

International Symposium on Methods of Crop Breeding

Sponsored by

Tropical Agriculture Research Center, Ministry of Agriculture and Forestry

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The objective of the Symposium was to exchange the latest information on plant breeding technologies which have been exploited and developed for the past few years and to enhance interantional cooperation for advancing crop production particularly in tropical countries.

Plant genetics has made enormous progress and changed concepts and methodologies of agriculture. Until recently, plant breeders have been chiefly concerned with total crop performance and could seldom spend much time analysing single gene effects. They have concentrated their effort on quantitative methods to deal with the total effects of many genes using sometimes single plant but more often populations as their basic units of experimentation. Consequently for the last two decades, considerable progress in population genetics and statistical genetics has been made and a lot of attention has been paid to evaluate selection effects. Generation advancement in both plants and animals was regarded as an

important technique to carry out selection effectively. A lot of attention was also paid to increase the resistance to pests and diseases and also to increase nutritional values such as protein and fat contents of the products through conventional breeding methods using individuals and populations.

On the other hand, new techniques of plant genetics such as anther culture, tissue culture and chromosomal engineering are now becoming popular among plant geneticists in some areas. These techniques could become a major avenue for new species building along the development of higher resistance to environmental stresses and for improvement of yields and nutritional values of major food crops. We should expect greater opportunities for improving plant resources by utilizing these new *in vitro* culture techniques coupled with selected crosses among broad genetic materials.

In spite of the great potential offered by new technologies in plant breeding, the major



problem in applying new concepts and methods to increase crop yield is the technology gap between plant genetics, physiology, and biochemistry on the one hand, and plant breeding on the other.

The need for bridging this gap so as to further increase crop yield, hence food production in the developing countries of the tropics was highlighted in the papers presented at this Symposium along with the emphasis placed on international cooperation which is a prerequisite to attain such objective.

Eleven scientists from abroad and 11 Japanese specialists were invited to speak on their respective specialization of breeding methods. Over 100 scientists, research personnel and experts attended the Symposium. The program of the Symposium and the name of the speakers are listed as follows:

Masashi Kobayashi (Japan)

Sweet potato breeding method using wild relatives in Japan

Kazuo Kawano (CIAT)

Genetic improvement of Cassava (*Manihot esculenta* Crantz) for productivity

Isao Tarumoto (Japan)

Forage sorghum breeding by using male-sterile lines

J. Thuljaram Rao (India)

Methods in sugarcane breeding

Tadao Oinuma (Japan)

Tobacco breeding by anther culture

Hiroshi Fujimaki (Japan)

New techniques in backcross breeding for rice improvement

Gurdev S. Khush (IRRI)

Breeding methods and procedures employed at IRRI for developing rice germ plasm with multiple resistance to diseases and insects

Masahiro Nakagahra (Japan)

The origin, differentiation and classification of cultivated rice (*Oryza sativa* L.) by isozyme analysis

Fumio Kikuchi (Japan)

Acceleration methods for generation advancement in hybrid populations of rice

Chai Prechachat (Thailand)

Breeding deep water rice in Thailand

S. M. H. Zaman (Bangladesh)

Deep-water rice in Bangladesh

Kiyoharu Oono (Japan)

Test tube breeding of rice by tissue culture

Arwooth Na Lampang (Thailand)

Breeding soybeans in Thailand

Dolores A. Ramirez (Philippines)

Breeding methods in legume crops

Koichiro Mukade (Japan)

Chromosome engineering and acceleration of generation advancement in breeding rust resistant wheat

Kunio Yamakawa (Japan)

Breeding of disease resistant tomatoes in Japan

S. Kulasegaram (Sri Lanka)

Progress in tea breeding

Jorge Soria (CATIE)

The breeding of cacao (*Theobroma cacao* L.)

S. C. Ooi (Malaysia)

The breeding of oil palms in Malaysia

Toshio Shiga (Japan)

Breeding for fatty acid composition of oil in rapeseed, *Brassica napus* L.

Juan T. Carlos, Jr. et al. (Philippines)

The philosophy and strategies in coconut varietal development and seed production at UPLB

Akira Yamaguchi (Japan)

Virus free materials in fruit trees

Kenkichi Sakai

Closing Remarks