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Report Highlights:

In April 2019, the Rural Development Administration (RDA) announced the creation of its Center to Commercialize New Breeding Technologies. This Center will lead Korea's development of innovative biotechnologies including genome editing for seven years beginning in 2020 with a budget of 76 billion Korean won (approximately $63 million USD). Korea is coordinating with relevant ministries to set policy on innovative biotechnologies. There has been no improvement on approval of genetically engineered (GE) products. After the detection of GE wheat in the United States in June 2019, the Ministry of Food and Drug Safety (MFDS) has been testing all incoming wheat and wheat flour from the United States to confirm absence of the unapproved GE wheat event. All tests were negative.

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EXECUTIVE SUMMARY

Korea is heavily dependent on imported food (except rice) and feed grains. A limited number of food products are produced from biotechnology due to negative consumer sentiment. In contrast, the bulk of livestock feed is produced from biotech corn and soybeans. The United States is the top genetically engineered (GE) grain exporter to Korea, followed by Brazil and Argentina. Total U.S. GE grain exports to Korea from January through June 2019 reached 3,025,000 metric tons (MT), out of Korea's total GE grain imports of 5,438,000 MT.

In 2019, Korea's research and development (R&D) investment in the agricultural sector was 992 billion Korean won (approximately $827 million USD), representing a one percent increase over the previous year. Korea's R&D investment in the agricultural sector accounts for five percent of nation's total R&D investment. In 2019, 54 billion Korean won (approximately $45 million USD) will be used to continue R&D for new biotech traits, genome research, system synthesis agricultural biotechnology, and other related activities.

In April 2019, the Rural Development Administration (RDA) announced a new Center to Commercialize New Breeding Technologies. This Center will support improvement of Korea's competitiveness in the field of breeding as one of nation's future growth engines. The Center will lead development and commercialization of products through innovative biotechnologies by investing a total of 76 billion Korean won (approximately $63 million USD) over seven years beginning in 2020. Korea has not issued regulatory policy for products of innovative biotechnologies and is in the process of building consensus among relevant ministries on how best to regulate innovative biotechnologies.

It has been over 10 years since the Korean government established the Living Modified Organism (LMO) Act. Plans are underway to evaluate the LMO Act and prepare improvements to address stakeholders' needs. The Korea Biosafety Clearing House (KBCH) conducted a survey in 2018 to do so, but no progress has been made yet. In 2018, lawmakers submitted several proposed bills in the National Assembly to revise the LMO Act. Many of the proposed bills aimed to tighten the existing requirements; one proposed bill aimed to streamline the current biotech product approval process by eliminating redundant regulatory reviews by multiple agencies. None of the proposed bills have made progress due to an extended political stalemate in the National Assembly.

Since 2017, Korea has required mandatory GE labeling for any food products that contain detectable GE ingredients with exemptions for cooking oils and syrups. Some lawmakers and anti-biotech non-government organizations (NGOs) have advocated for European Union-like labeling standards since 2000. In 2018, NGOs' petitioned the Blue House, the executive office and official residence for Korea's head of state, to expand GE labeling to all products made of

GE ingredients, including those that cannot be detected as containing GE ingredients. In response, a consultation body of NGOs and the food industry was formed in December 2018 to come up with a new GE labeling rule that meets both parties' needs. After nine meetings, the anti-biotech NGOs ceased to participate, and both parties failed to narrow gaps in their positions on GE labeling.

In June 2019, USDA Animal and Plant Health Inspection Service (APHIS) reported detections of GE wheat in Washington. In response, Korea's Ministry of Food and Drug Safety (MFDS) began testing all U.S.-origin wheat and wheat flour for the presence of MON71300, a variety of GE wheat. All tests produced negative results. Trade was not disrupted in the aftermath of this detection. FAS/Seoul was able to communicate with relevant regulators, including MFDS, and the industry and will continue to do so if necessary.

In 2018, a consumer survey on gene scissors – an innovative biotechnology technique – indicated that 32 percent of respondents were aware of this new technology. Of those that were aware, 60 percent believed that gene scissors should be regulated due to concerns over safety and unintentional effects.

