

USDA Foreign Agricultural Service

GAIN Report

Global Agricultural Information Network

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Singapore

Agricultural Biotechnology Annual

Approved By:

Chris Rittgers

Prepared By:

Bernard Kong

Report Highlights:

In January 2013, Singapore revised its Biosafety Guidelines on Research. No other significant policies or regulatory changes in the Agro biotechnology sector in Singapore were made in the 12 month-period since the last report. One new GE product has been approved.

Section I. Executive Summary:

Being totally dependent on food supplies from other countries, in 2012 Singapore imported US\$12.03 billion in agricultural, fish and forestry products from the rest of the world. In the same year, total agricultural imports from the United States, the fifth largest supplier amounted to US\$8486 million. Major food imports include alcoholic and non-alcoholic beverages, dairy products, fish and seafood, poultry and meat, edible oils, fresh fruit and vegetables and snack foods.

Singapore has a science based regulatory framework and a Genetic Modification Advisory Committee (GMAC) to establish bio safety guidelines. In 2006, GMAC published Guidelines covering research and release of agriculture-related GE products. Prior to imports and distribution, applications have to be submitted to GMAC for approval.

Singapore has established an Agro-Bio Park to promote R&D in agro-technology and to attract foreign and local investments in agro-tech activities. Singapore also hopes to develop into a regional hub for agricultural consultancy, seed technology, and development in tropical agriculture. In addition, research and development in gene therapy, biologics R&D, diagnostics and genetic engineering have long been considered fundamental to Singapore's rapidly expanding biomedical industry, a key pillar of Singapore's economic growth and a major export sector.

All imported foods, both GE and non-GE, have to be determined safe by their respective national regulatory bodies of the exporting countries as well as in compliance with international safety standards established by Codex Alimentarius before they are allowed entry into Singapore.

Section II. Plant Biotechnology Trade and Production:

GE products must be submitted to the GMAC for review in accordance with the guidelines on the Release of Agriculture-Related GE products. The guidelines cover both processed and unprocessed food products and provide the framework for risk assessment of GE products to human health and the environment. These guidelines also provide the approval mechanisms for their release. Once the application has been endorsed by GMAC, it will be forwarded to the regulatory authorities for approval.

Singapore does not produce any agricultural-related GE products. There are also no domestically initiated biotechnology crops under development. GMAC has approved imports of GE corn and soybeans.

Singapore is not a food aid recipient and is unlikely to be one in the foreseeable future.

Section III. Plant Biotechnology Policy:

Regulatory Framework:

GMAC, an inter-agency body, is responsible for overseeing GE research, production, use, handling and release. GMAC implements the regulatory and administrative framework for approving GEs, and coordinates with overseas agencies to harmonize guidelines. GMAC employs the concept of "substantial equivalence" when considering food safety approvals. GMAC also strives to ensure regulations are consistent with international standards and also that there is a streamlined approval and evaluation process. Central to this framework is the use of existing legislation and food regulations enacted under the Singapore's Food Act.

The GMAC consists of representatives from the following agencies:

- *Agency for Science, Technology and Research (ASTAR)
- *Agri-Food and Veterinary Authority of Singapore (AVA)
- *Ministry of Manpower
- *Consumers Association of Singapore (CASE)
- *Institute of Molecular and Cell Biology (IMB)
- *Ministry of Health (MOH)

- *Nanyang Technological University (NTU)
- *National Institute of Education (NIE)
- *National Parks Board (NParks)
- *National University of Singapore (NUS)

The GMAC has four subcommittees covering the areas identified below:

1. Release of Agriculture-Related GEs
2. Biosafety Guidelines for Research on GEs.
3. Labeling of GEs and GE-derived products.
4. Public Awareness

First released in May 2006, in January 2013 GMAC revised the biosafety Guidelines for Research on GEs. Full details of the revised Guidelines are available on the GMAC website: www.gmac.gov.sg.

GE Registration:

GMAC maintains a register of approved GE products. Once the GEs under consideration are approved for release, the GEs are registered with the GMAC Secretariat.

Procedures for Notification:

Prior to the distribution of any agriculture-related GEs in Singapore, the importer is required to submit a proposal before GMAC. The importer should consult GMAC to determine the appropriate approval process for the agriculture-related GEs and the specific information necessary for an assessment.

Procedures for approval:

The GMAC will forward the proposal to the appropriate Sub-Committee. The Sub-Committee may either endorse/reject the proposal or appoint the relevant agency or an expert panel to evaluate the proposal within 90 days. The panel of experts will review and assess the risks associated with each stage of the release. The agency/expert panel will submit their recommendations to the Sub-Committee within 90 days. The GMAC decided on the recommendations of the Sub-Committee within 60 days. GMAC can request further information/clarification from the Proponent should the need arises.

