

USDA Foreign Agricultural Service

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Global Agricultural Information Network

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Indonesia

Agricultural Biotechnology Annual

Annual 2011

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Report Highlights:

The Government of Indonesia (GOI) continues to advance its biotechnology policies and continues to indicate that enhanced access to biotechnology will be a part of Indonesia's broader policy for Indonesian agricultural production. This is reflected in recent food safety approvals for eight transgenic crops and the feed safety certificate for a feed enrichment. Additionally, the Ministry of Environment recently provided the environmental safety recommendation for three Indonesian biotechnology events of sugarcane to the Ministry of Agriculture. This indicates significant progress regarding Indonesia's acceptance of biotechnology.

Section I. Executive Summary:

In recent years, the Government of Indonesia has issued a variety of new regulations pertaining to biotechnology (BT), albeit at relatively slow pace. In 2005, Government Regulation No. 21 concerning Biosafety of Transgenic Products was released. In 2008, the National Agency of Drug and Food Control (BPOM) published the Guidelines for Food Safety Assessment on Transgenic Products. In 2010, Presidential Regulation No. 39 was issued, which established the Biosafety Committee for Transgenic Products, a necessary mechanism to complete outstanding and new biotechnology regulations. Additionally, labeling regulations for packaged and/or retail food products containing transgenic ingredients may be released in the future.

More recently, transgenic feed enzymes have been approved as a feed additive. Also two transgenic soybean varieties have received approval for food safety in Indonesia, as well as six transgenic corn varieties. Currently, three transgenic sugarcane varieties were recommended for environmental safety by the Ministry of Environment. This recommendation would be one consideration by the Ministry of Agriculture for its variety release approval. At present, the Indonesia Biosafety Committee for Transgenic Products is reviewing the food safety assessment of one sugar cane event.

Section II. Plant Biotechnology Trade and Production:

Currently Indonesia is not producing any transgenic crops, but it does produce and commercialize seedlings using tissue culture techniques. Among these are:

- tree seedlings (eucalyptus, acacia, mangrove) designed for domestic reforestation
- certain flower species for export, primarily to the European Union
- teak (*tectona grandis*),
- bananas (*musa sp*) cultivars of cavendish, raja bulu, kepok and barangan
- zodiac (*evodia suapeolens*)
- satoimo (*colocacia esculenta var. antiquorum*)
- black velvet (*alocasia reginula*)
- silver velvet (*alocasia sp.*)
- philodendron lynette
- dragon scales
- cuprea sp.
- pineapples (*ananas comusus*)
- potatoes (*solanum tuberosum L.*)
- orchids
- asparagus sp.
- nilam (*pacholi cublin*)
- strawberries (*duchesnea indica L.*)
- pulai pandak (*rauolfia radix*).

Indonesia will likely have a greater capacity to increase transgenic seeds and/or develop transgenic crops in 2012. On October 5, 2011 the Ministry of Agriculture issued the regulation No. 61/2011 on the procedures of testing, evaluating, releasing, and withdrawing of transgenic crop variety. The issuance of this regulation should speed up the licensing process, the environmental safety approval processes, and the field trials for transgenic products. Under this regulation the limited field trial for

environmental safety assessment can be paralleled with the adaptation trial for variety release assessment. Also, it will save two planting periods. In addition, if the transgenic product comes from the conventional hybrid, that has already obtained the variety release approval, that product will not require multi-location field trials. It only needs a comparison trial data with the conventional one and only from one location field trial from one planting period.

Currently the GOI has conducted confined field tests of several transgenic crops, to include rice (resistant to biotic stress), sugar cane (tolerant to a-biotic stress and modification of high glucose content), cassava (modification of amylase), potato (resistant to biotic stress), and tomato (resistant to biotic stress). Transgenic rice has also been field tested in 16 locations throughout Indonesia to fulfill the variety release requirements that were necessary to obtain licensing approval from the National Seed Agency.

Additional GOI research projects on transgenic plants such as virus resistance for tomatoes and potatoes, delayed ripening for papaya, sweet potato pest resistance, drought tolerant rice, and pest resistant soybeans, remain ongoing, albeit at a relatively modest pace.