Useful Acronyms

APQA: Animal and Plant Quarantine Inspection Agency
ERA: Environmental Risk Assessment
GE: Genetically Engineered
GMO: Genetically Modified Organism
KBCH: Korea Biosafety Clearing House
LMO: Living Modified Organisms
MAFRA: Ministry of Agriculture, Food, and Rural Affairs
MOE: Ministry of Environment
MFDS: Ministry of Food and Drug Safety
MHW: Ministry of Health and Welfare
MOTIE: Ministry of Trade, Industry and Energy
NAQS: National Agricultural Products Quality Management Service
NFRDI: National Fisheries Research & Development Institute
NIAS: National Institute of Animal Science
NIE: National Institute of Ecology
NSMA: National Seed Management Agency
RDA: Rural Development Administration

CHAPTER 1: PLANT BIOTECHNOLOGY

Part A. Production and Trade

A) Product Development

In Korea, the development of modern biotechnology (biotech henceforth) products that can be genetically engineered (GE), is led by various government agencies, universities, and private entities. Research is mainly focused on second and third generation traits, such as drought and disease resistance, nutrient enrichment, transformation techniques, and gene expression. From January to May 2019, the Rural Development Agency (RDA) has approved a total of 182 research cases for field trials conducted by RDA's designated evaluation entities and private entities.

In 2019, Korea had 90 events in 14 different varieties of products under development. These products include:

- resveratrol enriched rice
- vitamin A enriched rice
- insect resistant rice
- environmental stress tolerant rice
- virus resistant pepper
- vitamin E enriched beans
- insect resistant beans
- herbicide tolerant bentgrass
- virus resistant potatoes
- Chinese cabbage
- watermelon
- sweet potato
- apple

Safety assessment data is currently being generated for four events in two products: three for beans and one for bentgrass. Jeju National University developed an herbicide tolerant bentgrass under RDA's Next Generation Bio-Green 21 Project that was submitted to RDA for an environmental risk assessment (ERA) in December 2014 and is still under review. In 2016, the resveratrol enriched rice, known to be an antioxidant polyphenol, received approval for health and medical use from the Ministry of Health & Welfare (MHW). This product was initially developed for food use, but due to push back from anti-biotech NGOs and local rice farmers, RDA did not approve it for food use. Instead, they limited production of resveratrol produced by GE rice to those using cell culture only and in January 2018, received approval from MHW for use in pharmaceuticals or cosmetics.

In 2010, a team from the Korea Research Institute of Bioscience and Biotechnology, a government research institute developed drought-resistant sweet potatoes that also tolerate saline soils to surmount the effects of desertification. They were successfully grown in China's Kubuchi Desert and Kazakhstan, two of the largest semi-arid areas in northeast Asia. In 2014, they also started the genome decoding process for sweet potatoes in coordination with Chinese

and Japanese researchers. With decoded information, the team aims to grow a large amount of biotech sweet potatoes in areas affected by desertification in China, the Middle East, and Africa.

Although significant research has been completed, the earliest the regulatory review process for one of these products (most likely herbicide-resistant bentgrass) could be completed is in five years. Commercialization is expected to take much longer and will face continued opposition from anti-biotech NGOs and local farmer groups. Without stronger support and advocacy from Korean farmers, commercialization of GE crops in Korea will not likely occur. Farmer support for actively using this technology is key to increasing consumer confidence in biotech food.

In September 2017, RDA acquiesced to local anti-biotech non-government organizations (NGOs)' request that the government stop plans to commercialize genetically engineered (GE) products in Korea. RDA also dismantled their team leading GE product development, the National Center for Genetically Modified (GM) Crops. It was renamed the Agricultural Biotechnology Research Center. This was in response to long-term pressure exerted by NGOs to stop GE rice field trials and commercialization. Anti-biotech groups welcomed this change, and Korean researchers and politicians that support the use of biotech criticized RDA's decision. Korean research groups expressed concern that RDA bowed to pressure from anti-biotech NGOs, which will have a negative impact on Korea's GE research.

Under the agreement, RDA formed a committee with the NGOs to consult on GE research plans. However, RDA has not stopped conducting GE research. RDA continues to develop GE products as in the past, but they have improved transparency regarding the development of GE products. RDA advocated for continuing GE research by arguing that, first, GE is a necessary tool for Korea to deal with climate change, and second, Korea imports and regulates GE products. Therefore, Korea should continue research on the requisite technology. RDA continues to fund GE research teams under the second phase of the Next Generation Bio-Green 21 Project.

