnel type hand metering planter showed equal distribution of the seeds through different sprouts. The furrow openers of the planter are also provided with covers to put the soil on the planted seeds and compact them for necessary seed soil contact to achieve high rate of emergence.

The training of animals and operator to be used with the wheeled tool carrier, which was initiated and reported in last trimester report did not bear fruits because animals presently available with CPATSA are habituated to go round for sugarcane crushing and even after continuous training for two months

it could not be possible to train them to go straight in the furrows with the desired load of working implements. Finally it is decided to procure another pair of bullocks which is habituated to work in the field as a pair and with mould board plow conventionally used by the farmers of the region.

III) IN-DEPTH STUDY OF PRESENT STATUS OF MECHANIZATION

The observations for the study were recorded during the various operations carried out at the production systems research plot at Catinga, Petrolina and on the on-farm cooperative research projects at Ouricuri (PE). Though, there exists a great potential for improving the efficiency of various operations presently done for broad bed and furrow system, but the planting and machinery used for planting need considerable improvements and immediate attention. A single row manual planter (dribber) locally called "Matraka" or "Tico-Tico" is used generally to plant all the crops. Some of the observations about this planter recorded earlier were reported in last trimester report (Oct-Dec. 1979). The limitations which make this planter inefficient are listed below:

- I) It is not possible to adjust it for optimum seed rate for small seeded crops such as sorghum and millet.
- II) As depth of the seed placement and the distance between and within the row is dependent on the skill of the operator for each row and each hill within the row, there is a great possibility in variation of the depth of seeding and row distance.
- III) The planter does not have a covering mechanism, and when it is used in moist soil condition, which is generally the case for rainfed crops of the region, an extra man is required to cover the seeds.
- IV) Technically the machine is a dribbler and is good for hill planting where a fixed number of seeds are dropped at a point at certain interval and these points are referred as hills. Dribbler is generally not suitable for the crops as maize, beans and sorghum. The basic requirement of these crops are that they should be planted continuously with a defined within row spacing. The machines used for this type of planting are called, technically, planters or seeders.

IV) AGRICULTURAL IMPLEMENT INDUSTRIES

The role of agricultural industries in mechanization program is well established. No machinery development program can be a great success without proper involvement of the industries. The large scale demands of the machinery can only be met by established manufacturers. It is also advisable to know the details about presently manufactured machines, their production process and approximate number of pieces sold annually preferably on regional basis. With these points in view a visit was made to various agricultural implement industries. During the visit it was also aimed to acquaint industrialists about the machinery being developed at CPATSA and to know their reactions about the possibility of being manufactured on large scale. During the trip of 10 days with effective 5 working days, only three industries namely BALDAN, - Implementos Agrícolas, MATÃO SP, José J. SANS SA Industria e Comércio, Santa Bárbara D'Oeste, S.P. and MÁQUINAS AGRÍCOLAS ALTIVO S/A, M.G. were visited. The major products of these industries are mechanised equipment. They concentrate only 1-5% of their total resources on animal traction equipment. "Sans" and "Baldan" manufacture single and reversible mould board plows, disc harrows, laterally expendable cultivators and some type of planters. "Altivo" which initially used to manufacture reversible M.B. plows has now stopped producing it any further and has directed all its resources for production of different types of sugarcane crushers.

The literature available with various industries in terms of presently produced machinery, their production systems and organisational setup was collected and is being compiled in a paper "AGRICULTURAL IMPLEMENT INDUSTRIES OF BRAZIL AND THEIR INFLUENCE ON POPULARISING LOW COST FARM MACHINERY FOR USE ON SMALL FARMS".

In general the industrialists and their technical staff were quite impressed by the concept of tool carrier system of machinery package as compared to individual implement for each operation. Some of them even expressed their desire to visit Petrolina to see the machine in detail once it has been thoroughly tested under field condition.

At present equipment need of the small and marginal farmers is met by these established industries which concentrate only a marginal component (1 to 5%) of their resources in small equipment which ultimately results with limited attention by these industrialists. The concept of the urban base small workshops for producing small equipment, as prevalent in many other developing countries, can be tried in Brazilian conditions also. The similar fact was also narrated by an expert committee

of Centro de Estudos e Experimentação de Maquinaria Agrícola Tropical (C.E.E.M.A.T.)
France in 1978^(*).

(*) "Missão de Estudos sobre as Possibilidades de Desenvolvimento da Cultura com Tração Animal no Nordeste e Norte do Brasil".
Missão SUPLAN/Ministério do Exterior Direção da Cooperação Técnica/IICA, CEE
MAT, PARQUE DE TOURVOIE, 92160, ANTONY FRANÇA de 13 a 30 de novembro de 1978.

ANEX II - Item 10 (Resultados Concretos nas Instituições Assistidas)

- I. A set of tool carrier based equipment package is available with CPATSA, which can be experimented with the broad bed and furrow system of cultivation, a new system being tried by CPATSA under its production systems research.
- II. The local urban based workshops are capable to fabricate agricultural implements and produce them on limited scale particularly of interest to small and marginal farmers. This fact clearly reveals itself on the basis, the owner of the workshop where first prototype of tool carrier is fabricate has offered to reproduce the units at 2/5th price he charged for the first prototype.
- III. The pair of animals available at CPATSA are not good for agricultural operations specially on the broad bed and furrow system of cultivation. The search has been initiated to replace them with a pair well trained for field operations.
- IV. There exists a great scope for improving the efficiency of various operations presently done for broad bed and furrow system, particularly planting and fertilizer application.
- V. There exists a great potential in exploring the possibility of use of funnel type hand metering planter to improve the present planting techniques specially with a local planter called "Tico-Tico".
- VI. Presently the equipment need of all categories of farmers is met by big established industries, it seems that a great potential exists in promoting urban based small workshops to cater some of the needs of small and marginal farmers.

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

- I. To procure and train a pair of bullocks to work with tool carrier and its attachments.
- II. To test tool carrier and its attachments under artificially created conditions during dry season.
- III. To orient and supervise a graduate student to carryout "Comparative Evaluation of Various Seed and Fertilization Technique" at CPATSA, Petrolina, PE.