

## QUARTERLY REPORT

Doc 4P  
For the period: July through September 1983

IRRI/USAID Contracts: 1) Applied Agricultural Research Project 497-0302, and 2) Extension of Small Scale Agricultural Equipment, IRRI : 492-CA-1707, and Luwu 497-0244.

## EXECUTIVE SUMMARY

1. Dr. J. Ritchie Cowan departed Indonesia on 10 September 1983, after six years of interested and highly active participation in food crops research in Indonesia. His many friends in the agricultural community will miss his friendship, counsel and participation in activities of mutual interest.
2. Messrs. M.R. Vega, J.R. Cowan and W.C. Tappan travelled through East and West Malaysia and Brunei over 12-25 August, as a final visit for Dr. Cowan, an introduction for Mr. Tappan and a scheduled visit for Dr. Vega.
3. The Farming Systems consultant remained actively engaged in a variety of activities, produced three technical papers, and continues to participate in the USAID effort to develop a strategy and Project Paper for upper river watershed development. The AARD project proposal for Crops/Livestock has been completed.

4. The Consequences of Small Rice Farm Mechanization Project was brought to a successful conclusion with the conduct of two workshops and a seminar, which have led to the appointment of a committee to draft a national strategy for agricultural mechanization in Indonesia.
5. The demand for rice threshers continues to increase and August 1983 figures show 450 threshers produced by 14 West Sumatra manufacturers. In South Kalimantan the demand for axial-flow water pumps is on the increase and some 60 pumps have been fabricated by local manufacturers.
6. Water management is becoming an increasingly high priority and, although at a relatively low level, research is gaining momentum in Indonesia and a significant breakthrough will be made with the expected signing of an agreement between AARD and the Jatiluhur authority to conduct research jointly on a pilot area within the system which commands some 260,000 hectares.



SUGGESTIONS

FOR

A DEVELOPMENT STRATEGY OF FARM MECHANISATION IN INDONESIA

BY

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Jakarta-Indonesia

September 1983.

### Background Information :

During the final seminar (on August 8, '83) organised by IRRI at the end of its 3 year survey on "Social Consequences of Mechanisation", the need for a national strategy for the future development of farm mechanisation has been stressed and a team has been appointed by the chairman<sup>\*</sup> to prepare the guide lines for a long term strategy and to suggest an action programme for the Government's consideration.

Having gained valuable experience in the implementation of our (IRRI-DITPROD) industrial extension project during the last five years (Since May '78) in the four selected provinces (West Sumatera, West Java, South Kalimantan, South Sulawesi) we wish to put forward our views/suggestions to the above team (as input material) for their consideration in the preparation of development strategy of farm mechanisation in Indonesia.

### Learning Approach and not a Blue-print Approach :

In all such centralised planning efforts, there is a tendency to make major and most of the decisions at the top by the few "Knowledgeable" people (at the centre) thus, a blue-print (top-down) approach is most often adopted. As a result, we find many plans (specially in the developing countries) are seldom successful in their implementation. Adopting a learning approach by starting on a pilot/small scale basis has taught us a great deal about the local priorities of equipment and the extension methodology that is more effective.

\* Mr. Syarifuddin Baharsja Secretary General of Agriculture-Ministry Government of Indonesia.

This bottom-up approach may seem a slow process in the early stages, but is likely to spread more rapidly and will prove cost-effective, according to our experience.

#### Choice of Technology :

Again from our experience, to achieve a wide spread effect at the grass-roots level, the technology chosen has to be simpler and be fabricatable locally by a myriad of small workshops spread throughout the interiors of the country. This concept is finding favour with many developing countries. Government of Indonesia also seems now convinced of this approach and has started laying greater stress on local manufacturing programmes, as a national policy.

The next question is what are all the farm tools/machinery that are appropriate for Indonesian conditions. We have made an attempt to list (enclosed herewith) such farm equipment (for food crop-production) indicating their present stage of development and future priorities for different areas of the country.

#### Determining Priorities :

What are the priorities for taking up the research and development work (until they are ready to be released for

extension work) and which organisations in the country (like Subdirectorate PAMP or BPTP Sukamandi, BPTP Maros, IPB/Gajah Mada/ITB, LIPI, M.I.D.C., etc.) can be assigned with this assignment and under what time-frame ?

