Required Report - public distribution

Date: 12/11/2018
GAIN Report Number: SN8006

Singapore

Agricultural Biotechnology Annual

2018

Approved By:
William Verzani, Agricultural Attaché
Malaysia, Singapore, Brunei and Papua New Guinea

Prepared By:
Ira Sugita, Agricultural Specialist

Report Highlights:
Singapore does not have any domestic commercial production of plant biotechnology. As of October 2018, 35 genetically engineered (GE) plant products have been approved for use as food or food ingredients in the country. Singapore does not have any specific guidelines on the labeling of GE products but is closely following international trends and practices on the issue.

Table of Contents

EXECUTIVE SUMMARY

Plant biotechnology product development in Singapore is minimal and has been limited to just one unfinished project to date. As a result, there is no commercial production of genetically engineered (GE) plants in the country.

Singapore is a large importer of processed food products, many of which (e.g. corn syrup, soybean oil, etc.) may have been derived from GE crops. In 2017, Singapore imported over $6.5 billion in consumer-oriented food and beverage products with the top suppliers being Malaysia, Australia and the United States. A total of 35 GE plant products have been approved for use as food or food ingredients in the country.

Singapore's Agri-Food and Veterinary Authority (AVA) regulates GE crops and their market access. The multi-agency Genetic Modification Advisory Committee (GMAC) was established under the country's Ministry of Trade and Industry in 1999 to oversee and provide science-based advice on research & development, production, release, use and handling of GE events in Singapore. Its objective is to "ensure public safety while maintaining an environment that is conducive for commercial exploitation of GE products".

Currently, Singapore does not have any specific guidelines on the labeling of GE products. Singapore's position on GE labeling is in tandem with international trends and practices. AVA's fundamental principle is that any labeling must be "practical, scientifically-driven and effectively implementable across countries". AVA and GMAC are expected to continue monitoring international developments closely.

Singapore's animal biotechnology development is limited to research activities in fish hatchery technology. There is no commercial animal biotechnology production in the country.

CHAPTER 1: PLANT BIOTECHNOLOGY

PART A: PRODUCTION AND TRADE

a) PRODUCT DEVELOPMENT:

Plant biotechnology product development in Singapore is minimal and has been limited to just one unfinished project to date.

Singapore's Agri-Food and Veterinary Authority (AVA) granted approval in 2015 for a local company, JOil (S) Pte. Ltd, to conduct small scale field trials for genetically engineered (GE) Jatropha kernels with high oleic acid content for the biofuels industry. Industry contacts report the field trials are still ongoing.

b) COMMERCIAL PRODUCTION:

There is no commercial production of GE plants in Singapore.

c) EXPORTS:

Singapore does not export any GE crops.

d) IMPORTS:

Singapore imports of GE agricultural products in bulk form are negligible as the local livestock industry is insignificant. However, the country is a large importer of processed food products, many of which (e.g. corn syrup, soybean oil, etc.) may have been derived from GE crops. Data on the exact percentage of imports derived from GE plant products is unavailable. In 2017, Singapore imported over $6.5 billion in consumer-oriented food and beverage products with the top suppliers being Malaysia, Australia and the United States.

e) FOOD AID:

Singapore does not provide or receive food aid.

f) TRADE BARRIERS:

There are no barriers for the import of GE plant products, provided they have been approved for commercial use by official regulators in the country of origin. Also, there are currently no mandatory guidelines on the labeling of foods, seeds, fibers, oils, or feeds that are derived from biotech crops.

