

Profiles of CFC-Member Countries

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PHILSURIN Update (Official PHILSURIN Newsletter)

BSRI

Accelerating Bangladesh's sugarcane R&D program

The sugar industry plays a vital role in the economy of Bangladesh, generating employment opportunities for millions of farm workers. Over 425,000 acres of land is dedicated to sugar, with 60% of the growers owning an average area of 10 acres each. Muscovado sugar or gur is planted to almost half of the sugar lands.

As with other enterprises, the country's sugar industry relies heavily on research and development to remain efficient and globally competitive. Mandated to carry out R&D for sugarcane, the Bangladesh Sugarcane Research Institute originated from the Sugar Research Station which was established under the Department of Agriculture in 1951.

The station was transferred to the Ministry of Industry in 1973. It was then upgraded as the Sugarcane Research Institute, and subsequently renamed Bangladesh Sugarcane Research and Training Institute. In 1989, it was transferred back to the Ministry of Agriculture. The Parliament of the People's Republic of Bangladesh passed the 1996 Act of Bangladesh Sugarcane Research Institute, making BSRI an autonomous national institute.

The institute's breeding program seeks to develop higher yielding and drought-tolerant varieties of sugarcane. It has released a total of 28 varieties, most outstanding of which are Isd-1/53, Isd-2/54 and Isd-5/55.

Hybridization takes place from November to December. BSRI is equipped with a biparental shed with panels of fiberglass that work as separators for each pair of crosses, as well as a canal with flowing water to maintain the marcotted crosses. The institute makes 600 crosses from 140 parents on the average.

The technology transfer of basic sugarcane cultural practices, small machines development and improvement in gur processing, and intercropping from BSRI's other tasks. The institute also has standardized fertilizer doses and management practices for sugarcane cultivation based on agro-ecological zones.

Ten departments constitute the research body, namely Agricultural Engineering, Agricultural Economics, Breeding, Agronomy and Farm Systems, Entomology, On-farm Research, Pathology, Physiology and Sugar Chemistry, Soils and Nutrition, and Training and Technology Transfer. Working to elevate the country's sugarcane R&D program are 368 scientists and technical staff.

Located at Ishurdi, the institute has 3 regional stations, 6 sub-stations, 8 pre-evaluation sites and 8 photoperiod chambers. Equipped with a small-capacity hot water treatment tank and a glass house, the quarantine stations is located at the Dhaka-based Bangladesh Research Institute.

BSRI has accumulated over 1,000 sugarcane accessions mostly from germplasm exchanges with India. Most of the commercial varieties, however, have local varieties as parents.

Project Coordinator Dr. ATM Saleh Uddin Choudhury leads BSRI's delegation to the CFC/ISO/20 project.

ISRI

Working toward self-sufficiency in Indonesia

The oldest sugarcane research institute in Asia, the Indonesian Sugar Research Institute was established in 1887 by the Indonesian Planters Association.

A government agency under the Ministry of Agriculture, ISRI is a sugarcane breeding pioneer in Asia. Two of the most enduring varieties ever developed in the region, POJ 2878 and POJ 3016, were bred in ISRI. Today, the quest for higher yielding varieties still remains to be the institute's major task.

ISRI Principal Sugarcane Breeder Dr. Mirzawan P.D. Nurtjahjo says he is hopeful that through CFC/ISO/20, they will be able to develop high yielding varieties that may be commercially grown in Indonesia. He added that these HYVs would help increase the country's productivity and improve the lives of sugarcane farm workers.

Located in Pasuruan, ISRI provides services related to agricultural technology, production equipment, waste treatment technology, as well as processing technology. It also conducts research on sugar processing in its own mini sugar factory.

Among key studies conducted on sugarcane were the production of dextranase enzyme, the desugarization of molasses, the production of Maillaerd-Reaction Products to inhibit microbial activities, and serodiagnosis for the early detection of smut. The institute is composed of over 400 men and women sugarcane experts manning 8 various divisions – Agronomy, Agricultural Engineering, Breeding, By-products, Plant Protection, Processing, Soil Science and Socio-economics.

Occupying 70 hectares of land, ISRI's breeding station is equipped with facilities for biotechnology, sugarcane seed storage, cane juice and sugar analysis. Its tissue culture laboratory produces more than 200,000 sugarcane plantlets annually.

Over 6,000 hybrid clones comprise the institute's rich germplasm collection, 767 of which are wild canes. The sugarcane accessions have been accumulated through an active germplasm exchange program with breeding stations in Australia, Barbados, Hawaii, India, Japan, and the United States.

ISRI has a quarantine station found at the Puteran Island in Madura, East Java, 100 kilometers away from the nearest sugarcane plantation. It has 11 experiment sub-stations. A cane crossing facility is located in Malang.

