"Field Crops in Thailand" by Dr. T. SATO

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This report is part of a survey on agriculture in Thailand conducted by the Center for Southeast Asian Studies of Kyoto University and covers only the field investigated by the author from October, 1963, to February, 1964. The author clarifies the present state of field crops in Thailand, suggesting improvements.

The author, Dr. Takashi Sato, professor of Hyogo Agricultural College is an agronomist well-informed and experienced on tropical agriculture.

Crops taken up are maize, kenaf, jute, cassava, sugar cane, cotton and pulses. Tree crops such as rubber or coconuts are omitted because of shortage of time for survey, not because of lesser importance.

In the introduction, the author declares that for progress to take place in field crops in Thailand, exports should be increased. For this, efforts should be directed towards improving quality and increased production, especially the yield, by maintaining and raising soil fertility.

In each chapter, state of production by crops is reported first, followed by figure on total production and yield per hectare for each province in 1962. After analyzing several technical problems such as variety, planting, manuring, management, harvesting and processing, improved methods are presented respectively. The author always considers both sides of the problems: small-scale technical improvements for farmers and large-scale government projects···dams for irrigation, breeding, grading of products. His deep understanding of peasant agriculture and affection for the farmers is seen throughout.

The author recommends drilling for jute and late and thick planting for cotton from detailed data of his experiments in Cambodia, where natural conditions resemble those of Thailand. We can call them advanced methods and essential guides for fututre cultivation. Jute is commonly broadcasted by the farmers, but the author's experiments show that yield of green stem differs very little between broadcast and drilled plots. But, the over-250 cm long stems which yield high percentage of fiber recovery, is obtained more by drilled than by broadcasting. Thus, drilling is superior both in yield and quality of fiber and spacing of 40 cm between the rows is best.

In cotton, the early blooming flowers contribute most to yield. However, according to the author, the customary sowing period is so early that many of the flowers are in danger of being caught by late rains of the rainy season. From the ecological study on blooming and boll-opening, he presented a general formula for figuring in advance dates of flowering and boll-opening. If the date of the end of the rainy season can be ascertained, the ideal sowing period can be decided upon from the formula. In Thailand the sowing period presently observed appears to be much earlier than that set by the formula. On the other hand, thick planting will contribute to getting a sufficient number of bolls. The author has confirmed that by late sowing and thick planting, the yield can be increased and the quality improved. With this shortened growing season, the period for previous cropping can be extended and the number of sprayings of insecticides reduced.

The author, realizing the importance of organic matters for maintaining soil fertility, examined leguminous green manure crops, and suggested mungbean as the best for its vigorous growth and high yield. In addition, some of the beans can be harvested while the remainder can be given to animals as feed. The mixture of maize and *Calopogonium mucunoides* is also recommended. Green manure crops are essential for improving field crops in the Tropics.

It is a reasonable conclusion that the safest

and surest way for increased yield in peasant agriculture is to maintain soil fertility by introducing leguminous green manure crops. But for increased production beyond the present stage, application of chemical fertilizers along with organic matters should be emphasized.

This report on field crops in Thailand discusses problems which apply not only to Thailand but to all of the newly developing nations in the Tropics, and is very useful for those concerned with tropical agriculture.

Requests for this book may be made to the Center for Southeast Asian Studies of Kyoto University. No. One in the Reports on Research in Southeast Asia, Natural Science Series; The Center for Southeast Asian Studies, Kyoto, 1966; 148 p. 24 plates, 4 in color.

Rice Breeding for Blast Resistance in Japan
L A Role of Foreign VarietiesL

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Brief history on the breeding up to the birth of "Futaba"

It is well known that the increase in rice yield per unit area has been accomplished by the combined effects of heavy application of chemical fertilizers and breeding of fitting responsers. Since the fertilizer responsiveness of rice variety consists of 3 elements, straw stiffness or tolerance to lodging, resistance to blast disease, and responsiveness in a narrow sense, the reinforcement of these 3 characteristics has been major basic objective through the history of rice breeding for a half century. Especially, stress was put on the breeding of blast resistance in the earlier date because of lacking of effective fungicides.

To find resistant gene sources and to select hybrid lines, two kinds of screening practices became a routine for every breeder, one is the nursery trial for leaf attack, in which rice seedlings are grown on upland condition by late sowing under heavy dosage of nitrogenous fertilizer to induce outbreak of blast, and the other is the field trial for neck attack which comprises of late planting and heavily fertilized condition. In due course of time, some varieties from Formosa or Philippines were found to possess blast resistance much higher than any of domestic varieties around 1917, then attempt was made to introduce resistant gene into local varieties by hybridization. However these earlier works ended fruitless due to the mutual remote phylogenetical distance. Namely the sterility and heterozygosity appearing in the earlier generations and many kinds of undesirable characteristics brought from tropical varieties made difficult the then breeding procedure by straight crossing, far beyond the ability of breeders.

First successful result was obtained by the late S. Iwatsuki of Aichi Prefectural Agricultural Experiment Station, who challenged this difficulty and devoted himself to the breeding of blast resistance. He marked the high resistance shown by Senshō, Formosan upland rice variety which was said to be introduced by a soldier after Sino-Japanese War in 1893–4, and the first memorial crossing was made with Kinai-Ban 33 in 1922, which was also hybrids by his hand. To overcome sterility, discard characteristics of upland rice type, and enhance yielding capacity, he adopted unique multiple crossing, and after the efforts for near 20 years, he got new