Table 1. The status of environmental safety of the transgenic products is as follows:

No	Transgenic Product	Bio-safety Committee Recommendation	Government Approval Status
1.	BT Cotton Variety Bt DP 90 B (identical 90 BE 60023) & PM 1560 B (identical 1560 BE 72022) Event MON 531/757/1076 (MON-ØØ531-6, MON- ØØ757-7)	Safe towards environment and biodiversity (1999)	Limited release based on the Decree of Minister of Agriculture Decree in 2001, 2002, and 2003
2.	Roundup Ready Cotton Variety DP 5690 RR (identical 1220 RRA 68022) & DP 90 RR (identical 90 RE 60012) Event MON 1445/1698 (MON-Ø1445-2)	Safe towards environment and biodiversity (1999)	Approval letter by the Chairman of National Bio-safety Committee
3.	Roundup Ready Soybean Variety Cristalina RR & Jatoba RR Event GTS 40-3-2 (MON- Ø4Ø32-6)	Safe towards environment and biodiversity (1999)	Approval letter by the Chairman of National Bio-safety Committee
4.	Roundup Ready Corn Variety RR-1 & RR-2 Event GA 21 (MON- ØØ21-9)	Safe towards environment and biodiversity (1999)	Approval letter by the Chairman of National Bio-safety Committee
5.	BT Corn Variety Bt MON	Safe towards	Approval letter by the Chairman of

	810-1 & Bt Mon 810-2 Event MON 810 (MON- ØØ810-6)	environment and biodiversity (1999)	National Bio-safety Committee
6.	Ronozyme-P (probiotic feed)	Safe towards environment and biodiversity (2001)	-
7.	Finase-P and Finase-L (probiotic feed)	Safe towards environment and biodiversity (2001)	Bio-safety Recommendation from the Director General of Agriculture Research and Development Agency, Ministry of Agriculture
8.	Transgenic sugar cane	Safe towards environment and biodiversity (2011)	Environmental safety recommendation from the Ministry of Environment

Source: Indonesia Bio-safety Clearing House (2009) and FAS Jakarta (2011)

The Ministry of Environment recently submitted their recommendation on the environmental safety of transgenic sugar cane to the Ministry of Agriculture. The Ministry of Environment's recommendation is the last step and most important consideration by the Ministry of Agriculture to give the final approval for the environmental safety approval of the transgenic sugar cane variety. In theory, once the food safety and environmental safety approvals have been granted, the event can be fully commercialized and planted.

It is reported that some new transgenic crops have been assessed for their feed safety and food safety. The table below shows the status of these transgenic crops:

Table 2. The status of food/feed safety assessment results of transgenic products

No	Transgenic Crops	Bio-safety Committee Recommendation	Government Approval Status
1.	Herbicide Tolerant Corn (NK 603)	Safe for food consumption (2010)	Food Safety Certificate issued by the National Agency of Drug and Food Control (2011)
2.	Insect Resistant Corn (MON89034)	Safe for food consumption (2010)	Food Safety Certificate issued by the National Agency of Drug and Food Control (2011)
3.	Herbicide Tolerant Corn (GA21)	Safe for food consumption (2011)	Food Safety Certificate issued by the National Agency of Drug and Food Control (2011)
4.	Insect Resistant Corn (BT11)	Safe for food consumption (2011)	Food Safety Certificate issued by the National Agency of Drug and Food Control (2011)
5.	Insect Resistant Corn	Safe for food	Food Safety Certificate issued by the

	(MIR162)	consumption (2011)	National Agency of Drug and Food Control (2011)
6.	Insect Resistant Corn (MIR604)	Safe for food consumption (2011)	Food Safety Certificate issued by the National Agency of Drug and Food Control (2011)
7.	Herbicide Tolerant Soybean (GTS40-3-2)	Safe for food consumption (2011)	Food Safety Certificate issued by the National Agency of Drug and Food Control (2011)
8.	Herbicide Tolerant Soybean (MON89788)	Safe for food consumption (2011)	Food Safety Certificate issued by the National Agency of Drug and Food Control (2011)
9.	Ronozime AX (CT)	Safe for feed consumption	Feed Safety Certificate issued by the Ministry of Agriculture (2010)

Source: FAS Jakarta (2011)

Table 3. The status of food safety assessment of transgenic products:

FAS Jakarta (2011)

: Biosafety Clearing House

: Has been done

: Has not been done

: Public notification for 60 days has been done

** : Public participation has been submitted to the secretariat of the committee of bio-safety and food safety

Table 4. The status of bio-safety assessment of transgenic crops in Bio-safety containment test (BCF) and Confined field trial (CFT)

