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Report Highlights:

On May 22, 2025, FAS Jakarta organized the Indonesia Agricultural Biotechnology Showcase highlighting to Government of Indonesia (GOI) officials, university students, and other stakeholders Indonesia's advances in the field of agricultural biotechnology. Indonesia is one of 32 countries in the world cultivating genetically engineered (GE) crops; however, new innovative products face a costly and interrupted approval processes that, if streamlined and made more efficient, can help Indonesia increase its biotechnology research, development, and production potential. Moreover, U.S. soybean and other GE product exports to Indonesia, valued at $1.75 billion in 2024, risk facing increased regulatory burdens without overall GOI support for biotechnology.

Indonesia is a Regional Leader for GE Cultivation Despite a Costly and Cumbersome Approval Process

Figure 1. CDA Heather Merritt provides opening remarks.

On May 22, 2025, FAS Jakarta organized the Indonesia Agricultural Biotechnology Showcase in collaboration with Indonesia's Biosafety Commission (KKH) with a dozen speakers from all over Indonesia as well as from the United States. The event highlighted Indonesia's advances in the field of agricultural biotechnology to an audience of Government of Indonesia (GOI) officials, university students, and other stakeholders. GOI officials in attendance represented a wide array of government ministries and agencies, including the Ministry of Foreign Affairs, the National Food Agency, the Food and Drug Agency, the Halal Product Assurance Agency, the National Planning Agency, the Ministry of Defense, the National Research and Innovation Agency, and the Ministry of Marine Affairs and Fisheries. The current Prabowo administration has made food security a top priority, and the showcase aimed to demonstrate how domestic and imported products of biotechnology help to improve Indonesia's food security and nutrition.

"Now more than ever, Indonesia is focused on food security, improved agricultural production, and also, of course, nutrition," said U.S. Chargé d'affaires Heather Merritt in her opening remarks. "There are many aspects to improving these areas, from creating more seamless inter and intraregional trade, to modernizing agricultural equipment, to innovating new varieties of crops through the most advanced biotechnology."

Indonesia is one of 32 countries in the world cultivating genetically engineered (GE) crops, and already plants drought tolerant sugarcane, pest resistant and herbicide tolerant corn, and late blight resistant potato. Professor Bambang Sugiharto of the University of Jember presented on the research behind the drought-tolerant sugarcane currently being cultivated in Indonesia. Biotech and Seed Manager for Croplife Indonesia Anandayu Pradita discussed successes and challenges faced by private sector biotech companies in their development of herbicide tolerant and insect resistant corn varieties in Indonesia. To facilitate the development of future biotech products, she recommended the GOI streamline the biosafety

Figure 2. CDA Heather Merritt visits bio granola potato booth with Ag Counselor Lisa Ahramjian.

approval process by creating an online dashboard to make the process transparent, enable up-to-date tracking, and improve the synergy between all GOI agencies involved in the process.

Figure 3. Researchers Panel (Left to Right): Prof. Ibnu Wibono, University of Padjadjaran; Prof. Bambang Sugiharto, University of Jember; Anandayu Pradita, Croplife Indonesia

The late blight resistant potato currently being cultivated in Indonesia, commonly known by Indonesian potato farmers as the bio granola potato, was a collaboration over many years between several U.S. universities, including Michigan State University, and the Ministry of Agriculture and what is now the National Research and Innovation Agency (BRIN). The bio granola potato research started in 2006, but due to a long, multistep approval process, it did not receive full approval by the GOI until 2024. Professor David Douches of Michigan State University (MSU) presented on the long history of this collaboration, stating:

"Our goal is to bring late blight resistant potatoes to the farmers. Late blight is the disease that caused the Irish potato famine over a hundred fifty years ago, and it's still a problem today. We now have the tools to bring an end to late blight, a multi-billion-dollar disease problem worldwide. Here in Indonesia, where conditions are very good for late blight, [farmers] may have to spray [fungicide] 20 or 30 times a year just to control the crop."

Figure 4. Michigan State University Professor David Douches explains the research behind late blight resistant potato varieties.

The current bio granola potato reduces the required amount of fungicide applications by over 50 percent, but MSU and BRIN were working on yet another late blight resistant potato variety with the potential to cut fungicide applications by 90 percent. Professor Douches explained how using biotechnology, researchers were able to take three genes from wild species of potatoes and stack them into one potato, providing it with more robust resistance to late blight disease. "This late blight

Figure 5. Farmers Panel (Left to Right): Dr. Richard Torno (GE corn farmer in the Philippines), Hamzan Wahid (GE corn farmer), Bunyan Ismail (GE potato farmer/seed breeder), Suwarso (GE sugarcane farmer)

potato is a safe product, and it benefits the environment and the community," continued Professor Douches. The stacked genes variety of late blight resistant potato is still under development pending additional funding.