In May 2015, RDA released results of the first phase of the Next Generation Bio-Green 21 Project, which aimed to develop and commercialize biotechnology. With a total investment of 271.4 billion won (approximately $236 million USD), RDA decoded genomes for nine organisms, including pepper and ginseng, and developed anthracnose-resistant pepper and other products between 2011 and 2014. RDA will invest another 300 billion won (approximately $260 million USD) by 2020 to develop additional projects. Given that these projects have multiyear timelines and budgets, RDA intends to continue the efforts, notwithstanding the commercialization agreement with the anti-biotech NGOs referenced above.

Korea published its 3rd LMO Safety Management Plan in December 2017, which aims to:

- Establish an emergency response team for unintentional release incidents of GE events

- Further develop an effective biotech management system
- Prepare a safety management plan for innovative biotechnologies
- Improve the LMO Act
- Other related tasks

In 2018, the plan went into effect for five years. Korea will spend 82 billion Korean won (approximately $75 million USD) over five years to implement the LMO Safety Management Plan.

B) Commercial Production

Despite substantial investment, Korea has yet to commercially produce any biotech products. In 2017, RDA, the leading government research agency, announced that they would not commercially produce biotech products in Korea in response to continued pressure from domestic anti-biotech NGOs.

C) Exports

Korea does not export any biotech crops as Korea does not commercially produce any GE products.

D) Imports

Korea imports biotech products for food, feed, and processing but not for cultivation. The United States, followed by Brazil, is the largest supplier of biotech grains and oilseeds to the Korean market. In the year through June 2019, the United States was the largest supplier of biotech products followed by Brazil and Argentina.

In calendar year 2018, Korea imported a total of 10.2 million metric tons (MT) of corn, which consisted of 7.8 million MT for feed and 2.4 million MT for processing. Imports from the U.S. reached 6.7 million MT or 66 percent of the total. Imports of U.S. corn were comprised of 5.8 million MT for animal feed – nearly all biotech – and 0.9 million MT for processing – nearly 100 percent was biotech.

Imported biotech corn for processing is generally used to make products like high fructose corn syrup or corn oil. Whether for feed or food, both are exempt from GE labeling requirements because the GE protein is undetectable. Despite mounting pressure from anti-biotech NGOs and consumer groups, some processors continue using biotech corn because it is more affordable and easier to source than conventional corn.

In 2018, Korea imported a total of 1.24 million MT of soybeans, three-quarters of which were for crushing. The United States was the largest soybean supplier to Korea, exporting 693,448 MT or about 55 percent of all soybean imports. Of that amount, 529,170 MT were used for

crushing and 164,278 MT for food processing or sprouting. Brazil was the second largest soybean supplier to Korea in 2018, exporting 472,279 MT.

Soybean oil is exempt from GE labeling requirements because the GE protein is undetectable. Soybeans for food processing – used in products such as tofu, bean paste, and bean sprouts – are primarily conventional varieties.

Table 1 below contains import statistics for biotech grains and oilseeds. This data differs slightly from the numbers reported in the preceding paragraphs because it is based on import approvals instead of customs clearance. As demonstrated in the table, Korea imports a significant volume of LMO[1] grains and oilseeds for both food and feed. For more information on Korea's feed grain and oilseeds production, supply, and demand, please see the latest reporting in the GAIN system.

Table 1: Imports Statistics for LMO Soybeans and Corn (Calendar year basis / Unit: 1,000 MT)

Classification			2015	2016	2017	2018	2019 Jan-Jun
			Volume	Volume	Volume	Volume	Volume
Soybean	Food (Crushing)	US	273	384	397	576	472
		Non-US	756	598	646	473	0
		Total	1,029	982	1,043	1,049	472
Corn	Food	US	354	630	703	989	434
		Non-US	762	392	536	169	120
		Total	1,116	1,022	1,239	1,158	554
	Feed	US	2,994	3,715	3,558	6,137	2,046
		Non-US	4,942	3,847	3,610	1,714	2,277
		Total	7,936	7,562	7,168	7,851	4,323
Oilseeds	Feed	US	75	16	119	131	73
		Non-US	81	159	32	21	16
		Total	156	175	151	152	89

