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Report Highlights:
Thailand's biotechnology policies have not changed since 2007 when the Cabinet revoked a field trial for genetically engineered (GE) crops but applied restrictive measures in conducting future field trials. The outcome of the draft Biosafety Legislation, which would create a regulatory framework for genetically engineered (GE) crop cultivation, is still uncertain. Thailand is looking to adopt a positive list of approved GE events for food products.

Executive Summary:

While Thailand's current regulations prohibit the cultivation of genetically engineered (GE) crops, it allows the import of processed food containing GE ingredients, GE soybeans and corn for feed and industrial uses, and GE cotton lint. Thailand's imports of soybeans and cotton from the United States totaled $663 million in 2017, nearly all of which are GE products.

The outcome of the draft Biosafety Legislation, which would create a regulatory framework for GE crop cultivation, is still uncertain. The Ministry of Natural Resources and Environment (MONRE) has elected to try to combine the National Legislative Assembly's (NLA) draft Biosafety Law with the MONRE's draft Biodiversity Law. This draft legislation is still under review by MONRE and does not yet have a timeline for when it will be submitted to the Cabinet for approval.

Additionally, the Thai Food and Drug Administration (TFDA) is considering adopting a mandatory food safety dossier submission for food ingredients derived from GE plants. If this regulation is adopted, the TFDA would create a positive list of approved GE events that would be allowed to be used as food ingredients. The final rule is anticipated to be approved in late 2019.

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PLANT AND ANIMAL BIOTECHNOLOGY

CHAPTER 1: PLANT BIOTECHNOLOGY

PART A: PRODUCTION AND TRADE

a. PRODUCT DEVELOPMENT: Although there were field trials for several transgenic plants varieties in the 1990s, the Thai government issued a blanket ban in 2003 on further field trials after public opposition. In 2007, the Cabinet gave permission for GE crop field trials to be conducted in Thailand under certain restrictions. However, despite the change in regulations, no GE crop field trials have been conducted in Thailand since the 2003 ban. Although Monsanto Thailand planned to conduct a field trial for NK603 herbicide-resistant corn in 2013, this field trial has not taken place after Naresuan University changed its mind on hosting the project. Monsanto, as a result, discontinued the project. In addition, Syngenta Thailand and Pioneer Thailand have also discontinued their projects to conduct greenhouse trials of GE corn seeds.

a. COMMERCIAL PRODUCTION: Thailand has a de facto ban on GE crop cultivation.

a. EXPORTS: As there is no legal domestic cultivation of GE crops, Thailand does not officially export GE products. However, according to the European Union (EU) Rapid Alert System for Food and Feed (RASFF) report, more than 40 shipments of papayas originating from Thailand were detected positive for GE contamination and rejected from 2013-2017. In 2014, the Department of Agriculture (DOA) regulated that all fresh or dried papaya or food products containing papaya exported to the EU and Japan are subject to GE detection testing prior to shipping. In 2016, the DOA set up formal criteria that exporters of Thai fresh papaya must meet in order to export to the EU, Switzerland, Norway, Iceland, China, and Japan.

a. IMPORTS: Thailand limits the importation of GE plants to processed food, soybean and corn for feed and industrial uses, and cotton lint. It is estimated that 95 percent of total soybean imports and 80-90 percent of cotton imports in 2017 came from GE plants. According to the Thai Customs Department, in 2017 Thailand imported $1.2 billion of soybeans and $489 million of cotton from all sources. The same year cotton and soybean imports from the United States totaled $663 million.

a. FOOD AID: Thailand is not a food aid recipient and does not provide food aid on a regular basis. Rice has occasionally been used for disaster relief in other neighboring countries.

a. TRADE BARRIERS: Currently, there are no additional biotechnology-related trade barriers. However, some have expressed concern that if TFDA's creation of a positive list of approved GE events might lead to trade disruptions for certain processed food products as a result of asynchronous regulatory approvals in the United States and Thailand.

