

International Symposium on Problems of Insect Pest Management in Developing Countries

Sponsored by
Tropical Agriculture Research Center, Ministry of Agriculture, Forestry and Fisheries
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The regular TARC international symposium which was held at the Kyoto University Alumni Hall on August 6-7, 1980, in conjunction with the 16th International Congress of Entomology had the theme "Problems of Insect Pest Management in Developing Countries."

The objective of the present symposium was to exchange the latest information on integrated pest control problems with regard to the development and implementation of national programs on integrated pest management so as to reduce the over-dependence on chemical control.

Researchers from Southeast Asia and FAO staff of Bangkok Regional Office were invited to discuss the recent insect pest control problems in their respective countries at the symposium. All the participants attended the International Congress of Entomology, as well.

During the symposium, fundamental discus-

sion and comments were exchanged on each presentation. The program of the symposium and the name of the speakers are listed below:

Opening address

Shiro Okabe

Director, Tropical Agriculture Research Center

Welcome address

Ryoichi Kawashima

Director-General, Secretariat of Agriculture, Forestry and Fisheries Research Council

Presentations

Insect pests of paddy in Malaysia

Poon-Min Chang (Malaysia)

Integrated insect pest management for rice in Japan

Keizi Kiritani (Japan)

Current program of control of rice pests and diseases in Indonesia

Sadji Partoatmodjo (Indonesia)

Insect pest management in rice

Fernando F. Sanchez (Philippines)

Major rice insect pests and their management in Thailand

Tanongchit Wongsiri (Thailand)

Rice pests and their management in Sri Lanka

Nallini Wickremasinghe (Sri Lanka)

Integrated pest management: an overview, Asia and the Pacific region

D. Bap Reddy (FAO)

Effect of citrus red mite infestation on fruit quality, yield and trunk growth of Satsuma mandarin

Yoshio Matsunaga (Japan)

Regional differences in the feeding damage caused by the green rice leafhopper to paddy rice in Japan

Kunihiko Naba (Japan)

The present status of cocoa bee bug, *Platygomiriodes apiformis* Ghauri, in

Sabah and its life cycle study

Pang Tshung Chee (Malaysia)

Disruption of sex pheromone communication in the rice stem borer moth, *Chilo suppressalis* Walker (Lepidoptera:Pyralidae), with sex pheromone components and their related analogues

Hiroo Kanno (Japan)

Constraints to the implementation of integrated pest control of paddy insect pests in Malaysia

Poon-Min Chang (Malaysia)

Control threshold for the rice leaf beetle, *Oulema oryzae* Kuwayama

Akio Kojima (Japan)

Problems of implementation of insect pest management for rural communities in Indonesia

Sadji Partoatmodjo (Indonesia)

Implementation and techniques of insect pest management of sugarcane in Okinawa

Nobuhiko Hokyo (Japan)

Integrated rice pest control in Thailand

Tanongchit Wongsiri (Thailand)

General discussion

Concluding Remarks

Toshikazu Iwata

Each session will be briefly reviewed as follows.

Country reports

Priority and potential rice insect pests were identified and successful implementation of the national program on integrated rice insect pest control in Indonesia, Malaysia, Philippines, Sri Lanka, Thailand and Japan were introduced. It is expected that insecticide applications will continue to be promoted along with the increase of insect pest problems. Accordingly, over-reliance on any single factor of control, insecticides in particular, should be substituted for integrated pest control. Pest management systems developed for temperate countries cannot be directly applied to the tropical conditions. However, the most appropriate components in integrated pest control would be the planting of resistant varieties, shifting of planting date, regulation of paddy water level, destruction of contaminated stubbles, utilization of natural mortality factors, and judicious application of insecticides.

