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M'sia has a few seed centres

WE read with interest the IKIM Views article "Banking our biodiversity for the future" (*The Star*, April 14) by Prof Datin Dr Azizan Baharuddin.

Malaysia has established several centres focusing on different types of seeds such as:

> Forestry species (Lentang Seed Centre, Pahang and Semenggoh Seed Centre, Sarawak), with the support of well-equipped seed technology laboratories at the Forest Research Instute of Malaysia (FRIM) and Forest Research Centre (FRC), Sabah; and

> Padi seeds under the Malaysian Agricultural Research and Development Institute (Mardi) established in 1979.

We realised the need to secure forestry seeds long ago. It started in 1925 when the Forest Research Institute (FRI) was assigned to establish, reforest, rehabilitate and restore forest plantations with planting materials.

But flowering-fruiting of forest trees was reported in 1932 by Dr F. W. Foxworthy to be irregular and unpredictable in Malaysia, a phenomenon first observed by H. N. Ridley in 1901.

This has hindered the continuous seed supply. Thus, studies on the natural phenomenon of plant behaviour interacting with the environment, called phenology, were conducted to understand forest species behaviour to ensure enough planting material for indigenous plantation forests.

Dipterocarpaceae, a family that dominates our forests, constitutes up to 10% of all tree species and 80% of all emergent individuals. The challenges to secure these seeds are immense.

Mass flowering-fruiting season happens once in three to eight years for a majority of dipterocarp species, while others tend to flower annually. Flowering is dependent on factors such as differences in location, topography, elevation, climate condition, temperature, intense sunshine hours and even genetic response within the same species.

In addition, the right seed maturity must be identified. The right collection techniques, seed handling method, processing as well as storage techniques must also be determined to ensure high viability of these seeds before storage.

Based on moisture content that controls the survival rate, seeds are divided into three main categories: orthodox, intermediate and recalcitrant.

Over 70% of our dipterocarp seeds are recalcitrant, i.e. they cannot be stored for long and must be planted immediately.

A majority of fast-growing species are intermediate and orthodox, and those can be stored up to several years. To conserve biodiversity, be it species that are rare, threatened or on the verge of extinction, the aim is to ensure its survival after storage, high viability and genetic stability.

FRIM's Seed Technology Laboratory (*Makmal Teknologi Biji Benih* or MTBB), set up in 1980, has conducted hundreds of experiments to secure good quality seeds.

It is ISO certified to issue seed certification and has all the basic facilities required under International Seed Testing Association (ISTA) guidelines.

It has a computer-aided tree seed bank system to store database of all tests and verifications to ensure only good quality seeds are planted as gestation period for any plantation or forest tree to grow takes over 10 years.

To date, over 50 species and about five million seeds of various sizes are stored in MTBB. Most belong to the orthodox group and species with high value for planting purposes. About 10% of the collections comprise species in the Malaysia Plant Red List (2010). However, seeds of species such as Dipterocarpus sp., *Gonystylus bancanus* (ramin), Hopea sp., *Neobalanocarpus heimii* (chengal), and Shorea sp. show recalcitrant behaviour. Sixty-three dipterocarp species are being monitored in FRIM and of this, 21 are listed as threatened.

MTBB supplies about 200,000 seeds a year to individuals and private companies/agencies throughout Malaysia for planting purposes.

Seeds from herbal species will soon be included. For long-term storage, cryopreservation will continue to be investigated.

Studies on cryopreservation of several endemic and threatened species such as *Lagerstroemia langkawiensis* (bungor) and *Vatica bella* (resak keluang) had been successful.

Many others have been tested and studies are on-going to obtain viable seeds after storage in liquid nitrogen.

As a result of joint efforts by FRIM, Forestry Department Peninsular Malaysia (FDPM) and Forest Department Pahang, the Lentang Seed Centre was initiated in 1995.

FRIM also helped Forest Department Sarawak to set up the Semenggoh Seed Centre. Through this network, these centres aim to procure seeds and produce adequate planting material of various qualities for forest development projects, plantations, replanting, and conservation, as well as for enhancement of forest biodiversity and landscape in Malaysia, among others.

FRIM will continue to strive for the conservation of our forest biodiversity, be it in-situ or ex-situ. We will continue to support FDPM in strengthening the Lentang Seed Centre's collection, handling and storage efforts. In fact, the FRIM campus in Kepong is an important ex-situ conservation site, harbouring 73 threatened species out of 92 on the Malaysia Plant Red List.

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