Crops	Trait	Gene	Institution	BCF		CFT	
				Green house	Screen house	Small scale	Large scale
Corn	Corn borer resistant (MON89034)	<i>CryIA.105 and cry2Ab2</i>	Monsanto	2009-2010	-	-	2010
Corn	Corn borer resistant (TC1507)	<i>CryIF</i>	Dupont-Pioneer	2009-2010	-	-	-
Corn	Herbicide tolerant (NK603)	<i>CP4EPSPS</i>	Monsanto	2001	-	-	2002
Corn	Corn borer resistant (BT11)	<i>Btk</i>	Syngenta	2011	-	2011	-

Corn	Herbicide tolerant (GA21)	<i>mEPSPS</i>	Syngenta	2011	-	2011	-
Corn	Corn borer resistant and herbicide tolerant (BT11xGA21)	<i>Btk and mEPSPS</i>	Syngenta	-	-	2011	-
Rice	Stem borer resistant	<i>CryIAb</i>	CBRD-IIS	2001 - 2002	-	-	2002-2006
Rice	Nitrogen use efficiency	CsNitri1-L	ICABIOGRAD	2007 - 2010	-	-	-
Rice	Brown planthopper resistant		Padjadjaran University	2010	-	-	-
Sugar cane	Drought tolerant	betA	PTPN-XI/Jember University	2005 - 2007	-	-	2005-2007
Sugar cane	High glucose content	SoSPS1	PTPN-XI/Jember University	2008	-	-	2008 - 2010
Potato	Leaf blight resistant	RB	ICABIOGRAD/RIV	2007 - 2008	-	-	2007 - 2011
Tomato	Viruses resistance (tomato yellow leaf curl virus and cucumber mosaic virus)	Coat protein	ICABIOGRAD/RIV	2007 - 2008	-	-	2009
Tomato	Low seed content (parthenocarpy)	defH9-iaaM and defH9-RI-iaaM	ICABIOGRAD	2006 - 2007	2009	-	-
Cassava	Low amylose content	IRC-GBSS	ICABIOGRAD/IIS	2005	2006 - 2008	-	2007 - 2010
Papaya	Delayed ripening	Antisense ACC Oxidase	ICABIOGRAD	2005	2006 - 2010	-	-

Dr. M. Herman, Indonesian Center for Agricultural Biotechnology and Genetic Resources Research Development, Ministry of Agriculture (2011)

Based on the recommendation from the Biosafety Committee for Transgenic Products that transgenic corn NK603, MON 89034, MIR 162, MIR 604, BT11, GA21 and transgenic soybean MON 89788 and GTS 40-3-2 are safe for food consumption, the National Agency of Drug and Food Control (BPOM) issued the food safety certificate for those transgenic crops.

Following a public notification and comment period of 60 days, transgenic corn NK603 recently finished the Biosafety Clearing House. All public comments submitted during the comment period will

be submitted to the secretariat of the Biosafety Committee for Transgenic Products. The secretariat will forward the comments to the Biosafety Committee for their discussion and will further provide their recommendation to the Ministry of Environment.

Post sources have also reported that the environmental safety assessment of Golden Rice gene in popular Indonesian rice varieties - Ciherang and IR-64 - will begin in March 2012.

Section III. Plant Biotechnology Policy:

The GOI's policy on biotechnology is "accept with a precautionary approach" with respect to environmental safety, food safety, and/or feed safety based on scientific approaches as well as taking into considerations of religion, ethical, socio-cultural, and esthetical norms. Therefore, several regulations and guidelines have been issued to protect the public from the possibility of negative consequences of biotechnology utilization.