Here we may add, from our experience, that even after bringing the tested designs and technical detail drawings from IRRI-Phillippines, a lot of modifications and changes had to be made here, in order to use locally available materials, and a completely new set of drawings were made ready for distribution to local manufacturers. In this local standardisation effort, and in making production aids we have taken the assistance of M.I.D.C. Bandung. Infact we have been able to develop a close cooperative working relationship with M.I.D.C. and Provincial Perindustrian offices in training and assisting small workshops in South Kalimantan and West Sumatera provinces.

For determining research and development priorities we feel the above mentioned appropriate farm equipment list needs to be expanded after careful deliberation, specially with the agricultural departments in provinces who are in touch with local farmers and are aware of their constraints and needs. For exemple, we find the first priority now in South Sulawesi is for land-preparation, in South Kalimantan for water pumping, and in West Sumatera (after paddy threshers have been successfully introduced) land preparation equipment is needed on priority.

We, are aware that with the limitation of trained man power and financial resources, it is very important to choose the priorities correctly. We found it to be a better strategy to concentrate in few selected priority areas and carry out the extension work in a concerted manner until a "take-off Sustainable growth" stage is reached.

However, we have to be clear about the criteria and the methodology in selecting priority areas for the introduction of new farm equipment.

A few important factors/reasons that could determine the selection of priority areas are :

1. Actual food crop production compared to the potential of the area. Higher the difference, greater the priority could be.
2. Major constraints, like insufficient availability of labour resulting in high local wages, (as in outer islands compared to inner islands), resulting in large areas of cultivable land not being cultivated (as being reported from South Sulawesi and West Sumatera).
3. To increase the cropping intensity, by decreasing the turn around time between the crops as identified in Jatiluhur irrigation area of West Java, or by providing lift irrigation can increase one more crop (and also assured crop) in swampy areas of Jambi, South Kalimantan and West Kalimantan, etc.

These are only few examples cited here. For national planning, a detail exercise has to be carried out involving provincial governments to prepare a map showing priority areas and the type of farm equipment required in each contiguous area and their order of priority. To carry out this function satisfactorily, the existing secondary data alone may not be adequate. More detailed economic surveys are perhaps needed, to be carried out in certain potential areas with the help of institutions like Agro Economic Survey at Bogor involving the concerned provincial government staff.

#### Field Extension Methodology :

The major experience that we gained through our project (IRRI-DITPROD ; ATA 220) implementation has been in developing the field extension methodology to a successful "take-off -sustainable growth stage", which we think West Sumatera has reached in the case of paddy threshers. In other words, the production and sales of these threshers is continuously expanding there on its own momentum without further assistance /support from the Government or outside agencies. The latest production figures in West Sumatera show that 14 small workshops are engaged in the fabrication which have produced more than 450 threshers (from '79 until August '83) and continuing to increase in geometric progression. Their quality has improved, while their selling price has decreased (from Rp.- 550,000,- to Rp. 350,000,- without engine).

In fact through a few active dealers, some of the local manufacturers have started exporting their products to the neighboring provinces like Jambi, Riau, Aceh, etc. We are now intensifying our efforts in this province to introduce Hand Tractors with all its attachments not only for land preparation but also for harvesting and rural transportation (with a trailer). This model Hand Tractor with the attachments has started showing promising results in kabupaten Luwu of South Sulawesi. Similarly in South Kalimantan axial flow pumps are gaining momentum.

These cases are mentioned only to show the effectiveness of the extension methodology we have pursued. Briefly the extension methodology that has evolved from our work is as following :

1. Before we introduce any new farm equipment in a new area, it is very important to make sure that the equipment is thoroughly tested and is found suitable under local conditions. Necessary training to operate and repair the equipment is to be imparted to the local DIPERTA staff who are going to be involved in the extension work.
2. Creating the initial demand for such farm equipment is very crucial. For this purpose extensive demonstrations in farmers' fields are to be carried

out initially. We found that due to the limitation of staff and budget in DIPERTA offices, one of the effective ways to create demand is to identify a few progressive farmers/cooperatives in the area (to be popularised) and encourage them to use the equipment for a season or two in their fields and also allow them to lease the equipment to their neighbouring farmers. However, it is important to monitor and support this activity carefully by the staff of DIPERTA. From our experience in West Sumatera and South Sulawesi this creates the chain reaction of interest among the farmers.

