

Feeding the masses

A Dutch seed company expects innovations will help vegetables to flourish in Thailand.

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How to feed 2 billion extra people projected over the next two decades is a challenge for the global food industry.



Coated and primed seeds show better uniformity of germination after seven days. Photos by WALAILAK KEERATIPATPONG

Some countries opt for the use of genetically modified organisms to improve crop yields, but GMO food remains controversial because of the uncertain risk to health and questions about the nutritional benefits.

Several manufacturers have developed various innovations for plants and seeds to increase productivity as well as guard against any hazards from climate change.

For example, the Netherlands-based East-West Seed, a market leader in tropical vegetable seeds, now offers new primed and pelleted seeds.

Seed priming is a technique that increases the uniformity of germination and shortens the time it takes for seedlings to emerge from the soil. Pelletting is a creative technique to change seed's size and shape for improved plantability, especially for small and irregularly shaped seeds. Coated seeds in a variety of colours were also introduced.

Seed coating is a process designed to create a healthy and protective environment for the germinating seed in its critical early stages of development.

Bert van der Feltz, senior vice-president of East-West Seed Group, said the innovations would benefit farmers by leading to higher productivity and better resistance to pests and diseases.

The technology has largely been used in Western countries and was just recently brought to India, the Philippines and Thailand.

Hybrid seeds are still small potatoes compared to conventional seeds, of which farmers keep some after harvesting, resulting in low productivity and poor resistance to new threats.

The supply of rice seed supplies by the government each year is only 10% of total demand, approximately 1 million tonnes a year.

"With the amount of plantation land decreasing and demand for food crops increasing, more research and development is necessary," said Mr van der Feltz.

Innovation has been the core of East-West Seed's growth the past 30 years in Thailand. The company sets aside 15% of turnover yearly for R&D, mainly on the tropical seed industry.

Its research house in San Sai district in Chiang Mai develops an average of 25 new varieties per year on top of about 300 varieties of over 40 vegetables, crops and flowers.

East-West Seed's first hybrid variety, bitter melon Sae Yid 71, was developed from Thai varieties collected from Ratchaburi crossed with strong Philippine lines.

DNA marker technology has been used in plant breeding to ensure reliability in selecting proper genes, because it is not always possible to select reliably and consistently for resistance under field conditions.

These bio-experiments are sometimes difficult. It is often hard to combine multiple-resistance genes for the same disease, so the DNA marker is the solution.



Darush Struss in front of the firm's cutting edge PCR

Double-haploid technology provides additional benefits to speed up variety development and improve efficiencies in order to select the needed combination of genes.

The company's 60-million-baht research centre opened four years ago allows 20 breeders to improve seed varieties for both the domestic market and exports. The centre has a machine that uses single-nucleotide polymorphism technology to help select the best quality seeds.

Darush Struss, manager of biotechnology & molecular plant breeding for East-West Seed, said the technology helps read 50,000 lines of genetic code per time, far higher than most machines used in Thailand that read only hundreds of lines of code.

DNA tests using PCR (Polymerase Chain Reaction) allow 250,000 tests every 90 minutes, compared with about 360 samples by conventional PCR machines, he added.

"It could shorten the time needed to discover a new hybrid variety seed from seven to eight years to only three to five years," said Mr Darush.

East-West is the only company in Asia using the 26-million-baht machine developed and manufactured by Douglas Scientific in the US.



Seeds being primed and coated.

machine, the only one in Asia.

Mr van der Feltz said technologies utilised in making premium seeds for farming have largely been used in developed countries, notably the Netherlands. Though it is a small country at 33,800 square kilometres, it is a leading exporter of agricultural produce on the continent.

"Farmers in Holland are normally rich, so the occupation is popular," said Mr van der Feltz.

Asia has the most farmers in the world, but many of them are small farmers, including in Thailand, where most are engaged in field crops.

Of the 133 million rai of farming area in Thailand, only 3.5 million rai is for vegetables, reflecting the low vegetable consumption of Thais, at 180-185 grammes a day compared with a global average of 400-500 grammes.

But the company believes vegetable farming has a promising outlook thanks to more health-conscious consumers learning to eat more fruit and vegetables.

Vegetable farming would be more profitable if farmers use quality seeds and utilise better farm management, he said.

East-West Seed now operates 12 R&D stations in seven countries, producing about 1,500 tonnes of various vegetables, flowers and crops for sale under the Sorndaeng brand. It has a 35% share of the 2 billion baht tropical vegetable seed market in Thailand.



Bert van der Feltz shows off some of the fruits of his company's labours at East-West Seed's demonstration farm in Chiang Mai.

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