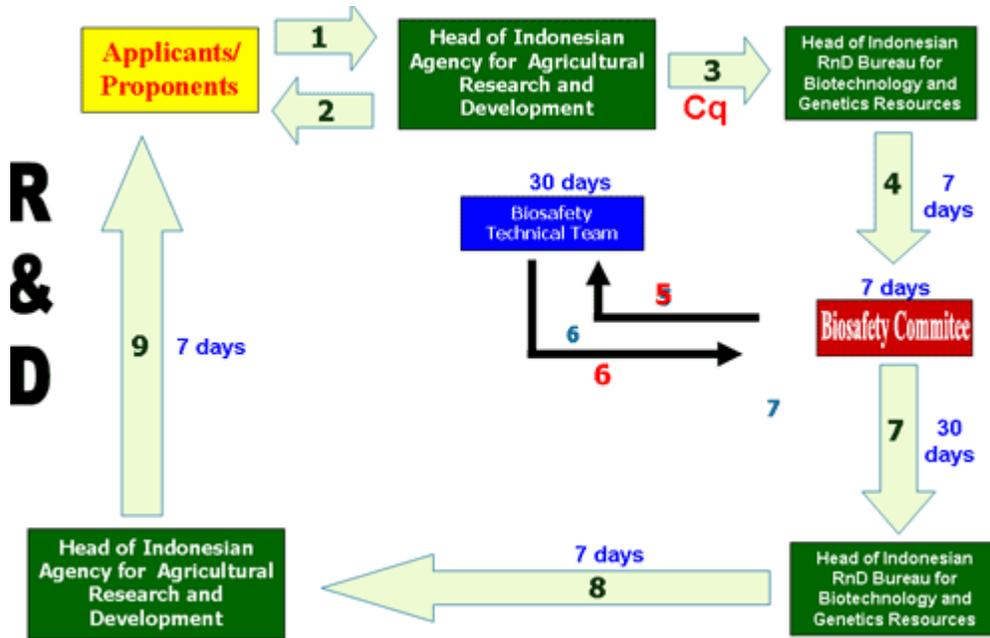
The Ministers of Environment, Agriculture, Forestry, Marine Affairs and Fisheries, and the Head of National Agency of Drug and Food Control are the authorities that have responsible for approving and releasing the transgenic products. The table 5 shows each ministry roles as the national competent authority.

Table 5. The National Competent Authority for Biosafety and Food Safety of Transgenic Products

No.	National Competent Authorities		Responsible for
	Ministry	Office	
1.	Ministry of Environment	Deputy for Biodiversity Conservation Enhancement and Environmental Destruction Control	Bio-safety
2.	Ministry of Agriculture		Feed safety and fresh food safety
3.	Ministry of Agriculture	Center for Investment and License	Seed imports permit
4.	Ministry of Agriculture	National Seed Agency	Crop variety release
5.	Ministry of Agriculture	Indonesian Agency for Agriculture Research and Development	Research permit
6.	Ministry of Agriculture	Indonesian Agency for Agriculture Quarantine	Plant and animal imports
7.	National Agency of Drug and Food Control		Processed food safety
8.	Ministry of Marine Affairs and Fisheries	Research Center for Marine and Fisheries Product Processing and Biotechnology	Fisheries products and fish feed
9.	Ministry of Forestry		Forestry plants

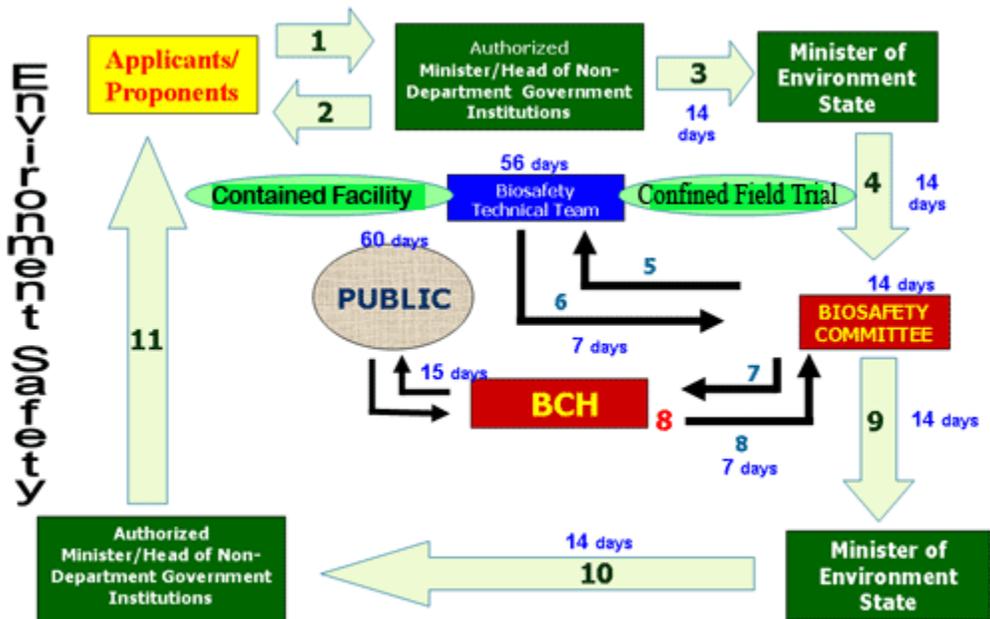
Source: Indonesia Bio-safety Clearing House (2010) and FAS (2011)

According to the Government Regulation No. 21 in 2005, the procedures for approval of food, feed, processing and environmental releases are showed in the following figures.