PART B: POLICY

a) REGULATORY FRAMEWORK:

AVA has authority over GE crop regulations and marketing. The multi-agency Genetic Modification Advisory Committee (GMAC) was established under the country's Ministry of Trade and Industry in 1999 to oversee and provide science-based advice on research & development, production, release, use and handling of GE events in Singapore. Its objective is to "ensure public safety while maintaining an environment that is conducive for commercial exploitation of GE products". As an advisory committee, GMAC works closely with other national bodies and regulatory agencies, particularly AVA and the Ministry of Health (MOH). GMAC published *Guidelines on the Release of Agriculture-Related "GMOs"* (1999) and *Biosafety Guidelines for Research on "GMOs"* (2006, revised in 2008 and January 2013). Also, GMAC endorsed as a separate Annex on their website, the document *Risk Assessment of Stacked events* (2016). As a non-regulatory committee, GMAC's guidelines are not legally binding and AVA gives final approval.

GMAC's *Guidelines for the Release of Agriculture-Related "GMOs"* provide a common framework to assess risks of agriculture-related GE products to human health & environment and approval mechanisms for their release. Under the guidelines, a proposal has to be submitted to GMAC and its

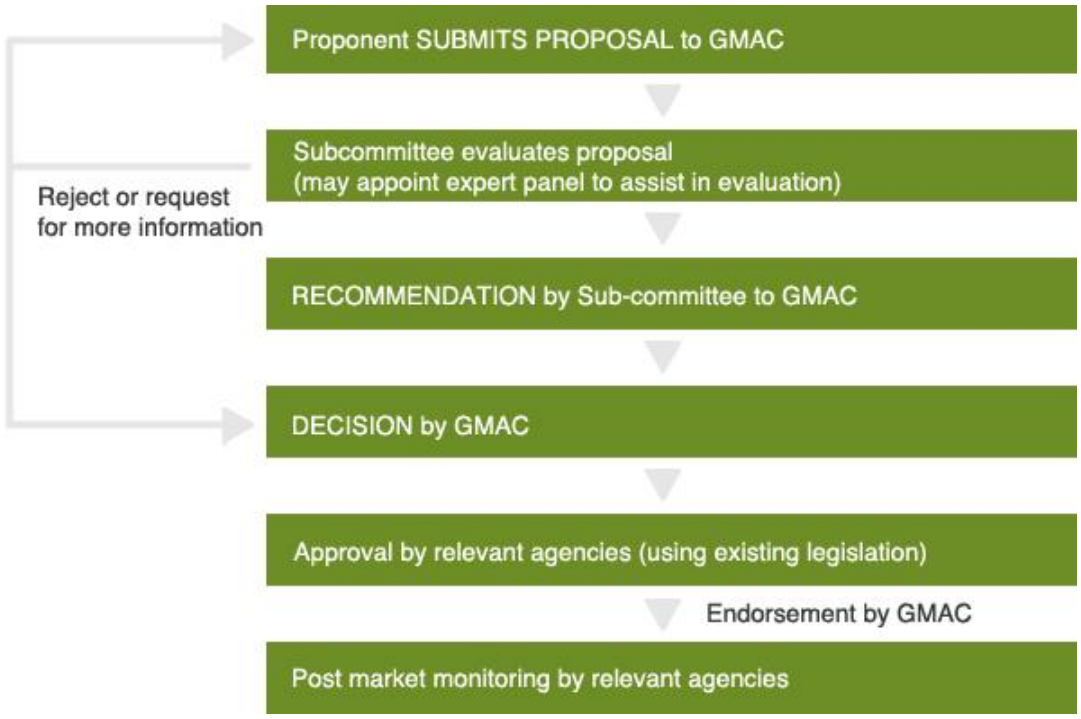
subcommittees (please see details below) who will review the application, including an examination of the GE product's origin, the experimental procedures used in its development and the methods used to prove it is safe for consumption. Following the review process, GMAC decides whether or not to endorse the application. GMAC's decision is then forwarded to AVA, which determines final regulatory approval.

GMAC's members are from local regulatory agencies and academic institutions, and they serve on a voluntary basis. The GMAC Main Committee is currently chaired by Professor Prakash Kumar from the National University of Singapore. The other members come from 12 agencies, including AVA, MOH, the Ministry of Manpower, the National Institute of Education International, the Nanyang Technological University and the Consumer Association of Singapore (CASE). Please click here for information on GMAC and the list of current GMAC Main Committee members.