Sugar is among Indonesia's primary commodities. In 2000, the country's sugar production was 1.6 million tons, while domestic consumption was 3 million tons. Indonesia imports sugar from various countries, with Thailand as the largest supplier. Sugarcane production increased to 2.031 million tons in 2004, with consumption at 3.4 million tons.

In 2002, the government launched a productivity enhancement program to achieve self-sufficiency in sugar production by 2008. The program is aimed at upgrading outmoded sugar mills, encouraging replanting, and expanding sugarcane cultivation to the outer Java islands. The country is also working to improve farm practices and distribute more HYVs.

Project Coordinator Dr. Nurtjahjo and Deputy Project Coordinator Ir. Abdul Rasyid, MM lead Indonesia's contingent to the CFC/ISO/20 project.

MARDITECH

Bringing innovations to Malaysia's sugar industry

After having developed modern biotechnologies and other innovations for the agriculture industry, the next challenge is to bring these products and services closer to end-users.

In the case of Malaysia's sugar industry, research results reach sugar producers through Marcitech Corporation Sdn. Bhd. A wholly-owned subsidiary of the Malaysian Agricultural Research Development Institute (MARDI), Marditech was incorporated in 1992 to help accelerate the industry's uptake of research results.

While MARDI undertakes R&D in food and tropical agriculture, Marditech facilitates the transfer of technological innovation and imparts professional management experience to develop successful agro-based businesses. Its major tasks include marketing MARDI's know-how and expertise, providing a platform for integrating R&D results and industry needs, and developing capacity as an integrator for technology innovation initiatives.

Marditech links MARDI with entrepreneurs who want to invest in commercializing technologies developed by the R&D institute. Technology and innovation, business strategy, technology investment, and technology marketing are its core competencies.

To implement a variety exchange program, it brought together MARDI and Gula Padang Terap, a government-owned sugar production complex in Alor Setar. One of two sugar mills in Malaysia, Gula Padang Terap has a milling capacity of 4,500 tons cane per day.

With a pool of over 430 scientists and researchers and more than 1,000 technicians, MARDI will take charge of nursery establishment, disease screening and indexing, laboratory analysis, database management and variety evaluation. It will also provide quarantine facilities.

Varieties for exchange, harvesting, variety performance and evaluation, as well as the facilities for field trials will come from Gula Padang Terap which employs over 600 workers.

Marditech's role in the partnership involves the management of the project, the coordination of the services needed, the mobilization of funds, the procurement of goods, logistics, project accounting and auditing, and project report and evaluation.

Well-coordinated programs such as this will surely improve the productivity and competitiveness of Malaysia's sugar industry.

Project Coordinator Dr. Ali Abdul Hamid and Deputy Project Coordinator Zaritadul Addawiyah Murid lead Marditech's representatives to the CFC/ISO/20 project.

PHILSURIN

A key player in Philippine sugar's dramatic recovery

Chosen to be the project executing agency of the CFC/ISO/20: Sugarcane Variety Improvement in Southeast Asia and the Pacific project, the Philippine Sugar Research Institute Foundation, Inc. is the sugar industry's research and development arm.

PHILSURIN was formed in response to Executive Order No. 18 mandating that sugar research, development and extension activities be transferred to the private sector. The institute is funded by sugar millers' and planters' liens at P2 per 50-kilogram bag of sugar produced, as mandated by Sugar Regulatory Administration Sugar Order No. 2 Series of 1995.

The non-stock, non-profit organization works in tandem with the SRA and the Institute of Plant Breeding – University of the Philippines Los Banos to sustain the country's self-sufficiency in sugar, as well as to keep abreast of the latest thrusts in biotechnology for sugarcane breeding.

The secret behind Philippine sugar's success, PHILSURIN Director General Leon Arceo says, is the active involvement of stakeholders in the Mill District Development Councils which have undertaken the massive distribution of new high yielding sugarcane varieties. Manned by men and women coordinators who have a track record of excellence in the fields of agriculture, agronomy, plant pathology and plant physiology, MDDCs define their own problems, decide which projects to prioritize, outline methodologies and craft solutions that would best address their needs.

PHILSURIN has institutionalized a total of 26 MDDCs across Luzon, Visayas and Mindanao. The propagation and dispersal of high yielding sugarcane varieties, variety testing, disease prevention, pest control, soil rejuvenation, publications, as well as seminars and farm tours, from the MDDCs' roster of activities.