Source: Indonesia Bio-safety Clearing House (2010)

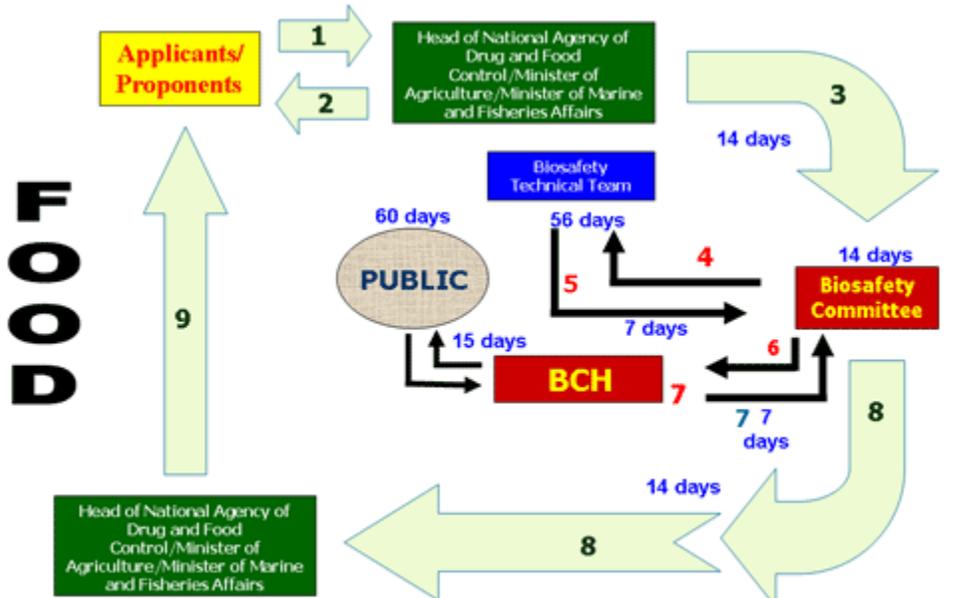
Figure 1. Procedure for Research and Development based on Government Regulation No. 21/2005



* For the introduction of the first seed, the applicant/proponent must apply for permission to the Head of Indonesian Agency for Agricultural Research and Development through licensing and Investment Center

Source: Indonesia Bio-safety Clearing House (2010)

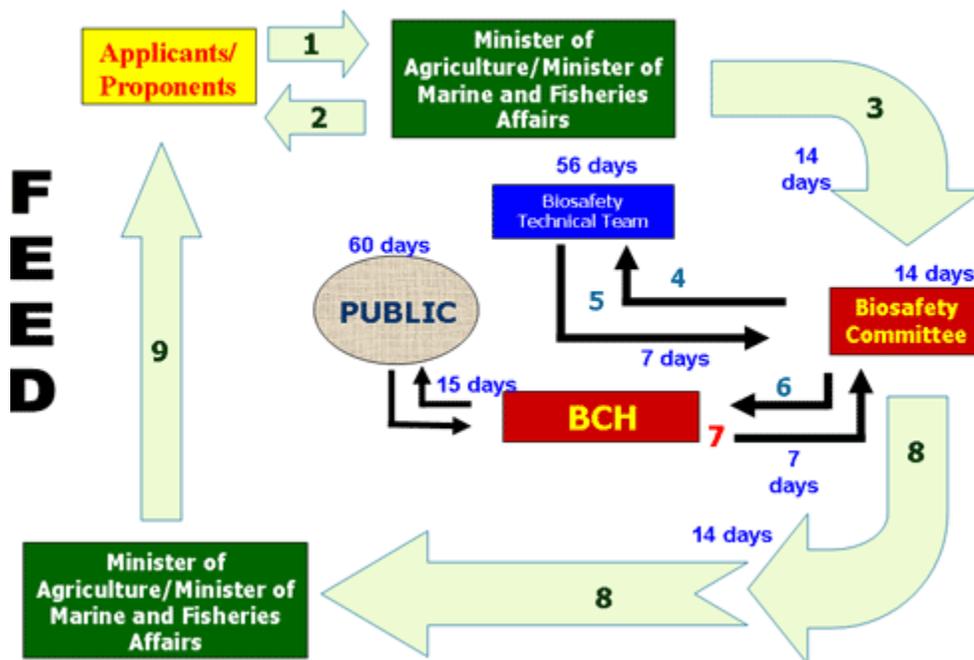
Figure 2. Procedure for Environment Safety based on Government Regulation No. 21/2005



* Application for fresh feed safety inspection and food safety recommendation must be sent to the Authorized Minister, where as application for processed food must be sent to Head of National Agency of Drugs and Food Control.