In areas where local initiative is lacking, it may be helpful to form commercially oriented public organisations (like P.T. Tani Makmur under Bank - Pembangunan Daerah in West Sumatera) or Non Government organisations (NGO) to hire/lease out farm equipment to needy farmers and later to initiate the local manufacturing process. This may be necessary for example in transmigration: areas where the Government feels the need to introduce such equipment to increase the full utilisation of the land allotted and the income of the transmigrants.

3. Simultaneously to identify a few (at least 2 or 3 to start with) potential fabricators (with the participation of Perindustrian staff) in the province

and assist them technically and financially (by providing a sample and for purchasing the materials) to fabricate the first proto-types. They need to be carefully nursed in initial stages. They should in fact be encouraged to lease out the first pieces of equipment to nearby farmers for a season or two under their close supervision so that they learn about few modifications/quality improvements they may have to carry out in their products. Also this should help them in creating their own market. We have successful examples of this approach in West Sumatera and South Kalimantan.

4. We found two kinds of training for the field extension work useful

i). For the provincial staff engaged/connected with field extension work in departments like DIPERTA, Perindustrian, Koperasi, Banks, Local Government and also non-government organisations (NGO) which are working actively with the farmers, a training programme for about a week's duration preferably at the centre to be organised. It's main objective is to acquaint the staff with the farm equipment (to be introduced in their areas), and to discuss their feasibility studies and the extension methodology to be adopted.

ii). The second type of training is for local fabricators at the provincial level. These are to be conducted as detail technical training

programmes lasting for 2/3 weeks, mainly to train them in the fabrication, repairing and operation of the farm equipment, preferably in collaboration with the industries department.

5. Coordination/networking functions with the various concerned agencies can best be done by organising periodically (at least once a year) a field day exhibiting/demonstrating improved farm equipment, to be followed by a group discussion /seminar to exchange useful information both at the centre and at the provincial level.

At the centre this opportunity can be very well utilised (in addition to informing high Government officials of the various ministries to show the progress made) for networking/coordinating with agencies like Subdirectorate PAMP, Directorate of small industries development, M.I.D.C., B.P.T.P., I.P.B., I.T.B., Gajah Mada, B.I., B.R.I., BULOG, Koperasi, Alsintan, etc. Agenda of such a meeting/seminar/workshop could review the progress made in the implementation work and discuss future plans, priorities and policy recommendations to be made to the National Farm Mechanisation Council (NFMC).

At the Provincial level such an annual opportunity (preferably on farmers' day, "Krida Tani") can bring the leading farmers' representatives, local manufacturers,

concerned government officials from various departments like DIPERTA, Perindustrian, Bank, Koperasi, etc., face to face and exchange very useful information like the farmers' response and priorities and their difficulties in the popularisation work of the farm equipment. This useful information can be fed back to the Secretariat of NFMC at the centre.

We found one follow up meeting after every seminar/workshop is a very useful exercise to keep up the continuity both at the centre and at the regional level.

6. We feel it is very important to synchronize all activities budgeted through DIP towards specific goals set for the year not only within the department but also between the coordinating departments. In order to make this point clear, may we illustrate it with an example. If certain number of provinces/areas have been chosen to introduce selected farm equipment on priority basis, the activities of say Subdirektorat PAMP (such as providing materials/equipment, conducting training and guidance visits to the areas, etc.) are directed towards attaining the specific goals, at the same time the other coordinating agencies like DIPERTA, Perindustrian both at the centre and at the provinces should also have similar activities which are budgeted through their DIP. In other words at the time of DIP preparation also, close coordination is required between the departments/agencies of the Government which have to work together to synchronize their activities in the field.

7. We are all aware of the vital role an inhouse Newsletter can play in networking with several agencies/individuals involved in this task. Recently Subdirectorate PAMP has taken the initiative in this direction, and has brought out two issues. In order to make it into a two-way communication media, we perhaps need to up grade it by taking professional advise and assign it to professionally qualified /trained personnel who can devote sufficient time for it. Circulation list in addition to several agencies mentioned above may desirably include PPLS and LKMD in the selected provinces. Well prepared technical brochures/leaflets and service manuals also play an important role in the extension process.