A panel of farmers at the end of the showcase attested to the financial and yield benefits they gained from planting biotechnology. Filipino farmer Dr. Richard Torno of the Canaan Farmers Association virtually joined the farmers panel, showing photos of his GE corn farm and sharing the Filipino farmers' positive experiences with GE corn. Notably, Dr. Tor no mentioned cultivating GE corn enabled him to go from feeding only a handful of cows per hectare to 30-40 cows per hectare, and that a stunning 90 percent of all corn farmers in the Philippines now use GE corn. His family's livelihood improved so much he is now reconsidering sending his son to university. He also expressed his appreciation for the Philippine s government being an early mover on biotechnology acceptance, granting Filipino farmers access to this technology since 2002.

His sentiments were echoed by his Indonesian counterpart on the farmers panel, Hamzan Wadi, who talked about how before using GE corn, his farmers group would have to prepare the land by applying herbicides two to three times before planting and then again one to two times after planting, expending a lot of time and money. But after switching to biotech corn, they reduced herbicide use to once before planting and once after, saving the farmers a lot in labor and fungicide costs. Labor for herbicide spraying costs farmers 1 00,000 to 150,0 00 Indonesian rupiah ($6-$10) per hectare, a significant cost for farmers. "They call it the 4E corn

Figure 6. Indonesian GE corn booth with U.S. snacks made from U.S. GE corn

seeds: time efficient, labor efficient, fertilizer efficient, and cost efficient," said Hamzan. Sugarcane farmer Suwarso, and potato farmer and seed breeder Bunyan Ismail also shared similar experiences with their respective GE products.

Figure 7. KKH Chairman Bambang Prasetya provides overview of biotech approval process.

Two other innovative Indonesian products are in the pipeline but have to undergo a costly and cumbersome approval process es: rapid growth catfish and Golden Rice. Professor Ibnu D. Buwono of the University of Padjadjaran presented on his team's research and development of a transgenic Mutiara catfish over the past 10 years. The catfish, now in its 7th generation of breeding, grows to full market size in one third of the time as conventional catfish, meaning aquaculture farmers would only need to provide one third of the amount of feed normally required, and the catfish would produce two thirds less waste during its life cycle. Professor Buwono has yet to start the long approval process for his GE catfish due to lack of funding. And although the research process for Golden Rice started in 2017, after years of interrupted research due to funding lapses, this biofortified rice is still undergoing various stages of food safety, feed safety, and environmental safety approval processes.

In his welcome remarks at the showcase event, the Chairman of KKH Bambang Prasetya noted the importance of the transparent interagency process to fully approve each GE product in circulation in Indonesia, although there are still many efficiencies to be gained with increased

Figure 8. U.S. Soybean Export Council Nutrition Expert Dr. Dadi Maskar presents on the importance of GE soybeans to Indonesia's fight against malnutrition.

Government of Indonesia support. After describing the current long, convoluted approval process involving many steps at several government agencies, he urged the government officials in the audience to "facilitate regulations to make the process smoother," as that would be aligned with President Prabowo's priority to accelerate Indonesia's food security.

Within the Association of Southeast Asian Nations (ASEAN), Indonesia is behind only the Philippines and Vietnam in terms of biotechnology innovation. With streamlined regulations and increased support and collaboration, Indonesia could become the region's leader in biotechnology acceptance.

Domestic and Imported GE Products Also Support Indonesia's Nutrition Goals

Besides helping farmers achieve higher yields and lower input costs (e.g. pesticides, fungicides), biotechnology can be used to improve consumer nutrition. Dr. Dadi Maskar, a senior lecturer & researcher at Nutrition Department of Sahid University and Technical Consultant for U.S. Soybean Export Council discussed how GE soybeans provide millions of Indonesians with a good quality and affordable source of protein and undergirds Indonesia's tempeh and tofu industry. Indonesia imports 2.6 million metric tons of soybeans annually, mostly from the United States due to tempeh producers' size and color preferences. Although the United States also exports non-GE soybeans, they cost around double the price of GE soybeans despite having no added nutritional benefit. The reliable, widescale availability of affordable U.S. GE soybeans "enables the low-cost production of tempeh and tofu. These products are staples for millions of Indonesians, especially among low- and middle-income groups," according to Dr. Dadi. "Tempeh and tofu play a key role in preventing malnutrition and the tofu and tempeh industry

Figure 9. Professor Hasil Sembiring explains the importance of biofortified rice to the Indonesian Government's nutrition goals.

Figure 10. Celebrity chef Giovani Vergio conducts cooking demo using U.S. GE soybeans and Indonesian GE potatoes.

support millions of jobs – street vendors, restaurants, food stalls, catering services."

While biotechnology can make nutritious staple foods like soybeans more affordable, it can also be used to outright enhance the nutritional profile of staple foods, and no staple is more heavily consumed in Indonesia than rice. BRIN Researcher and consultant for the International Rice Research Institute (IRRI) Professor Hasil Sembiring presented on the research behind Golden Rice, a rice variety biofortified with beta-carotene, a precursor of vitamin A, already being cultivated in the Philippines. Golden rice is currently awaiting a Food Safety certificate from Indonesia's Food and Drug Agency before it can be consumed by Indonesians. The application for feed safety assessment has been submitted to the Ministry of Agriculture and the application for environmental safety assessment, which is required before it can be cultivated in Indonesia, will be submitted in mid-2025.