Source: Indonesia Bio-safety Clearing House (2010)

Figure 3. Procedure for Food Safety based on Government Regulation No. 21/2005



Source: Indonesia Bio-safety Clearing House (2010)

Figure 4. Procedure for Feed Safety based on Government Regulation No. 21/2005

Five years after issuing the regulation on Biosafety of Transgenic Product in 2005, the President signed the Presidential Regulation on establishing the Biosafety Committee for Transgenic Products to implement the regulation. The old committee that had been in place since 1999 was dismissed. The new committee consists of 21 members from a variety of stakeholders, including government ministries, universities, and professional associations. GAIN Report ID1017 regarding the Presidential Regulation No. 39/2010 on The Committee of Biosafety on Transgenic Products explains this in more detail.

Most of the members of the Biosafety Committee for Transgenic Products are high level government officials, although they are not necessarily biotechnology experts. The Technical Team for Biosafety, who assists the Committee to conduct the technical assessments, has technical expertise in environmental safety and food safety fields. The Committee has assigned the previous Technical Team for Biosafety to continue carrying out their duties on document assessment of bio-safety testing until the new Technical Team for Biosafety is established.

To implement the government regulation on Biosafety of Transgenic Product in 2005 and in conjunction with the government regulation on food safety, quality, and nutrition in 2004 BPOM finally released its new regulation concerning the guidelines for food safety assessment for transgenic products in July 2008. In addition, the guidelines don't cover the threshold level of GMO content in the product. The guidelines are needed to bring Indonesia into compliance with the Cartagena Protocol on

biosafety.

For labeling requirements, reportedly BPOM - together with the Biosafety Committee - is revising the labeling regulations for packaged retail foods that contain transgenic products. Post source reported that BPOM is expected to publish the labeling regulation before the end of 2010, although it has not been released.

Other than environmental safety and food safety assessment, transgenic crops for feed consumption also need to be formally assessed for their feed safety. However, at the present there are no guidelines for a viable feed safety assessment. FAS Jakarta sources report that the Program for Biosafety Systems (PBS) has given assistance to the Indonesia government in developing the guidelines. It is expected the guidelines for feed safety assessment will be released in the near future.

In 2004 Indonesia ratified the Cartagena Protocol with Government Regulation No. 21/2004 concerning Bio-safety to the Convention on Biological Diversity.

At present, there are no imported or locally developed commercial transgenic seed varieties approved for planting in Indonesia. Nevertheless, research activity at a relatively low level (for example: second replication of containment trials) continues. Also the GOI is continues to conduct research and development at the Bogor Agricultural University. However, as previously mentioned, on October 5, 2011, the GOI implemented a new regulation that allow for transgenic products to have greater access to the Indonesian market. Therefore new developments with regard to Indonesia's ability to import or develop local commercial transgenic seeds may occur at some point in the next 12-18 months.

A government regulation issued in 1999 requires labels and special logos to be on packaging of food containing transgenic ingredients, although this has yet to be enforced. Reportedly the government will only require labeling of food products containing more than 5 percent content derived from transgenic processes. Local development, multiplication and use of transgenic seed continue to be hampered by the current regulatory system. This, plus additional confusion in the IPR sector, are major impediments to increased investment in Indonesian biotechnology activities.

Given the current situation, forecasting likely outcomes for the Indonesian biotech sector is problematic. However, it exposed on the variety workshops and seminars that biotechnology can play its role in supporting food security in Indonesia.

Section IV. Plant Biotechnology Marketing Issues:

In 2006 there was a survey to determine the Indonesian public's willingness to accept transgenic products. The survey targeted students at a well-known agriculture university in Indonesia. The research showed that the students lack knowledge of transgenic foods, even if they had a class in biology. The study also found that students: (1) are somewhat willing to consume transgenic foods if transgenic products reduce the amount of pesticides applied to crops, (2) are very willing to consume transgenic foods if the foods were more nutritious than non-transgenic foods, (3) will avoid consuming transgenic foods if the foods posed a risk of causing allergic reactions for some people, (4) consider ethical and religious concerns as very important to purchasing decisions, (5) had mixed reactions on the importance of price when making the decision to purchase transgenic foods, (6) feel labeling of

transgenic foods should be mandatory even though it will affect the price, and (7) think that existing governmental regulations on food safety remain poor.

