

Key lies in biotech-driven agri sector

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KOTA KINABALU: The agriculture sector's contribution to the nation's economy in the past has been eclipsed by other sectors such as manufacturing, petroleum, tourism and production industries.

This is despite agriculture remaining the main pillar of Malaysia's economy since her independence.

"The relatively sluggish growth of agriculture and food industries in Malaysia has resulted in growing food imports and food insecurity," said Universiti Malaysia Sabah (UMS) Vice Chancellor, Prof Datuk Mohd Noh Dalimin.

He said obstacles like acute labour shortage; limited availability of suitable land for agriculture; weather conditions that limit the variety of plants that can be cultivated; increasing production cost arising from inter-sectoral demand for resources; and an increasing call to stop destroying natural forests and converting them into monoculture plantations, are among the factors contributing to this scenario.

This has consequently resulted in a high import bill for Malaysia, he said.

"In 2001, Malaysia's food imports totalled US\$3.2 billion. A high import bill of 21.3 per cent was recorded in 2004 compared to the lower rate of 17.5 per cent for exports of goods," said Mohd Noh.

The urgent need to reduce food imports, increase self-sufficiency and reduce dependency on imports have prompted the Malaysian government to re-examine the importance of the agricultural sector, he added.

"Today, agriculture together with biotechnology will spearhead the country to higher economic growths in the Ninth Malaysia Plan (2006-2010). In line with this and through various funding agencies, the government has allocated a large sum of funds for agro-based research and development to advance the agriculture sector," he said.

Mohd Noh was speaking at the official operating of the three-day Third Biotechnology Symposium themed 'Agrobiotechnology: Modernising Agriculture through Molecular Biology' at the Chancellery Building of UMS here Wednesday.

The field of molecular biology makes it possible to transfer useful traits from one organism, like for example plants and food crops, to another, he said.

"The application of molecular techniques enables the isolation and manipulation of genes which can be transferred from one unrelated organism to others, including plants, animals and aquaculture organisms of high economic value.

"This allows them to confer better traits or characteristics such as

higher yielding crops and livestock and increased tolerance towards unfavourable environmental conditions and pests which affect their growth and productivity," he explained.

Such genetically engineered organisms, such as maize, soybean and tomatoes are marketed widely, he said, adding despite the controversies which are usually due to ignorance, lack of awareness and misinformation these organisms have significantly increased productivity which in turn leads to a proportionate increase in income per hectare.

As a university, Mohd Noh said UMS plays an important role in training graduates and to conduct research and development in the field of agrobiotechnology.

He said the Biotechnology Research Institute (BRI) and Borneo Marine Research Institute (BMRI), centres of excellence in UMS, the School of Science and Technology (SST) and the newly-established School of Sustainable Agriculture (SSA) offers academic programmes at the undergraduate and postgraduate levels aimed at producing skilled and knowledgeable personnel for the agriculture and agro-based industries, including aquaculture.

In particular, he said, the programmes offered are Bachelor of Science (Plant Technology, Aquaculture), Bachelor of Agriculture (Crop Production, Horticulture and Landscape, and Livestock Production), and Masters of Science Degree (Molecular Biology), which is expected to begin in July next year.

"In addition, universities also play a crucial role through research and development to train highly skilled human resources, equipped with latest technologies to support the government's initiative to strengthen the field of agriculture," said Mohd Noh.

According to him, agro-based research at the UMS is carried out in focussed areas, namely, crop improvement and post harvest technologies (for pineapples, paddy, oil palm, ginger, fruits, highland vegetables and seaweed) and livestock and meat production of goats, shrimp aquaculture and ranching of sea cucumbers.

Molecular biology research, specifically at the BRI focuses on the identification of molecular markers for specific genes of economic interest, the identification of disease-resistant genes and promoters, the application of transgenic technology through gene cloning and transfer, the cloning and characterisation of new promoters, genes, enhancers and terminators for plant transformation.

The expected outcomes of these research are disease and insect resistant crop varieties and animal stocks, high-yielding cultivars, prolonged shelf-life of fruits and vegetables, improved fruit quality and development of molecular kits for diagnostics and as biosensors.