IRRI and BRIN are conducting other research on high-iron and zinc fortified rice (HIZR), and a stacked variety with all three traits. "In the future, hybrid varieties will be developed through the crossing of Golden Rice and HIZR to emphasize the integrated nutritional benefits, " said Professor Hasil. "[This stacked variety] is expected to meet one third of the daily micronutrient needs for vulnerable groups and has high potential to support the Free Nutritious Meals program in meeting the nutritional needs of the Indonesian population. Hopefully, these biotechnology results can make a real contribution to the provision of nutritious food for all the people of Indonesia."

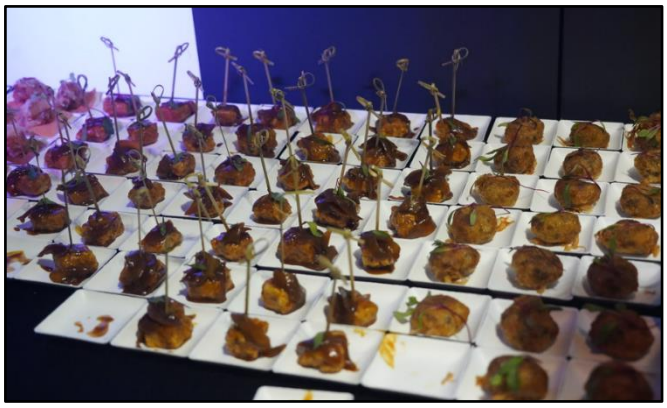

Figure 11. Chef Gio's creations using U.S. soybeans and Indonesian GE potatoes.

Figure 12. USDA Science Advisor Daniel Kovich gives closing remarks for the Indonesia Agricultural Biotechnology Showcase.

In the same vein as biotechnology supporting food security and nutritional goals, the showcase also featured a cooking demonstration by celebrity chef Giovani Vergio who prepared three dishes using Indonesian GE potato and U.S. GE soybeans, which audience members had the opportunity to taste for themselves. The Chef made tempeh karage with butter sauce, potato fritters, and stir-fried potatoes. Although not a biotechnology expert, he did share with the audience his impressions of base ingredients as a professional chef, commenting that he was very pleased with the bio granola potato's taste and low moisture, high starch content being ideal for potato fritters, French fries, and chips. When Chef Gio cut open a bio granola potato to show to the audience, he remarked, "The inside is beautiful white. Some other potatoes are yellow – good for soup – but for dry dishes or mashed potatoes, this kind of potato is so good."

To close the Indonesia Agricultural Biotechnology Showcase, U.S. Department of Agriculture Science Advisor Daniel Kovich expressed the United States' enthusiasm to continue its partnership with Indonesia on improving regulatory practices within Indonesia as well as on the international stage:

> "Getting these innovations into the hands of farmers is going to require some new regulatory paradigms globally. It is really critical that we have risk proportionate, science-based regulatory systems around the world so farmers can find markets for their products both domestically and globally. I would like to highlight our relationship under APEC[1]; the High-Level Policy Dialogue on agricultural

[1] Asia-Pacific Economic Cooperation

biotechnology is a very important forum. We've been pleased to work with Indonesia to help ensure that member states in APEC understand the benefits of biotechnology and can work together to ensure regulatory best practices to allow this technology to flourish, to encourage investments in research, and, most importantly, to get it into the hands of farmers. So, as we look to the future, talking about things such as data transferability, accepting risk assessments that have been performed in other countries, and other regulatory best practices will be critical. We very much look forward to continuing to cooperate with Indonesia on this project moving forward."

Indonesia Agricultural Biotechnology Showcase Receives Engaging Feedback from Speakers and Audience Members

After the conclusion of the event, FAS Jakarta sought feedback from speakers and audience members. One BRIN researcher in the audience commented that she felt the showcase was very holistic and inclusive of perspectives from researchers, private industry, government regulators, farmers, and even end users such as the chef. One of the speakers stated his appreciation for the showcase raising awareness of the products they have been working on for many years and garnering support from the GOI. One student in the audience asked the farmers panel about the potential risks to other plants around the farm, to which the GE corn farmer Hamzan Wadi replied that the biotech corn that he plants is actually helping the environment because with GE corn he can produce on 5 hectares of land the same amount as had produced using conventional corn on 15 hectares of land. He also replied the watermelon he produces after the GE corn harvest had no adverse effects from his biotech corn cultivation.

Figure 13. University students ask questions to farmers and researchers.

In total, in-person attendance reached maximum capacity at 320 attendees, 110 of whom were university students. Total livestream views of the event reached 2,538.

For official photos and the video recording of the Indonesia Agricultural Biotechnology Showcase please see the following links:

Flickr : https://www.flickr.com/photos/atamerica/albums/72177720326313038

YouTube : https://www.youtube.com/watch?v=1xuF2YxU7Ws

Attachments:

No Attachments.