In addition to the Main Committee, GMAC has four Subcommittees. For details on the Subcommittees and a list of Subcommittee members, please refer to the following:

- Subcommittee for Release of Agriculture –Related "GMOs"(please click here for details)
- Subcommittee for Research on "GMOs" (please click here for details)
- Subcommittee for Labeling of "GMOs" (please click here for details)
- Subcommittee for Public Awareness (please click here for details)

Approval Process for GE Products in Singapore



(Source: GMAC)

For a copy of Singapore's *Guidelines on the Release of Agriculture-related "GMOs",* please

click here.

For a copy of Singapore's *Biosafety Guidelines for Research on "GMOs"*, please click here.

b) APPROVALS:

A total of 35 GE plant products have been approved for use as food or food ingredients in Singapore. For an updated list of the approved events (as of October 2018), please click here (Source: AVA).

c) STACKED OR PYRAMIDED EVENT APPROVALS:

In July 2016, GMAC endorsed a document on stacked events that was prepared by the Subcommittee for Release of Agriculture-related "GMOs". The document, *Risk Assessment for Stacked Events*, was uploaded to the GMAC website in 2017. The document addresses the risk assessment and evaluation of breeding stacked events. For a copy of the document, please click here.

d) FIELD TESTING:

AVA granted approval in 2015 for a local company, JOil (S) Pte. Ltd, to conduct small scale field trials on Semakau Island for GE Jatropha kernels with high oleic acid content for the biofuels industry. Industry contacts report the field trials are still ongoing. The GE plant is not to be introduced (planted) in any other parts of Singapore's environment, and it is also not to be used for propagation in the country.

e) INNOVATIVE BIOTECHNOLOGIES:

Market analysts report Singapore is deliberating on regulatory and ethical issues arising from innovative biotechnologies and has yet to develop a harmonized regulatory framework.

f) COEXISTENCE:

There are no rules on co-existence as there are no GE crops approved for domestic commercial cultivation at this time.

g) LABELING:

Currently, Singapore does not have any specific guidelines on the labeling of GE products. However, according to market analysts, GE labeling is receiving increased public attention and the GMAC Subcommittee for Labeling of "GMOs" was created to consider the issue.

h) MONITORING AND TESTING:

AVA monitors for the presence of GE products in the market. As GE foods are controlled items in the country, they are subject to special declaration, review, inspection and testing procedures implemented by AVA's Food Control Division. This includes taking samples and testing in AVA laboratories. GE product detection methods and reference materials are required by AVA as part of the market access

approval process. There are no precedents on unapproved events in Singapore.

i) LOW LEVEL PRESENCE (LLP):

Singapore does not have a threshold established or specific policy on LLP. However, the country has demonstrated sensitivity to instances of inadvertent release of unapproved events. Additionally, LLP is connected to Singapore's policy on labeling and GMAC is actively monitoring developments on the labeling of GE products internationally.

j) ADDITIONAL REGULATORY REQUIREMENTS:

None at this time.

k) INTELLECTUAL PROPERTY RIGHTS (IPR):

While Singapore does not have any commercial production of GE crops the country does have intellectual property legislation covering patents.

l) CARTAGENA PROTOCOL RATIFICATION:

Singapore is not a party to the Cartagena Protocol on Biosafety.

m) INTERNATIONAL TREATIES and FORUMS:

Singapore is an active member of the Asia-Pacific Economic Cooperation (APEC) forum and Codex Alimentarius. The country is also one of the 16 countries negotiating the Regional Comprehensive Economic Partnership (RCEP) and one of the 11 signatories of the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP). Singapore is also a member of the International Union for the Protection of New Varieties of Plants (UPOV), and the International Plant Protection Convention (IPPC). It is also a member of the Association of South East Asian Nations (ASEAN) and is the lead country for ASEAN's "GM" Food Testing Network (AGMFTN) sub-group that caters to regulatory and scientific exchanges on issues related to GE food analysis.

