

Symposium on Farm Mechanization

October 12 to 14 1970 in Tokyo



Farm mechanization in Asian region is still quite limited in its scale both in area and kinds of farm operation. However, much more importance should be placed on mechanization of farm operation from the viewpoint of in-

creasing land and labor productivity.

In this connection the 4th international symposium of Tropical Agricultural Research Program took up "Farm Mechanization" as its subject, and particularly the mechanization of rice production with special reference to technological problems was discussed.

This symposium was held in Tokyo for three days from October 12 to 14, 1970. After the session the participants made a three-day field trip to the Institute of Agricultural Machinery, the Farm Mechanization Division of the Shizuoka Prefectural Agricultural Experiment Station, and the project areas for agricultural structure improvement in Shizuoka Prefecture.

Eight participating countries of the Re-



public of China, India, Indonesia, Malaysia, Pakistan, Philippines, Thailand and the Republic of Vietnam were invited to send a delegate to this symposium, and a guest speaker was invited from IRRI. Unfortunately, Ceylon was not able to dispatch its delegate because of pressure of official business of the home government.

Outline of symposium reports

1) Reports by delegates from Southeast Asia countries

(1) Importance of mechanization

Cultivation of some plantation crops such as sugar cane has been mechanized but rice, their staple food, still requires extensive cultivation depending on cheap manual labor and the insufficient animal power. However, such conventional types of labor force are not enough to give satisfactory performance in rice cultivation. The recent general hike in wages and the exodus of farm population to urban areas have steadily increased the demand to mechanize farmlands.

Mechanization is now urgently needed because it is expedient to conduct each farming operation at a proper time and for a short period in order to promote double cropping of rice.

Machinery is more superior to give efficient operation compared to conventional manpower and animal power, and in most cases the former costs about one half of the latter.

The current problem facing the farmers is that they do not earn enough income or own sufficient accumulated capital to introduce farm machinery. So at present problems tend to be increasingly solved by customary farm service rendered by contractors.

Mechanization so far has been limited to transporting, plowing and harrowing. Moreover attempts are being made to mechanize other farming operations such as harvesting and drying paddy.

(2) Mechanization problems

Though many farmers highly evaluate the advantage of mechanization, machinery has

not been introduced on a wide scale in farming mainly attributed to their social and economic difficulties in addition to technical problems coming under climatic and soil conditions of the tropical region; namely, small and fragmental holdings, farmers' small income, shortage of credit for mechanization, high cost of machinery, dearth of trained operators, equipment and skilled workers to repair and test machinery, and existence of potential unemployed workers in agricultural districts.

However, in each country, the number of tractors has increased twice or more than a few years ago and farm mechanization is proceeding steadily, though somewhat slowly.

(3) Policies for promoting farm mechanization

Each country has tried or is planning to grant a subsidy or furnish funds to purchase machinery, train engineers, hold demonstrations to introduce new machinery, set up a pilot project farm and to develop and improve machinery. It was suggested that to stimulate and promote researches on farm mechanization each country under similar management and cultivation conditions should jointly conduct experimental tests, study and train operators.

(4) Evaluation of Japan-made farm machinery, principally small-size export machinery and its durability

Japanese farm machinery which is usually excessively complicated to meet farmers' strict requirements fully does not often satisfy developing countries' farmers who demand simple and strongly-built machinery. Rotary teeth are particularly easy to break in solid soil so it is necessary to improve the metal quality of the machinery, strengthen its structure and facilitate accessibility of machinery parts. Harvester, automatic thresher and miller should be made suitable for tropical conditions.

2) Studies on farm mechanization at International Rice Research Institute

This institute is promoting the development and improvement of various kinds of machin-

ery for paddy field of tropical Asian countries. It also aims to develop machinery which is suitable for farm management of 2 to 10 ha., comparatively simple structured and highly efficient in saving labor, and to help each country test its machinery at paddy field and improve it. It reported on the development of machinery such as drum thresher effective for paddy of high moisture content, rotary power weeder and small four-wheel riding tractor moving efficiently even in flooded soils with deep hard pan.

3) Reports by Japanese expert

H. Kaburaki, convener of the symposium, discussed the background of farm mechanization in Japan.

The other reports were presented on the following topics:

Socio-economic problems such as the history of farm mechanization in Japan, and especially development of mechanized family farm (T. Umeki).