National Policy Making/Coordinating Body :

To prepare the background material/reports for NFMC meetings and to advise them on policy decisions to be taken by the Government of Indonesia, it is essential (as advised by RNAM) to have a technical committee/coordinating body with a small but effective permanent secretariat (which is yet to be formed). For the integrated and rapid development of farm mechanisation in Indonesia, there is no doubt that this proposed technical committee has to play the key role of a "dynamo" specially in the early stages.

Summary of the above Suggestions :

1. Learning approach through pilot scale trials in the initial stages is likely to be more successful and cost effective than a large scale "Blue-print" approach in the introduction work of new farm equipment at the "Grass-roots" level in the new areas.
2. Choosing simpler technology of farm equipment which can be locally fabricated by small workshops are likely to spread more rapidly in the rural areas.
3. Preparation of a list of farm equipment (at different levels of technology such as manual/animal/power-driven) showing their order of priority which are to be developed/adapted within the country. (detail-note enclosed).
4. Networking the local R & D institutions and guide/coordinate their priorities and their output by the technical committee of NFMC.
5. To prepare a map of the country showing the priority areas for introducing new farm equipment (and their priority) for taking up intensive field extension work.
6. Socio-economic surveys to be conducted, in order to determine farmers "Constraints" and the priority needs

of farm equipment and later their impact keeping in view the welfare of small farmers and land-less labour.

7. With the given man power and financial resources available, it is better to concentrate and continue the programme until the "take off-Sustainable growth" stage is reached.
8. Effective field extension methodology that has evolved from IRRI-DITPROD industrial extension project is briefly as following :
  - a). Initial farmers'demand is to be created through extensive demonstrations of the new farm equipment being introduced in farmers'fields.
  - b). At least 2 or 3 potential fabricators in the selected provinces are to be identified and assisted initially until their production and sales steadily rise.
  - c). Training programme to be conducted one for the provincial Government extension staff (preferably at the centre with the participation of similar provinces) and the other to the operators/repairers/fabricators of the farm equipment at the provincial level.
  - d). Annual field days to be organised both at the centre and at the provinces and conduct group meeting/seminars not only to exchange useful information, but also to review and evaluate the progress made so far in implementation and in making plans for the future.

- e) Synchronizing the activities funded through DIP among the various Government agencies which have to work in an integrated manner is quite essential.  
(Guidelines suggested in enclosure II)
- f) Professionally a well-done periodical Newsletter as a media for a two-way communication can play a vital role to strengthen national networking and keep up the tempo of farm mechanisation in the country.
9. Formation of a strong technical committee/coordinating body supported by a small permanent secretariat to advise NFMC and to act as the "dynamo" in the development of farm mechanisation in Indonesia is the first important step to be taken.
10. The above technical committee to take the initiative to prepare the detail plans for the proposed National Farm Mechanisation Development Institute which is essential in view of the increasing important role the farm mechanisation will have to play in the long term development of the country's economy.

Finally a long term plan of this nature to be successful has to be a continuous process integrated with its implementation and with a built in feed back loop for continuous renewing and amending the course as it may necessitate.

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VRR/T

Sept. '83

terangan : X selesai dibuat  
- Jadwal pengujian

RENCANA KEGIATAN  
Bengkkel Tanjung Barat

Tanggungjawab :  
\* Terjemahan gambar  
\*\* Inventarisasi masalah untuk setiap komo-  
diti alsin rancangan IPRI+Penelitian MHS.  
(ada saja yg. perlu dilakukan Studi Alsin.)