Section V. Plant Biotechnology Capacity Building and Outreach:

In coordination with the Ministry of Agriculture, FAS Jakarta hosted a one-day Food Security workshop entitled: “Indonesia – U.S. Partnership: Agricultural Innovation and Investment to Enhance Food Security” in March 2010. The workshop emphasized potential areas of enhanced collaboration, which led to the workshop recommendations from participants to focus on corn, cocoa, coffee, horticulture, and aquaculture commodities. Collaboration is to include enhanced technology (research), post-harvest investment with a focus on trade capacity building (regulatory reform based on science, production systems, value-added processing, supply-chain distribution, and farm-to-market infrastructure). Collaborating partners are to include the bilateral government agencies, private sector agribusiness companies, and agricultural (Land Grant) university linkages. On the workshop, much of the discussion on enhanced technology focused on biotechnology – especially for corn. One of the main recommendations from the participants was to bring an Indonesian delegation to the Philippines on a biotechnology study tour. FAS Jakarta – through funding from USDA/FAS/– organized the trip in coordination with CropLife Asia and the Biotechnology Coalition of the Philippines. The Indonesian delegation represented the Ministry of Agriculture, CropLife Asia, university and government researchers, and agricultural officers from the major corn production provinces of Lampung and East Java. The delegation learned about the implementation of regulations and policies in the development of commercialization in Philippines, research and development of technology that supports public – private partnership, government policy and implementation of biotechnology product development, and efforts for acceleration of biotechnology implementation in Indonesia. Following the success of the Indonesian delegation trip to the Philippines, the Minister of Agriculture has stated his desire to also visit the biotech crop field in the Philippines in 2010. Also, Minister Suswono visited Monsanto’s headquarter in St. Louis, MO in May 2011.

FAS Jakarta, in coordination with the Ministry of Agriculture, hosted a two-day Food Security workshop entitled “Indonesia – U.S. Partnership: Agricultural Technology & Investment Forum in October 2011. The Forum focused on three main themes, including: 1. New Agricultural Technologies; 2. Facilitating Trade through Investment in Post Harvest Infrastructure; and 3. Agricultural University Linkages.

Because Indonesian farmers will be the end users of transgenic seeds, FAS involved Indonesian farmers by bringing them to the Philippines to meet their Filipino counterparts and to learn firsthand about how the Filipino farmer benefit from planting transgenic corn. FAS Jakarta – through funding from USDA – organized the trip in coordination with International Service for the acquisition of Agri-biotech Applications (ISAAA)/Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA), and FAS Manila. The Indonesian farmer delegation represented farmers from the major corn producing provinces, to include East Java, Lampung, Central Java, North Sumatera, and South Sulawesi. The delegation learned about biotechnology’s benefits, biotech maize farming, partnership in biotech farming, and raising farmer’s capacity for effective communication on biotech crops.

FAS Jakarta has actively recruited Cochran Fellows and participants for other USDA-sponsored events

since 1998. Following is a list of the activities from FAS Jakarta for capacity building on biotechnology over the past two years with detailing participants from Indonesia.

Cochran Fellowships from Indonesia Related to Biotechnology

None

Biotechnology “Capacity Building” Events Sponsored by USDA

- ROUND TABLE DISCUSSION ON LOW LEVEL PRESENCE - SINGAPORE
February 17 – 18, 2009
1 Indonesian attendee
- 8TH APEC HIGH LEVEL POLICY DIALOGUE - SINGAPORE
February 19 – 21, 2009
1 Indonesian attendee
- BIOTECH LABELLING OUTREACH WORKSHOP - SINGAPORE
February 22 – 23, 2009
3 Indonesian attendees
- 9TH APEC HIGH LEVEL POLICY DIALOGUE – SAPPORO, JAPAN
May 29 – 30, 2010
3 Indonesian attendees
- ROUND TABLE DISCUSSION ON LOW LEVEL PRESENCE – SAPPORO, JAPAN
May 27 – 28, 2010
3 Indonesian attendees
- 10TH APEC HIGH LEVEL POLICY DIALOGUE – WASHINGTON, DC
February 28 – March 2, 2011
2 Indonesian attendees
- STUDY VISIT OF HIGH LEVEL GOI OFFICIALS ON BIOTECH CROPS IN WASHINGTON, DC AND ST. LOUIS, MO
March 3 – 9, 2011
5 participants and 1 LES