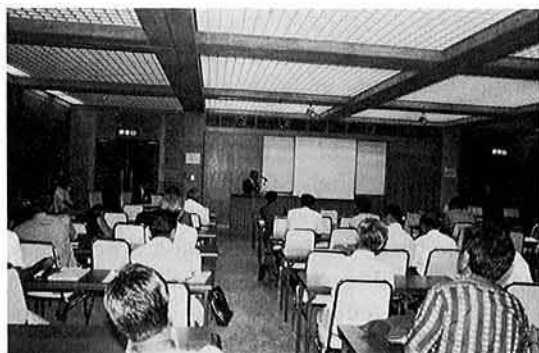
Technical reports

1) Surveillance and forecasting

Female sex pheromones have recently been considered in the hope that they would be of value as an important component of integrated pest control. Thus, evidence of considerable disruption of male orientation to female was demonstrated in the case of the rice stem borer in field and laboratory tests. Among several compounds, Z-11-HDAL and Z-5-HD were found to be most effective not only as disruptors of male orientation but also as inhibitors of mating. It appears that Z-5-HD could be used in practice because of its chemical stability and simplicity of its synthesis.

2) *Economic injury levels*

Precise yield loss assessment is an important component in the planning of adequate control measures. In this connection, a biometric approach was presented to evaluate the tolerance limit of mandarin to citrus red mite infestation, taking into account the fruit quality and growth of tree trunk. Subsequently, a mathematical model was established to simulate the tolerance limit of mite injury. Loss assessment due to feeding damage by the green rice leafhopper was reviewed, and local differences in the degree of feeding damage were ascribed not only to the abundance of the green rice leafhopper but also to the physiological growing process of rice plants based on early-, medium-, and late-maturation. The results suggested that the early-maturing rice variety was likely to be adversely affected by feeding of the green rice leafhopper. The cocoa bee bug appears to limit considerably cocoa production in West Malaysia, considering the present rate of development of the cocoa industry. The distribution, morphology, ecology and life-cycle of the cocoa bee bug were clarified. At present, the damage is not extensive because of the relatively low population of the bug. However, monitoring of the population and loss assessment will be needed for adequate insecticide applications whenever the population is considered to be high.



3) *Implementation and techniques*

There are many problems in the process of development and implementation of an integrated pest control program. The constraints

experienced were discussed by the delegates of several countries. In Malaysia, the national integrated rice pest control program, a systematic and rational approach to rice protection as a substitute for insecticidal control, has been designed but found to be far from ideal. It was also recognized that the lack of basic/applied research information, functional structure, qualified staff, and adequate control measures were major constraints. Damage of rice plants in relation to the life-cycle of the rice leaf beetle, which is the rice pest consuming the largest quantity of insecticides in northern Japan, as well as the relationship between injury level and yield loss, monitoring of population change, and practical sample size were described. Thus a precise control threshold could be established on the basis of the number of eggs and immigrant adults. In Indonesia, it appears that crop rotation, simultaneous planting, use of resistant varieties and timely insecticide applications could help to maintain rice pest populations below the economic injury level. Yet, practical problems, such as the lack of basic research works and the difficulty to make the measures understood by the farmers, remain to be solved. In Thailand food chain relationships among major rice pests and their natural enemies have been demonstrated with emphasis placed on the importance of spiders, dragonflies, damselflies, longhorn grasshoppers, and egg parasites as natural control agents. The significance of the preservation of wild vegetation for both pests and natural enemies was stressed. Evidence was presented that chironomid outbreaks may weaken the activities of predators and that chironomids are a very important source of food for some insects, hence their contribution to the conservation of the population of natural enemies. The utilization of natural enemies, sound cultural methods, resistant varieties, and insecticides are at the basis of the integrated rice pest control program implemented in Thailand. On the other hand the relationship between the incidence of pests of sugarcane which are of economic importance and ratoon culture was defined. It was found that ratoon culture of

summer-planting sugarcane was the major cause of severe infestations by sugarcane pests in Okinawa. However, the important role of wild host plants in pest population dynamics, and the control of pests by means of artificial trashing and leaf-burning at the time of harvest were clearly demonstrated.

It is evident that the pest situation is changing rapidly and assumes alarming proportions as a result of the application of modern cropping systems. Research and experience have demonstrated that over-dependence on a single control strategy such as conventional insecticide application is likely to fail in the

long run, eventually causing serious production losses. Outbreaks of pests have been noted unexpectedly, and the development of insecticide-resistant pests has been along with the problems of accumulation of insecticide residues and their harmful effect on the agroecosystem. Thus, the adoption of crop protection practices which are safer, more effective, and have a more permanent effect has to be promoted through the combined use of all suitable methods in as compatible a manner as possible to reduce pest populations on the basis of economic and ecological considerations.