The search for higher yielding varieties of sugarcane is the institution's most important, and most expensive activity. PHILSURIN took over the Victorias Milling Corporation Breeding Station in 1997 and funds the breeding activities, the equipment and the professional expertise of a staff of 17. Working and greenhouses, nurseries and state-of-the-art laboratories, the breeders follow a seven-year breeding cycle, evaluating earlier VMC crosses and the more current PRN (PHILSURIN) crosses.

Senior Plant Breeder Aurora Barredo says that "Our breeding program seeks to develop location-specific varieties that are high in sugar yield, erect, self-trashing and resistant to major diseases."

Between 1967 to 1997, the VMC Breeding Station released 10 high yielding sugarcane varieties. PHILSURIN released 7 high yielding sugarcane varieties including VMC 86-550, PS 2 (VMC 88-354), PS 3 (VMC 84-524) and VMC 87-599 between 1997 and 2002. In addition, the institute has recently made available to a number of milling districts 2 new HYVs: PS 4 (VMC 95-152) and PS 5 (VMC 95-09). The SRA also has registered its own 7 HYVs.

The station has a germplasm bank of 1,000 sugarcane accessions accumulated since 1967. A duplicate germplasm collection is kept at the IPB-UPLB.

Faced with the increasing prices of fertilizer, labor, as well as fuel, the Philippine sugar sector has turned to modern biotechnologies for a much-needed boost. PHILSURIN has gone beyond conventional breeding

methods, conducting research in molecular marker technology that will eventually shorten the breeding cycle.

Partnerships with international research and development organizations such as the United States Department of Agriculture, the Agricultural Research Centre for International Development of France, the Bureau of Sugar Experiment Station of Australia, the Yunan Sugarcane Research Institute of China, and Mitr Phol of Thailand have helped shaped the country's R&D program. PHILSURIN is also part of the International Consortium of Sugarcane Biotechnology and the International Sugarcane Microsatellite Consortium. The Philippines further banks on its growing number of sugar experts to sustain advances made in biotechnology.

From the downturn in the 80s to the mid 90s, PHILSURIN has been material in the sugar industry's dramatic recovery. Production grew by 43.55% from 1.63 million metric tons in 1999, to 2.34 million metric ton in crop year 2003-04. The hefty increase has made the Philippines a net sugar exporter, selling its surplus to China, Japan and South Korea.

Leading the Philippines' representatives to the regional variety improvement program are CFC/ISO/20 Project Manager Leon Arceo and Deputy Director Project Manager Dr. Ramon Cu.

OCSB

Overseeing Thailand's sugar industry

Thailand began producing sugar as early as the 13th century. From a cottage industry, sugar production grew and shifted to commercial scales. In 1960, the country achieved a net sugar export status. Today, it is one of the world's 5 largest sugar exporters, selling sugar to Africa, China, Indonesia, Japan, Korea, and Malaysia.

Established by the Cane and Sugar Act of 1984, the Office of the Cane and Sugar Board was created to regulate Thailand's sugar industry. It is an agency under the Ministry of Industry which oversees the research, extension, as well as policy making aspects of sugar.

The organization is composed of 4 major committees. The Executive Committee determines the final sugar prices and returns on sugar production and distribution. The preparation of plans for the development of sugarcane varieties, sugarcane production, the control of pests, and the registration of cane growers fall under the Cane Committee.

The Sugar Committee takes charge of production planning, determining the amount of cane to be crushed daily, the regular rate for crushing for each factory, and the types, quality and quantity of sugar that each factory will produce. The task of collecting sugarcane and sugar research development fees is the Cane and Sugar Stabilization Fund Management Committee's responsibility.

Through its various activities, the OCSB seeks to increase the country's volume and quality of sugar production, further expand the market, and provide technical know-how of Thailand's sugar workers.

The OCSB also takes charge of dividing Thailand's sugar output into 3 quotas – quota A is for domestic sales, quota B for exports under the industry's long-term contracts, and quota C for exports falling under individual export contracts.

Under the Cane Committee is the Central Sugarcane Agricultural Center which is divided into 4 sections - Agricultural, Angthong Sugarcane Station, General Administration, and Science. Sugarcane breeding and selection are undertaken by the Agricultural and Angthong Sugarcane Station sections.

The Central Sugarcane Agricultural Center in Kanchanaburi, and the Angthong Sugarcane Station have a total staff of over a hundred. Sugarcane Variety Improvement, Soil and Fertilizer, Cultural Practices, and Pests and Diseases form the station's various departments.

The station has a germplasm bank of 500 sugarcane accessions accumulated through variety exchange with sugarcane breeding institutions in China, Indonesia, and the Philippines.

Leading Thailand's representatives to the CFC/ISO/20 program are Project Manager Suttinee Poopaka and Deputy Project Manager Warawan Chiparoon.