Biotechnology Capacity Building Events Sponsored by FAS Jakarta (through TIRF and CSS funding)

- Study Visit of High level GOI officials on Biotech Crops in the Philippines, July 5 – 9, 2010.
- “Agriculture Arrives Late to Climate Debate” Seminar with sole speaker Mr. Jack A. Bobo, Senior Advisor for Biotechnology, U.S. Department of State, September 24, 2010.
- “Agricultural Biotech Products Acceptance” Seminar with sole speaker Dr. Val Giddings, Senior

Fellow for Biotechnology Policy with the Information Technology and Innovation Foundation (ITIF), May 30, 2011

- Biosafety: An International Short Course in Environmental Aspects of Agricultural Biotechnology for the Ministry of Environment's officials at the Michigan State University, East Lansing, MI, July 31 - August 5, 2011 (joint funded with USAID)
- Farmer to Farmer Workshop: Agricultural Biotechnology Outreach and Capacity Building, September 19 – 23, 2011 (jointly funded by ISAAA/SEARCA and FAS Manila)

Biotechnology Capacity Building Events Sponsored by U.S. Government

- Food Security Workshop: Agricultural Innovation and Investment to Enhance Food Security, March 2, 2010 (funded under Biotech Outreach Fund, Bureau of Economic, Energy, and Business Affairs (EEB), U.S. Department of State)
- The Indonesia – U.S. Agricultural Technology and Investment Forum, October 6 – 7, 2010, as a follow up to the Food Security Workshop (jointly funded under Biotech Outreach Fund, Bureau of Economic, Energy, and Business Affairs (EEB), U.S. Department of State and USDA/FAS/EMP.)
- Legal and Policy Analysis Workshop, February 14, 2011 (funded under USAID through International Food Policy Research Institute (IFPRI)/Program for Biosafety System (PBS))
- Workshop on “Sociocultural Considerations, Biosafety, Biotechnology and Decision Making in Indonesia, June 1, 2011 (funded under USAID through IFPRI/PBS)
- NetMapping Workshop on “Developing a Biotechnology Outreach Strategy for Indonesia”, June 14 – 15, 2011 (funded under USAID through IFPRI/PBS)
- Workshop on “Biology and Genetics of Genetically Modified Organism (GMO)”, July 18, 2011 (funded under USAID through IFPRI/PBS)

Indonesia has significant capacity to promulgate but limited capability to enforce regulations with respect to food safety and biosafety of transgenic-origin products. Reportedly, Indonesia has specific needs in raising the capacity of this country to apply transparent and science-based regulations to plant biotechnology, such as: knowledge improvement of technical team through biosafety training on future transgenic products, improvement of biosafety facilities (environment, food, and feed safety), revision of the guideline for environment safety assessment, finalization the guideline for feed safety assessment, finalization the guideline for research and development of transgenic products in the laboratory, biosafety containment, and confined field, as well as developing a guideline for monitoring and risk management.

On July 19, 2011 the Ministry of Environment held a talk show on “The Public Perception to GMOs”. The result showed that the precautionary approach is essential due to pros and cons in accepting the genetically modified products. Furthermore, on July 21, 2011 the Ministry of Agriculture held a national workshop on “The Seed Development through Biotechnology to Support Food Security” which

underlined the advantages of agriculture biotechnology, especially for food security.

Section VI. Animal Biotechnology:

Although the regulations regarding transgenic animals are in place, Indonesia does not currently produce or commercialize transgenic animals. The general consensus is that the application of transgenic animals in Indonesia is still a long ways off. However, some research institutions and universities have conducted studies on molecular marker, such as: research on genetic cow and bull using gen markers, identification of animal characteristics to heat tolerance and feeding utilization, and transgenic chicken (resistance to New Castle disease) using simple breeding method.

Reportedly, two local companies have requested an approval to the Commission of Bio-safety for transgenic products for importing avian influenza vaccines that were produced using biotechnology, yet they have difficulties to seek the testing laboratory for supporting data to the Commission.

Section VII. Author Defined:

Useful websites:

- Indonesia Biosafety Clearing-House: <http://indonesiabch.org>
- Indonesian Center for Agricultural Biotechnology and Genetic Resources Research and Development(ICABIOGRAD), Ministry of Agriculture: <http://biogen.litbang.deptan.go.id/cms/>
- Clearing House Mechanism of National Biodiversity: <http://bk.menlh.go.id/?&lang=en>
- Indonesian Biotechnology Information Center (IndoBIC): <http://www.indobic.or.id/>