PART B: POLICY

a. REGULATORY FRAMEWORK: The four main government agencies involved in the regulation of agricultural biotechnology are the: 1) DOA, Ministry of Agriculture and Cooperatives (MOAC), responsible for regulating imported GE seed for planting, conducting GE research and development, and conducting risk assessment.; 2) National Center for Genetic Engineering and Biotechnology (BIOTEC), Ministry of Science and Technology (MOST), responsible for conducting GE crop research and development including DNA technology laboratory development and providing technical advice and research funding; 3) Ministry of Natural Resources and Environment (MONRE), responsible for drafting the National Biosafety Law and representing as a national focal point for Convention on Biological Diversity (CBD) and Cartegena Protocol on Biosafety (CPB); and 4) TFDA, Ministry of Public Health (MOPH), responsible for regulating and monitoring the use of GE food including labeling and regulating imports of GE-contained food products. In addition, the National Bureau of Agricultural Commodity and Food Standards (ACFS) under MOAC represents the Thai Government in negotiating all SPS issues in international organizations (i.e., World Trade Organization, WTO, Codex, OIE, etc.), including the safety of GE products.

The National Biosafety Committee (NBC) was established in 1993 to serve as a coordination body with Institutional Biosafety Committee (IBC) to develop national biosafety guidelines, to oversee imports of living organisms, to review and direct research methodologies, etc. IBC is an internal organization in various institutions, mainly universities and government agencies, where GE research and development project is conducted. IBC is mainly responsible for controlling and monitoring GE projects in order to comply with national biosafety guidelines. IBC is also required to report project proposals and project evaluations to NBC. However, due to a lack of real field trial activities, the NBC is no longer active. , The review of biosafety issues for GE plants and animals is currently being conducted by the Technical Biosafety Committee (TBC), an ad hoc technical advisor of BIOTEC.

According to the agreement by the Cabinet led by General Surayuth Chulanont in 2007, the proposed Biosafety Act legislation will provide the legal framework regulating the use of agricultural biotechnology including research, field trials, and commercialization. In November 2015, after receiving approval from the Cabinet, the draft Biosafety Act was rejected by the Prime Minister, stating that he did not see the legislation providing any benefit to Thailand.

On November 1, 2016, the Chairman of NLA's Science, Telecommunication, and Public Communication Committee created a new subcommittee to draft a new Biosafety Act. A revised draft was completed on December 27, 2016. The NLA assigned MONRE with task of approving their draft legislation and preparing it for a Cabinet review.

MONRE chose to combine the draft NLA Biosafety legislation with MONRE's draft Biodiversity Law. The draft legislation's definition of biosafety covers environment safety, human health safety, and sustainable biodiversity. Some are concerned that this too-broad definition and the complicated organizational process might impede future GE field trials and GE commercialization. Although the final draft was reportedly completed, there is no timeframe for when it will be submitted to the Cabinet for approval.

a. APPROVALS: Currently, no GE crops have been approved for cultivation nor have any field trials been undertaken. Imports of GE crops are limited to corn, soybean, and cotton for feed and industrial use.

a. STACKED or PYRAMIDED EVENT APPROVALS: No GE crops with stacked or pyramided event have been approved for cultivation thus far. No additional requirements for imports of GE soybeans, corn, and cotton with stacked events for feed and industrial use are applied. Thailand currently lacks a specified regulatory framework for the approval of GE stacked/pyramided events. BIOTEC published its guidelines for safety assessment of GE stacked/pyramided events in 2014, but these guidelines have not been officially adopted by the TFDA, which is the agency responsible for food approval. Further details are discussed in the 'Labeling' paragraph that follows.

a. FIELD TESTING: According to the 2007 Cabinet's criteria, all field trials must be located on government properties, hold public hearings prior to implementation, and obtain approval from the Ministerial Cabinet.

a. INNOVATIVE BIOTECHNOLOGIES: There has been no research study on gene editing in Thailand, and Thailand lacks a regulatory framework for plants developed by this technology.

a. COEXISTENCE: Thailand has not established any framework or guidelines regarding coexistence with non-GE crops.