Kegiatan	Vol	Agustus				September				Oktober				Nopember				Specialist
		I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	
<u>Pembuatan</u>																		
a. Cage wheel conus (traktor kecil)	X ---																	Kasiman, Endon, Suwardi
b. Reaper 1.0 m	X 1																	Kasiman, Endon, Suwardi
c. Reaper 1.6 m	2																	Kasiman, Endon, Suwardi
d. Gear box traktor - tangan 6-8 HP	1																	Kasiman
e. Pompa air vertikal 6" (bensin dan "v" belt)																		Mahasiswa
f. Gear box Traktor - tangan 4 HP	3																	Kasiman, Endon, Suwardi
g. Jig gear box traktor-tangan 6 HP	1																	Kasiman, dkk-
h. Thresher model SB	1																	Samirun, Endon
<u>Pengujian</u>																		
a. Pompa air aksial 6" - 2 propeler	1																	Kamto Bayu
b. Pompa air vertikal 6"	1																	Kamto Bayu
c. Pompa air aksial 8"	1																	Kamto Bayu
d. Transplanter	2																	Made & Suwardi
e. Reaper 1.0 m & 1.6 m	2																	Mahasiswa
f. Thresher	2																	Mahasiswa
g. Traktor 4HP dan perlengkapan semua	1																	Kasiman & Koes S.
<u>Pengiriman:</u>																		
a. Gear box	1																	Kamto Bayu
b. Reaper	3																	Zaidir Said
c. Jig box transmisi	2																	Koes S.
<u>Gambar kerja ;</u>																		
a. Reaper 1.0 m	1																	Koes S, Soehardjo, Made
b. T. Tangan (modifikasi)	1																	Koes S, Soehardjo, Made
c. Thresher SB.																		Koes S, Soehardjo, Made
<u>Seminar</u>																		
Traktor tangan 4 HP	1																	Mahasiswa
Pompa air vertikal																		Kamto Bayu
Pompa air 2 kipas																		Kamto Bayu
<u>Pembinaan :</u>																		
a. Evaluasi																		Koes S.
b. Latihan																		Zaidir Said
c. Bimbingan																		Zaidir Said.



# IRRI-DITPROD INDUSTRIAL EXTENSION PROJECT

P.O. BOX 18/KBYPM. PASAR MINGGU, JAKARTA SELATAN INDONESIA TELEPHONE : 782557

September 30, 1983

To : Mr. Walter C. Tappan  
IRRI Liaison Scientist

From : V.R. Reddy *V R Reddy*  
Agricultural Engineering Consultant

Subject : Quarterly Report  
July through September 1983

## T r i p s

July 27th : To visit Sukamandi with Sdr. Zaidir (for attending seminar consequences of Mechanisation).

July 28th - July 29th : To attend RNAM workshop in Yogyakarta.

August 1st - August 5th : To attend seminar and visit Luwu district with Sdr.Koes.

August 22th - August 24th : With Sdr. Zaidir to monitor the progress of our project work in West Sumatera.

September 27th-September 28th : To visit Subang and Bandung with Sdr. Zaidir to study the potential for IRRI type equipment.

## IRRI-DITPROD

1.

After attending the ASAF meeting (June 26th - 29th) and the annual leave resumed the duty at Jakarta on July 14th.

Attended the series of conclusive seminars (consequences of mechanisation survey) organised on July 27th at Sukamandi, at Maros on August 1st and 2nd and the final one at Jakarta on August 8th. In addition to our active participation in the above series of seminars, we were able to arrange the field demonstrations of IPRI type farm equipment at Sukamandi and Maros. This generated considerable interest among the Provincial Government staff including Bhupatis and the farmers' representatives who were present on the above occasions and witnessed the equipment, for the first time. As a result two IPRI hand tractors were specially requested by the Bhupatis of Sidrap and Pinrang (where maximum number of imported mini tractors are operating!) from the DIPPTA of South Sulawesi to be demonstrated in their districts. They are presently being used in the farmers' fields and the initial reactions are quite favourable.

In the above seminars it has come out clearly that there is a definite need for mechanisation for certain agricultural operations (specially for the land preparation and pumping in West Java and South Sulawesi) and

**IRRI-DITPROD**

2.

that the imported tractors were not suitable and economical to the local conditions. Also in the final seminar at Jakarta, the need for preparing a national strategy for the future development of farm mechanisation in Indonesia has been stressed.

As input to the above national strategy formulation, we have prepared a paper on "Suggestions for a Development Strategy of Farm Mechanisation in Indonesia" a copy of the same is enclosed. We are planning to organise a seminar inviting the representatives from the various departments/agencies connected with the Agricultural mechanisation in the country to discuss and consider the suggestions made in the above paper.

During this quarter the work plan for building proto-types of farm equipment, their testing and modification work at Tanjung Barat workshop is enclosed. Three more students from ITB & IPB were assisted in their testing and modification work (for their thesis) during this period.