Economic evaluations on power tiller, medium-size tractor (17 PS) and large-size tractor (over 34 PS) (Z. Kudo).

Land readjustment for farm mechanization (S. Nakagawa).

Technical problems at each operation of mechanized rice cultivation as follows:

Soil preparation (M. Kisu), pest control (T. Takenaga), direct seeding transplanting (T. Miura), harvesting (H. Ezaki), drying and processing (K. Tani).

Testing and evaluation of farm machinery on market (K. Ogawa).

Case studies of group farming and joint ownership of machine (the areas in Shizuoka Prefecture scheduled for field trip after the symposium were taken up for example) (S. Hayakawa).

On the afternoon of October 14, general discussion was held on both technical and economic problems of farm mechanization, and it was re-emphasized that machinery with simple mechanism which is cheap and easy to operate was urgently needed to be developed, and in this connection Japan's contribution was strongly anticipated by the conferees.

A three-day field trip was made to visit the Institute of Agricultural Machinery and the project areas for agricultural structure improvement in Shizuoka Prefecture where the visiting experts inquired about the farmers' organization and its management after a new machinery was introduced, the reasons behind the increased rice yield by mechanized group farming and the distribution of income attained by cooperative management.

The symposium proved to be very beneficial in helping to promote farm mechanization in tropical Asia. Although the session, lasted only a week, we were able to have the opportunity to exchange information, promote friendship and strengthen mutual cooperation hereafter.

List of speakers

Ahmed, N. East Pakistan Farm Mechanization Training Institute

Tejigaon, Dacca 15, East Pakistan

Boonit, A. Engineering Division, Department of Rice

Bangkhen, Bangkok, Thailand.

Bulanadi, J. Chief, Agricultural Engineering Div., Bureau of Plant Industry, Department of Agriculture and Natural Resources

Manila, The Philippines

Khan, A.U. Head, Agricultural Engineering Department, The International Rice Research Institute

P.O. Box 583, Manila, The Philippines

Mutalib, A. The Federal Experimental Station

Serdang, Selangor, Malaysia

Peng, T.S. Plant Industry Div., Joint Commission on Rural Reconstruction

37, Nan Hai Road, Taipei, Republic of China

- Soedijanto Head, Agricultural Tools and Machineries Div., Directorate of Agricultural Technics, Department of Agriculture Pasar, Minggu, Djakarta, Indonesia
- Truong, D.H. Director, Agricultural Machinery Directorate, Ministry of Land-reform and Agriculture
55 Trần Nhật Duật St., Saigon, Republic of Vietnam
- Zachariah, P.Z. Joint Commissioner (Machinery), Ministry of Food, Agri. C.D. and Coop.
New Delhi, India
- Japan**
- Ezaki, H. Head, 2nd Research Div., Institute of Agricultural Machinery
1-Chome, Nisshin-cho, Omiya-shi, Saitama-ken
- Hayakawa, S. Head, Mechanized Farming Div., Shizuoka Pref., Agr. Exp. Sta.
Miyakoda-cho, Hamamatsu-shi, Shizuoka-ken
- Kaburaki, H. Chief Director, Institute of Agricultural Machinery
- Kisu, M. Senior Researcher, 1st Research Div., Institute of Agricultural Machinery
- Kudo, Z. Chief, 2nd Lab. of Farm Management, Farm Management Div., Tōhoku Agr. Exp. Sta.
4, Akahira, Shimo-kuriyagawa, Morioka-shi, Iwate-ken
- Miura, T. Head, 1st Research Div., Institute of Agricultural Machinery
- Kanagawa, S. Chief, 5th Lab. of Land Improvement, Land Improvement Div., Agricultural Engineering Research Sta.
1943, Yawata, Hiratsuka-shi, Kanagawa-ken
- Ogawa, K. Head, Inspection Div., Institute of Agricultural Machinery
- Takenaga, T. Senior Researcher, 1st Research Div., Institute of Agricultural Machinery
- Tani, K. Chief, 2nd Lab. of Farm Operation, Farm Operation Div., Central Agr. Exp. Sta.
Kōnosu-shi, Saitama-ken
- Umeki, T. Research Officer, Section of Farm Account, 1st Div. of Farm Management, Department of Farm Management and Land Utilization, Nat. Inst. of Agr. Sci.
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