n) RELATED ISSUES:

Singapore has a multi-pronged strategy to promote food security, with research and development using modern agriculture technologies playing a key role. For example, AVA established the Agriculture Productive Fund (AFP) in 2014 to spur local farmers to boost their yields and raise productivity. Of the $45 million provided, $38 million was allocated for farm capability development to support productivity improvements. The remaining $7 million was earmarked for farms to carryout research and development in innovative production technologies (biotechnology projects were reportedly not included). Additionally, the National Research Foundation awarded an $8.2 million grant for a joint project with the National University of Singapore, the Temasek Life Sciences Laboratory and the International Rice Research Institute to address food security concerns, including the development of climate change adaptable rice strains.

PART C: MARKETING

a) PUBLIC/PRIVATE OPINIONS:

Market analysts report that although cautionary letters and demands for stringent labeling occasionally appear in public forums, overall opposition to GE foods is insignificant in Singapore.

Singapore's position on GE labeling is in tandem with international trends and practices. AVA's fundamental principle is that any labeling must be "practical, scientifically-driven and effectively implementable across countries". AVA and GMAC are expected to continue monitoring international developments closely.

b) MARKET ACCEPTANCE/STUDIES:

In response to a public query on the safe consumption of GE food in Singapore, AVA stated in a 2012 letter that it wanted to assure the public that all commercially available GE products in Singapore have undergone GMAC and AVA safety assessments based on Codex Alimentarius principles. Additionally, GMAC has stated on its website that its objective is to "ensure public safety while maintaining an environment that is conducive for commercial exploitations of "GMOs" and "GMO" derived products".

CHAPTER 2: ANIMAL BIOTECHNOLOGY

PART D: PRODUCTION AND TRADE

a) PRODUCTION DEVELOPMENT:

Singapore's animal biotechnology development is limited to research activities at AVA's Marine Aquaculture Center (MAC) located at St. John's Island. MAC has undertaken several research activities to develop large-scale hatchery technology, including upstream molecular applications, genetic selection to facilitate fish breeding, and the development of fish vaccines & diagnostic kits. Please refer to the following link for details on MAC activities: https://www.ava.gov.sg/about-ava/avas-centres

b) COMMERCIAL PRODUCTION:

There is no commercial production of animal biotechnology in Singapore

c) EXPORTS:

None

d) IMPORTS:

None

e) TRADE BARRIERS:

There is no commercial production or trade in animal biotechnology. As a result, there are no applicable trade barriers.

PART E: POLICY

a) REGULATORY FRAMEWORK:

The approval process for animal biotechnology is the same as the approval process for plant biotechnology (please refer to the PLANT BIOTECHNOLOGY REGULATORY FRAMEWORK section above).

b) APPROVALS:

There are no approved animal biotechnology events for commercial use in Singapore.

c) INNOVATIVE BIOTECHNOLOGIES:

There is no specific regulatory status for innovative biotechnology in animals.

d) LABELING:

Currently, Singapore does not have any specific guidelines on the labeling of GE products. Also, there is no traceability mechanism in effect.

e) INTELLECTUAL PROPERTY RIGHTS (IPR):

There is no current legislation that addresses IPR for animal biotechnologies.

f) INTERNATIONAL TREATIES and FORUMS:

Singapore regularly sends officials to Codex forums.

g) RELATED ISSUES:

None

PART F: MARKETING

a) PUBLIC/PRIVATE OPINIONS:

Few discussions of GE animals, cloned animals or products derived from cloned animals take place in Singapore.

b) MARKET ACCEPTANCE/STUDIES:

FAS Singapore is unaware of any studies on animal biotechnology market acceptance.