Required Report - public distribution

Date: 7/10/2015

GAIN Report Number: SN5003

Singapore

Agricultural Biotechnology Annual

2015

Approved By:
Chris P. Rittgers
Prepared By:
Ira Sugita

Report Highlights:
Singapore has no major import barriers to products containing GE ingredients or products derived from GE crops. There have been no changes to regulations since the Genetic Modification Advisory Committee (GMAC) revised its Biosafety Guidelines Research in January 2013.

Table of Contents

SECTION I. EXECUTIVE SUMMARY:

Singapore imports 90 percent of its food supply. Malaysia, Indonesia, Australia, China, and the United States are the main suppliers of agricultural products. U.S. exports of agricultural products to Singapore in 2014 increased 5 percent from 2013. Last year, the agricultural total was over $795 million compared to $ 754 million in 2013. Leading categories included horticultural products ($322 million), livestock / meats ($147 million) and dairy products ($100 million). Singapore's overall imports of GE material in bulk commodities continue to be negligible; the country does not import U.S. corn and only minimal soybeans. Thus, any imports of GE products would be primarily soy or corn based ingredients contained in further processed products.

Singapore does not produce any agricultural-related GE plants or animals, and there are no current field trials. GE related activities consist of confined laboratory research, primarily related to pharmaceuticals.

The multi-agency Genetic Modification Advisory Committee (GMAC) was established under the country's Ministry of Trade and Advisory in 1999 to oversee and provide science based advice on R&D, production, release, use and handling of GE matters. As an advisory committee, GMAC works closely with other national bodies/regulatory agencies, particularly AVA and MOH. GMAC formulated Guidelines on the Release of Agriculture-Related GMOS (1999) and Biosafety Guidelines for Research on GMOs (2006, revised in 2008 and January 2013). However, as a non-regulatory committee, GMAC's guidelines are not legally binding. AVA gives final approvals.

Singapore focuses on promoting R&D in agro-technology via the establishment of agro-technology parks. The objective is to become a regional hub for agricultural consultancy and for research on seed technology and agro-technology in tropical agriculture and aquaculture. Singapore has also developed an agri-biotechnology park as a center of excellence in tropical agro-technology services; the activities include R&D in fish vaccines, food safety and animal/plant health testing, and post-harvest technology. However, the primary focus is still the biomedical industry, gene therapy, biologics, diagnostics and genetic engineering.

Imported foods must be determined safe by exporting countries' national regulatory bodies and they must comply with international safety standards established by Codex Alimentarius.

SECTION II. CHAPTER 1: PLANT BIOTECHNOLOGY

PART A: PRODUCTION AND TRADE

a) PRODUCT DEVELOPMENT, b) COMMERCIAL PRODUCTION, and c) EXPORTS: Singapore does not cultivate, produce, or export any GE crops.

d) IMPORTS: Singapore imports hardly any GE agricultural products in bulk form. However, it does import a significant quantity of processed foods that contain ingredients (e.g. corn syrup and soybean oil) that were derived from GE grains.

e) FOOD AID RECIPIENT COUNTRY: Singapore does not need and does not receive humanitarian food aid.

PART B: POLICY

a) REGULATORY FRAMEWORK: GMAC published the Guidelines for the Release of Agriculture-Related GE products in 1999 to ensure "the safe import, release and use in Singapore of agriculture-related organisms that have been genetically modified". Essentially, the Guidelines provide a common framework for the assessment of risks of agriculture-related GE products to human health and environment; and also the approval mechanisms for their release.

Under the Guidelines, a proposal has to be submitted to GMAC; then to its Subcommittee on the Release of Agriculture-Related GE products will review the application, including examining the GE's origin, the experimental procedures used in development and the methods used to prove they are safe for consumption. Following the recommendations of the Subcommittee, GMAC will decide whether it will endorse the application. GMAC's decision is then forwarded to AVA, who determines final regulatory approval.

GMAC Committee and Subcommittees: The current GMAC Main Committee is chaired by an official from the National Institute of Education (NIE), with members from 12 different agencies, including AVA, Ministry of Manpower, Ministry of Health, Consumer Association of Singapore, Institute of Molecular and Cell Biology and National Parks Board.

