

# Malaysian Agricultural Research and Development Institute (MARDI), Malaysia

MARDI is a leader in agro-technology, with a growing international reputation for R&D supporting agricultural and bio-based industries that will drive transformation of the food, agriculture and bio-based industries in Malaysia.

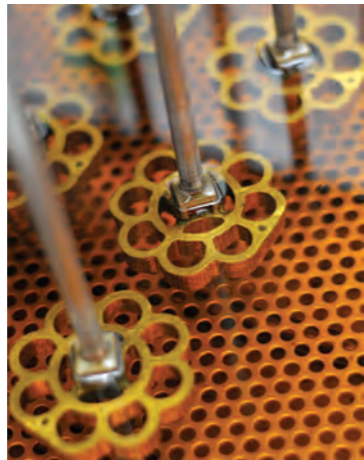
**Achievements** MARDI addresses technical issues and constraints faced by the agricultural industry, as outlined in the National Agro Food Policy and Science and Technology Policy, and works to transfer, as well as commercialise technologies to appropriate users and private sector companies. It has generated some significant basic and applied research findings which have been of considerable benefit to the scientific community, as well as extension agents, private sector companies, farmers and the people of Malaysia.

The adoption of modern farming methods and machinery created by MARDI have increased farmers' income and quality of life. Machinery developed by MARDI includes the rice row seeder, the pineapple transplanter, the coconut dehusker and various other food processing machineries. These have helped a generation of high

income farmers to develop thanks to improved efficiencies and standards.

In terms of Malaysia's overall economy, MARDI is contributing by helping to raise the level of exports and by reducing the country's food bill. Malaysia, with the help of MARDI, has become self-sufficient in several commodities.

Examples of MARDI's discoveries include production of the high yielding rice variety, MR219, which has a potential yield of more than 10 tons per hectare. MR219 is now the most popular rice variety grown in more than 90% of the granary areas in Malaysia. It has been used by farmers for 12 years and has contributed significantly to increase production and food security requirements. A new variety, MR269, was launched by Malaysia's Prime Minister in 2012 as an alternative to MR219, which as well as being high yield is resistant to some major diseases in rice.



**Established** Established in 1969 and began operations in 1971  
**Location** Selangor, Malaysia  
**Population** 3,315 with 585 Research Officers  
**Website** www.mardi.gov.my

**Areas of expertise** Agricultural research, technology development and transfer, technology commercialisation and agricultural competency development.

**33** MARDI has launched 33 rice varieties since 1971 for use by the farmers all over Malaysia.

**280t** MARDI was mandated to produce 280 tons of foundation seeds to be used by seed producers for development of certified seeds for farmers. Popular varieties are MR219, MR84 and MR220.

**22** Around 22 Intellectual Properties (IPs) are generated by MARDI annually.

MARDI has also developed bio-sensor technology for rapid and accurate detection of contaminants in foodstuff, for example hazardous chemicals, microorganisms, heavy metals, aflatoxins and genetically modified organisms. The detection kit is able to determine the presence of contaminants in less than one hour at very low concentration parts per million. This technology has been licensed for detection of chemical pesticides in fresh fruits and vegetables and is in the process of being licensed for other environments.

Precision farming in large-scale farming has been another area of investigation for MARDI. It includes a range of activities. In rice farming, detection methods have been used to determine the exact nutrient requirements for rice cultivation, based on the actual needs of the plant as well as on the nutrient status of the soil. Detection technology has also been used to determine efficient and optimum use of fertilisers and pesticides. Unmanned aerial vehicles have been used to collect satellite images that reveal whether rice areas are infested by diseases.

MARDI has also developed several bio-based products such as biofertiliser, biopesticides and bioherbicides which are effective in enhancing plant growth and development and are environmentally friendly alternatives to chemical products. To date the institute has commercialised "Genkimo", a product derived from efficient microbes for the production of biofertiliser, removal of foul odour and housefly repellent. It has also commercialised NPV, a virus-based biopesticide which controls the infestation of army worm in cabbage. MARDI established research stations in Mali (1990) and Malawi (2004) in order to further their research and development in Africa.

**Success factors** MARDI lists several reasons for its success in becoming a highly respected R&D institution in Malaysia and the region. First and foremost, it points to its knowledge-based culture and the emphasis placed on continuous learning. This has helped MARDI ensure its science-based knowledge, products and services are responsive to market needs.

## Prize category 1

The institute creates and maintains international linkages with universities, research institutions, organisations and associations. It also maintains excellent relationships with the private sector and local small- and medium-scale entrepreneurs.

Adequate funding to sustain R&D activities and to develop infra- and info-structural support has also been fundamental to MARDI achieving its aims. The private sector provides funding to MARDI in the form of contract research to solve specific issues over a given period. Financial support is also provided by the government for R&D, operational and infrastructure programmes and for graduate study and training courses in specific areas proposed by research officers.

**Future plans** In line with its commitment to the food, agriculture and bio-based industries in Malaysia, MARDI is focused on creating new knowledge and commercially viable technologies, alongside providing effective services for its customers.

MARDI wants to attain greater international visibility through scientific research and is also pursuing further operational excellence. To support these aims it is investing in the development of state-of-the-art physical and technical infrastructure, including the development of a motivated, competent and productive knowledge-based workforce.

**The IDB Prize** MARDI's reputation was greatly enhanced on receipt of the IDB Prize. The Prize also increased the reputation and morale of MARDI's researchers, with teams feeling proud of their contribution to technology generation and recognised for their achievements. With greater visibility, MARDI acquired additional interest in its technical and consultancy services amongst both local and international institutions. It used the Prize money to acquire software used by its research officers for managing knowledge and innovation.