a. LABELING: The TFDA under the MOPH enforces the labeling requirement for processed foods containing GE plant materials. Effective in 2002, the MOPH lists 22 food products that are subject to labeling requirements when their contents exceed the five percent threshold. The labeling requirements are:

    a. Food containing only one main ingredient should include a statement of "genetically modified" in conjunction with, or in close proximity to, the name of foods such as "genetically modified corn," or "tofu produced from genetically modified soybean," etc.;
    b. For multi-ingredient foods, labels should include a statement of "genetically modified" in conjunction with, or in close proximity to, or under the names of top three main ingredients of the food product such as "genetically modified corn starch," etc.

However, the regulation is not applied to small producers who produce and directly sell to consumers. The products subjected to labeling requirements are:

1. Soybeans
2. Cooked soybeans
3. Roasted soybeans
4. Bottled or canned soybeans or soybeans contained in retort pouch
5. Natto

6. Miso
7. Tofu or tofu fried in oil
8. Frozen tofu, soybean gluten from tofu or its products
9. Soybean milk
10. Soybean flour
11. Food containing product(s) from 1 to 10 as the main ingredient
12. Food containing soybean protein as main ingredient
13. Food containing green soybean as main ingredient
14. Food containing soybean sprout as main ingredient
15. Corn
16. Popcorn
17. Frozen or chilled corn
18. Bottled or canned corn or corn contained in heat-treated pouch
19. Corn flour or cornstarch
20. Snack foods deriving from corn as main ingredient
21. Food containing product(s) from 15 to 20 as the main ingredient
22. Food containing corn grits as main ingredient.

Currently, the TFDA is considering adopting a mandatory food safety dossier submission for food ingredients derived from GE plants. If these regulations are implemented, the TFDA is expected to create a positive list of approved GE events that would be allowed to be used in food ingredients.

The TBC has been assigned to be the TFDA's technical arm for developing guidelines on the minimum requirements for conducting a food safety assessment for food ingredients derived from GE plants. In August 2017, the TBC submitted its guidelines to the TFDA. The guidelines proposed that the approval of GE events should be based on molecular characterization, nutrition, toxicity, and allergenicity. In general, the recommended guidelines align with international standards. For example, the guidelines do not require a full assessment of "stacked" events if each single GE event has already passed a safety assessment.

TFDA has reportedly elected to adopt most of the recommendations and guidelines proposed by TBC into their draft regulations. In addition to concerns over the regulations themselves, there are also concerns about TFDA's capacity to review dossiers. A final rule is anticipated to go into effect in late 2019.

a. MONITORING AND TESTING: Although Thailand has laboratory facilities to test GE products, sources indicate that officials do not closely test or monitor manufacturers' compliance of the biotech food labeling requirements.

a. LOW LEVEL PRESENCE (LLP) POLICY: Thailand has not established any framework or guidelines regarding low level presence.

a. ADDITIONAL REGULATORY REQUIREMENTS: None.

a. INTELLECTUAL PROPERTY RIGHTS (IPR): Seed developers believe that the current Thai Plant Variety Protection Act (PVP) does not fairly protect patents for a new plant

varieties derived from genetic engineering. In particular, the PVP regulates that the use of foreign plant varieties to develop new breed seed in Thailand, including GE crop seeds, is subject to a benefit sharing requirement for local communities. The Thai Seed Trade Association (THASTA) and other stakeholders have been working with MOAC in the past couple years to revise these provisions under the Act to align the PVP Act with the International Union for the Protection of New Variety of Plants' (UPOV) guidelines.