In Luwu, five hand-tractors sold through the FCC to the farmers and three out of the four hand tractors

## IRRI-DITPROD

3.

of PEC are being continuously used for the land preparation and the transportation. The remaining two are under repair at the workshop (Sidodadi) in Palopo.

We have assisted this workshop to build two new hand-tractors which are completed. As earlier reported the major constraint now is providing the credit to the farmers. So far more than sixty farmers have applied for the credit to the FCC at Bone-bone to purchase this type of hand tractors with trailers.

We have assisted FCC in preparing the feasibility report to BRI to enable them to provide the necessary credit to the needy farmers. Since then we have approached the BRI officials at Palopo and Ujung Pandang along with the FCC officials, but so far without much success. We are now pleading with the FCC to take the initiative by providing credit to start with at least to the few selected (among their member farmers) so that the enthusiasm/interest generated among the farmers in Bone-bone and the workshop at Palopo is not dampened.

The two paddy threshers manufactured at Massere and Rapang are under field test under the guidance of DIPERTA officials.

**IRRI-DITPROD**

Unfortunately this year no budget has been provided for the DIPERTA staff of South Sulawesi to conduct field demonstrations and to monitor the progress. We are therefore having to provide small budget for one field-trip/month so that this activity does not come to a grinding halt.

In West Sumatera the growth of paddy threshers' manufacturing and sales continues to rise rapidly. The last reported figures (as of August '83) are 450 paddy threshers produced by the fourteen manufacturers. Seeing the rising demand of this type of threshers the minister for cooperatives recently announced that the Government will provide funds for 200 pieces to be manufactured and sold to the local cooperatives. As reported earlier these paddy threshers are finding their market in the Sumatera and Aceh.

One of the local manufacturer Mr. Asparmin (of Tembok-Jaya) has been sent for the three weeks training at IPRI Los Banos and has just returned. He has also received the Bank Credit from BPD (through our recommendation) about \$ 13000 to build new shed and add workshop equipment.

## IRRI-DITPROD

With this growing successful experience, the DIPERTA officials of this province are now enthused to give a push to the introduction of hand tractors during the coming season. Through this project assistance four hand tractors with the attachments were built in their Bukit Tinggi workshop which are now being demonstrated in three Kabupatens to generate the awareness/interest among the farmers. Meanwhile we are preparing the training materials and the necessary hardware etc. required to conduct two-week intensive training (for the local-workshops) in cooperation with M.I.D.C. of Bandung during the month of December '83.

In South Kalimantan the growth of axial flow-pumps is quite encouraging. More than 60 pumps have been fabricated by the two local manufacturers. The second manufacturer is being assisted to build hand tractor and thresher for the first time. One of the DIPERTA staff members Mr. Suherdi has been also sent recently to IPP1 Los-Banos for the three week training programme.

In the coming months with the full involvement of this trained staff member, the project activities are likely to be intensified further.

**IRRI-DITPROD**

6.

Currently we are building modified versions of pedal-threshers and pedal winnowers suitable for the small-farmers in West Java. Planning to field test them in several farmers' fields during the coming harvesting season. Also we are pushing the use of axial flow-pumps in this province for the rain-fed areas with water resources. In the district of Subang there seem lot of potential for such pumps. Already one small workshop at Jati Barang has produced and sold six axial flow pumps. We are collaborating with an active non-Government organisation, Bina Swadya to field-test and monitor in West Java pedal threshers/winnowers, Rolling injection planter, PT-5 Hand-taractor with attachments and axial-flow pump with two propellers during the coming year.

In Indonesia voluntary service organisation (supported by the Government of Britain) is very active and has more than 150 young volunteers presently working with the various Government organisations in the country. We felt the need for two volunteers to assist our project, one in Jakarta in building proto-types and developing production aids and the other one for West Sumatera to assist the DIPPTA staff to carry out the local modification work there and in training the local workshops

## IRRI-DITPROD

to increase their quality and productivity. As per their rules the local expenses required for their boarding and lodging and transport which would come to about \$ 200/month are to be met from this projects budget to which we have agreed.

The two selected candidates have already come to Indonesia and are now in Yogyakarta undergoing the language training. They will start working with the project from November '83 onwards until August '85. Copy of their bio-data is enclosed.

CC : Mr. C.W. Bockhop

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