Please click here for the list of current members of the GMAC Main committee and for information on the Committee.
In addition to the main Committee, GMAC has four subcommittees as follows:
•Subcommittee for Release of Agriculture –Related GMOs: please click here for the details.
•Subcommittee for Research on GMOs: please click here for the details.
- Subcommittee for Labeling of GMOs: please click here for the details.
- Subcommittee for Public Awareness: please click here for the details.

- Please click here for a copy of the flowchart for evaluation, approval and registration of agricultural GE in Singapore. (Source: GMAC)

GE Regulatory system in Singapore

- GMAC Guidelines
    - Please click here for a copy of the Singapore Biosafety Guidelines for Research on GMOs (revised January 2013). (Source: GMAC)
        - The Guidelines' objectives are to ensure the safe containment, handling and transport of GEs used in research; and to provide a common framework for assessment/notification of research on GEs.

    - Please click here for a copy of the Singapore Guidelines on the Release of Agriculture-related Genetically Modified Organisms (GMOs). (Source: GMAC)
        - The Guidelines' objectives are to ensure the safe import, release and use of agriculture –related organisms that have been genetically modified. GMAC refers to agriculture-related organisms as "animals (including fish and invertebrates), plants, micro-organisms and vaccines used in cultivation, farming, agronomy, husbandry and horticulture".

- Regulatory Authority for Food
    - Importation and sale of food, including GE Foods: For the application of import of GE foods, a proposal needs to be submitted to GMAC for their safety evaluation. After GMAC has completed their evaluation, AVA will take into consideration GMAC's recommendations and conduct further safety evaluation based on Codex's "Guideline for the Conduct of Food Safety Assessment of Foods Derived from Recombinant-DNA Plants" – please click here for the details.
    - As a general overarching policy on food safety reviews, Singapore regulatory bodies adopt the concept of "substantial equivalence" – i.e. if a new food or food component is found to be substantially equivalent to an existing food or food component, it can be treated to be as safe as the conventional food or food component.

b) APPROVALS: Please click here for the list of approved agricultural GE crops for use as food or food ingredients in Singapore (Source: AVA)

c) FIELD TESTING: AVA approved a local company to conduct a small scale field trial for GE Jatropha curcas (Lines X8#34 and X8#291) with high oleic acid content. The trial will be conducted on Semakau Island, Singapore. The GE plant will not to be introduced (planted) in any other parts of Singapore.

d) STACKED TRAITS: Singapore has prepared a draft on approval of crops containing multiple events or "stacked traits" for the purpose of simplifying the process. The main concern is that the GE crops with multiple events may have to undergo another complete review even if each trait has already been approved individually. However, at this time of writing, nothing has been finalized.

e) ADDITIONAL REQUIREMENTS: None at this time. However, reportedly recently authorities have been taking a considerably longer time to review proposals. Some have attributed the longer review time to a greater emphasis on environmental risk assessment of agriculture-related GEs.

f) COEXISTENCE: Since Singapore grows no GE crops, and scarcely any field production of conventional crops, it has no policy on coexistence.

g) LABELING: There is no specific legislation/guidelines on labeling of GE foods. GMAC subcommittee on labelling was created to consider the issue of labeling of GE products. The issue of labeling is receiving increased public attention and is becoming more contentious. However, in recognition that it is a complex issue, including that there is no internationally agreed upon threshold on GE material in food, Singapore has no plans to draft guidelines on labeling soon.

h) TRADE BARRIERS: 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. 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.

i) INTELLECTUAL PROPERTY RIGHTS (IPR): In Singapore, the onus is on the importers to obtain the necessary patents for their GE products so as to ensure the protection of their IPR.

j) CARTAGENA PROTOCOL RATIFICATION: Singapore is a not a party to the Cartagena Protocol on Biosafety.

k) INTERNATIONAL TREATIES/FORA: Singapore is a member of ASEAN, APEC, Codex and also one of the 12 countries negotiating the Trans Pacific Partnership (TPP). Biotechnology constitutes an important part of the overall discussion on food and agricultural matters in APEC. The country is also a member of the International Union for the Protection of New Varieties of Plants (UPOV).

l) 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, the National Research Foundation recently awarded a $8.2 million grant to a joint project between 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 rice strains that can adapt to climate change. In addition, the Economic Development Board encourages companies to establish centers for research, and several life science companies are doing work on crop varieties appropriate for regional tropical growing conditions.

m) MONITORING AND TESTING: AVA monitors for the presence of GE foods in the market, which includes taking samples and testing in AVA laboratories. AVA's laboratory can detect five specific types of GE events and can also quantify GE content in certain food products.

n) LOW LEVEL PRESENCE POLICY: Singapore has no specific policy per se, but in the past has demonstrated sensitivity to instances of inadvertent release of unapproved events.