Copyright protection for GE crops is covered under Trademark Act (No.2) B.E. 2543 (2000), which is regulated by the Ministry of Commerce's Department of Intellectual Property.

a. CARTEGENA PROTOCOL RATIFICATION: Thailand signed the Convention on Biological Diversity (CBD) in 1992. Thailand signed the Nagoya-Kuala Lumpur Supplementary Protocol on Liability and Redress to the Cartagena Protocol on Biosafety in March, 2012. In March 2015, the Thai Cabinet approved the Master Plan for Integrated Biodiversity Management B.E. 2558-2564 (2015-2021). The master plan has been implemented under National Biodiversity Targets, which are divided into three phases, i.e. by 2016, by 2020, and by 2021. Details of the master plan and national biodiversity targets can be found in https://www.cbd.int/doc/world/th/th-nbsap-v4-en.pdf.

a. INTERNATIONAL TREATIES and FORUMS: Thailand regularly participates in international organization conventions such as the International Plant Protection Convention (IPPC) and Codex Alimentarius (Codex). However, Thailand has not taken any clear positions on issues relating to GE crops and related products.

a. RELATED ISSUES: The Thai government, especially the MOAC, promotes organic production and self-sufficient agricultural production. Most Thais perceive organic crops as being safer than GE crops and view farmers who adopt self-sufficiency in agricultural production as being less dependent on expensive agricultural practices.

PART C: MARKETING

a. PUBLIC/PRIVATE OPINIONS: The latest survey on this issue available is from 2010. According to the 2010 survey, 66 percent of the 340 surveyed respondents said they would not purchase GE foods. On specific health risks, 40 percent of respondents believed that consumption of GE foods could create an allergic reaction and 56.2 percent believed that consumption could lead to antibiotic resistant diseases. On consumption benefits, 59.7 percent felt that GE foods could enhance food traits while 54.4 percent believed that consumer could pay less for GE foods. Regarding the environment, 68.3 percent believed that GE crops could cause an unbalanced ecosystem, and 75.1 percent agreed that the flow of GE crops into other traditional crops could occur.

a. MARKET ACCEPTANCE/STUDIES: In general, Thai producers, retailers, and consumers remain misinformed about the safety and use of transgenic plants or related foods. Contrary to public perceptions, Thailand consumes large amounts of biotech crops either directly (such as soybean oil) or indirectly (through the garments and processed foods that use biotech inputs). Although mandatory labeling is required for food products with more than

five percent GE content, unpackaged products or products packaged in bulk are exempt from the rules. This has led to public misinformation about the amount of biotech products that they consume.

CHAPTER 2: ANIMAL BIOTECHNOLOGY

PART A: PRODUCTION AND TRADE

a. PRODUCT DEVELOPMENT: Thailand does not engage in the development or production of genetically engineered animals. Cloning research in cattle, buffalo, goats, and pet animals has been conducted in some universities, such as Chulalongkorn University, Kasetsart University, and Suranaree University of Technology, but FAS/Bangkok is unaware of initiatives to develop this technology for commercial purposes.

a. COMMERCIAL PRODUCTION: None.

a. EXPORTS: None.

a. IMPORTS: None.

a. TRADE BARRIERS: Although no regulatory framework on trade has been established, trade of GE animals is subject to a de facto import/export ban.

PART B: POLICY

a. REGULATORY FRAMEWORK: The TBC, an ad hoc technical advisor of BIOTEC, has responsibility for the review of biosafety issues for GE animals.

a. INNOVATIVE BIOTECHNOLOGIES: There has been no research on gene editing in Thailand, and Thailand lacks a regulatory framework for animals developed by this technology.

a. LABELING AND TRACEABILITY: None.

a. INTELLECTUAL PROPERTY RIGHTS (IPR): None.

a. INTERNATIONAL TREATIES and FORUMS: None.

a. RELATED ISSUES: None.

PART C: MARKETING

a. PUBLIC/PRIVATE OPINIONS: There has been no survey on public or private opinions. However, FAS/Bangkok believes that majority of Thai population is not aware developments in animal biotechnology, including both GE and cloned animals. If any, most private

opinions would be negative due to prevailing campaigns by anti-biotech NGOs regularly delivering misinformation to the public.

a. MARKET ACCEPTANCE/STUDIES: FAS/Bangkok believes that market acceptance for the sale and use of livestock clones and GE animals in Thailand is very low and probably non-existent.