The proponent is required to disclose the necessary information for risk assessment and safety. The broad classification of information required for GMAC to carry out a risk assessment includes:

1. Species of organisms
2. Eventual use of GE
3. Location for release
4. Habitat and ecology
5. Genetics of the GE
6. Data from contained work and other studies
7. Experimental procedures, monitoring and contingency planning

Political Factors:

Singapore follows internationally proven science based standards in enacting the regulatory framework for approving the imports of agriculture related GEs. Singapore tends to follow the lead of developed countries and international bodies like CODEX in allowing the entry of GEs into the country.

Cartagena Biosafety Protocol:

At the time of writing this report, Singapore is not a signatory to the biosafety protocol.

Names and agencies of current office holders of the GMAC Committee:

Professor Paul TENG(Chairman)
Dean
National Institute of Education

Professor Prakash Kumar (Deputy Chairman)
Department of Biological Sciences
National University of Singapore
(Chairman, Subcommittee on Research on GEs)

Dr. CHUA Sin Bin
Principal Consultant
Agri-Food Technologies Pte Ltd
(Chairman, Subcommittee on Labeling)

Dr. Paul CHIEW
Director, Laboratories Department
Agri-Food and Veterinary Authority of Singapore
(Chairman, Subcommittee on Public on Public Awareness)

Associate Professor Peter DROGE
Division of Molecular Biology & Genetics
School of Biological Sciences,
Nanyang Technological University

Mr. SEAH Seng Choon
Executive Director
Consumers Association of Singapore

Dr. FOO Ngee Chih
Deputy Director
Biomedical Research Council
Agency for Science Technology and Research

Ms. Mavis CHIONH Sze Chyi
Chief Prosecutor
Economic Crimes and Governance Division
Attorney-General 's Chambers

Dr. Lena CHAN
Deputy Director
National Biodiversity Centre
National Parks Board

Assistant Prof Uttam SURANA
Principal Investigator
Institute of Molecular and Cell Biology

A/Prof Davis NG
Senior Principal Investigator

Temasek Life Science Laboratory

Dr. Lucy LEONG Yi Min
Senior Specialist , Occupational Medicine
OSH Specialist Department
Ministry of Manpower

Dr. SE THOE Su Yun
Head
Biosafety Legislation
Ministry of Health

List of Biotechnology crops permitted to be imported into Singapore

Crop	ID	Purpose
Corn	MON863	Food, feed, or as ethanol
Corn	NK603	Food, feed, or as ethanol
Corn	MON88017	Food, feed
Canola	GT73	Food, feed
Cotton	15985	Food, feed
Cotton	MON1445	Food, feed
Cotton	MON531	Food, feed
Cotton	MON88913	Food, feed
Sugar beet	H7-1	Food, feed
Soy bean	40-3-2	Food, feed
Soy bean	MON 89788	Food, feed
Corn	59122	Food, feed
Soybean	305423	Food,feed
Alfafa	J101;j163	As constituents of animal feed

Following are the new GEs approved by AVA since the last report.

Crop	ID	Purpose
Soybean	A2704-12	Food, feed or for processing

Section IV. Plant Biotechnology Marketing Issues:

In general, no barriers exist to imports of U.S. GE products, as long as they have already been approved by U.S. federal agencies. There are basically no political barriers enacted against the import of genetically modified organisms. Importers applying to import GE products must first prove that these GEs are considered safe for public consumption in their countries of origin before they are allowed entry into Singapore. Food producers must perform tests on the quality, allergenicity, toxicity, composition and nutritional values of food derived from GEs before these foods are allowed entry. Foods containing new substances as a result of genetic modification are subjected to additional tests.

There are also no vocal consumer groups actively campaigning against the imports of GE products.

GE Labeling Policy:

Currently, Singapore does not require labeling to identify GE content. However, authorities are reportedly monitoring worldwide trends and developments on labeling and will assess decisions reached at Codex Alimentarius meetings to determine if recommendations that are adopted at these meetings need be implemented locally.

Public Awareness Campaign:

Efforts have routinely been made to educate the public on genetically modified organisms (GEs) or GE derived products through public awareness programs.

GMAC conducted the GMAC Students Challenge in 2012 for students from secondary schools, in which students were invited to produce a short documentary clip depicting the role of agricultural biotechnology in mitigating climate change. Members of the public voted for their favorite shortlisted entries that were displayed on Facebook. The competition concluded with a screening session in Biopolis, the office location of GMAC.

Section V. Plant Biotechnology Capacity Building and Outreach:

The Office of Agricultural Affairs (OAA) in Singapore carried out extensive efforts to recruit delegates from Singapore, Brunei and Papua New Guinea to the following APEC meetings.

- 1) APEC Laboratory Capacity Building Workshop July 16-19, 2012, Vietnam
- 2) APEC Food Safety Cooperation Forum (FSCF)'s Partnership Training Initiative Network (PTIN) July 12, 2012, Kuala Lumpur, Malaysia. 9-

Section VI. Animal Biotechnology:

There has been no approval for research on GM animals.

Section VII. Author Defined:

Reference Materials:

Useful websites: Genetic Modification Advisory Committee
Website: <http://www.gmac.gov.sg>
Agri-Food & Veterinary Authority of Singapore
Website: <http://www.ava.gov.sg>