PART C: MARKETING

a) MARKET ACCEPTANCE: No significant barriers exist to importing or marketing GE foods in Singapore. In response to a public query on the safe consumption of GE food in Singapore, AVA stated in a 2012 letter that they would like to assure the public that "all GM commercially available in Singapore have undergone safety assessments by both GMAC and AVA based on Codex's principles established by the Food and Agriculture Organization (FAO) and the World Health Organization (WHO)".

b) PUBLIC/PRIVATE OPINIONS: The number of complaints/cautionary letters in public forums has increased, and anti-GE food groups are becoming more vocal. Also, there has been a considerable rise in the number of netizens in the public space calling for a more stringent rule on GE labeling. However, overall there is no major opposition to GE foods in Singapore.

GE Labeling

Singapore's position on GE labeling is in tandem with international trends and practices, and this includes not making it mandatory to label GE foods. However, GE foods – also other food products - must meet existing food labeling requirements in regards to ingredient listing and information in order to facilitate tracing and recall. Companies can voluntarily label food as "GMO" or "non-GMO". Essentially, 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; and Singapore is also working with the Codex Committee on Food Labeling to develop acceptable guidelines on labelling of GE food.

- Public Awareness Campaigns

GMAC has conducted one public event in so far 2015 as part of their ongoing efforts to increase public awareness on GE technology and foods:

- The GMAC Students Challenge, Infographic Poster Exhibition, July, 2015

For this year, GMAC invites secondary schools in Singapore to create an infographic poster based on the theme of "Spy on the GM". Students are to focus on a genetically modified item to introduce the process of gene modification, its implementation in the "real world" and also the risks and benefits associated with it. Through these contests, GMAC aims to promote active learning and stimulate students' interests in GE related topics.

c) MARKETING STUDIES: None at this time

PART D: CAPACITY BUILDING AND OUTREACH

a) ACTIVITIES: In conjunction with the visit to Singapore of USDA officials (from Office of Agreements and Scientific Affairs), the Office of Agricultural Affairs (OAA) in Singapore and in cooperation with biotech group, Croplife Asia (www.croplifeasia.org), organized a dialogue on biotech in early 2015 with major life sciences/biotech companies. The dialogue served as a platform for an interactive discussion on biotechnology matters in Singapore and the region.

b) STRATEGIES AND NEEDS: To educate regulators about the advantages of biotechnology in agriculture and to support implementation of a practical regulatory framework, FAS and interagency partners could potentially do:

- Workshops/seminar: To present information on GE technology and exchange ideas and experiences in cooperation with biotech/life sciences groups and/or private sector.
- Capacity building programs: Use Singapore as the lead country for the ASEAN GE Food Testing Network (AGMFTN). FAS could conduct trainings for other ASEAN countries in Singapore to strengthen their GE food testing capabilities.
- Explore organizing educational events with GMAC.
- Research projects: Collaborate with GMAC on research/evaluation projects.

SECTION II. CHAPTER 2: ANIMAL BIOTECHNOLOGY

a) PRODUCT DEVELOPMENT: Singapore's animal biotechnology can be described as very minimal

at best and constitutes only R&D activities. One of AVA's technical and R&D centers is the Marine Aquaculture Center (MAC), located at St. John's Island. The MAC has undertaken several R&D activities to develop large-scale hatchery technology, including fish biotechnology and other upstream molecular applications – i.e. the genetic selection to facilitate fish breeding, and development of fish vaccines and diagnostic kits.

b) COMMERCIAL PRODUCTION, c) EXPORTS and d) IMPORTS: There is no commercial production/exports/ or imports of GE animals or animal products.

END OF REPORT.