Source: Korea Biosafety Clearing House

E) Food Aid

Korea is not a food aid recipient. Korea has provided intermittent food aid to North Korea, depending on prevailing political conditions. Korea participates in the Association of Southeast Asian Nations (ASEAN) Plus Three Emergency Rice Reserve (APTERR), which was

1 The term "LMO" is used here and elsewhere in the report to refer to GE product as "living modified organisms" because Korea uses this term to report import data.

established in 2013 to provide member countries with rice in the event of natural disasters. Korea has provided 90,000 metric tons (MT) of rice to date out of their 150,000 MT commitment. In January 2018, Korea joined the Food Assistance Convention, which allows Korea to draw down its rice stocks that are currently held in storage.

In 2018, Korea shipped 50,000 MT of domestic rice to four countries, through the World Food Program (WFP), including 17,000 MT to Yemen, 15,000 MT to Ethiopia, 13,000 MT to Kenya, and 5,000 MT to Uganda. In the same year, Korea shipped 10,000 MT of domestic rice to Vietnam APTERR. In 2019, Korea again shipped 50,000 MT of domestic rice through the WFP, including 19,000 MT to Yemen, 16,000 MT to Ethiopia, 10,000 MT to Kenya, and 5,000 MT to Uganda. In the same year, Korea shipped 500 MT of domestic rice to Myanmar and Laos each through APTEER. Korea plans to allocate more rice if there is an emergency request.

F) Trade Barriers

There has been growing concern over the approval and risk assessment process for biotech products for food, feed and processing (FFP). Specifically, some reviewing agencies involved in the risk assessment process are considered by industry to be redundant; five agencies are involved in the approval of a single product. There are also concerns that data requirements can lack scientific justification or relevance to the products' intended use. The approval process can be slow, contributing to delays in U.S. farmers access to tools and technology. See a further discussion of this issue below under Part B: Policy, B) Approvals.

Additionally, Korea maintains a zero-tolerance policy for the inadvertent presence of biotech ingredients in processed organic-labeled products. In accordance with the Ministry of Food and Drug Safety (MFDS)' food labeling requirements, MFDS applies a zero-tolerance policy. Despite hope that Korea would revise this policy when updating for the Ministry of Agriculture, Food and Rural Affairs (MAFRA)'s new certification program for processed organic products in 2014, MAFRA adopted MFDS' zero tolerance policy in their final regulation. Any suppliers of organic products that test positive for GE material at any level must remove an organic claim from the product label. The National Agriculture Product Quality Service (NAQS) may also investigate the case to see if the violation was intentional. Shippers of U.S. processed organic products that are accompanied with NAQS Import Certificate are not required to provide additional documents to be exempt from mandatory biotech labeling in Korea.

Part B: Policy

A) Regulatory Framework

Korea ratified the Cartagena Protocol on Biosafety (CPB) on October 2, 2007. On January 1, 2008, Korea implemented the LMO Act, which is the implementing legislation for the CPB and overarching law governing CPB parties' biotechnology-related rules and regulations.

The LMO Act has a lengthy history prior to implementation. In 2001, the Ministry of Trade, Industry and Energy (MOTIE, formerly the Ministry of Knowledge Economy [MKE]), is the competent national authority for LMO Act and spearheaded drafting the LMO Act and its implementing regulations. In 2005, after several years and numerous iterations, MOTIE published drafts for public comment. While the text of the LMO Act and lower level regulations were finalized in March 2006, the regulations were not implemented until January 1, 2008 after National Assembly ratification of the CPB.

After several attempts and continued pressure from the United States, the LMO Act was revised in December 2012, including a revised definition of stacked events. However, this revision failed to address U.S. concerns regarding redundant regulatory reviews and did not distinguish between products intended for FFP and cultivation. The revised Act went into effect on December 12, 2013 after National Assembly approval.

Roles & Responsibilities of Government Ministries

Ministry	Role and Responsibilities
MOTIE	National competent authority for the CPB, responsible for the LMO Act and issues related to the development, production, import, export, sales, transportation, and storage of biotech products for industrial use.
Ministry of Foreign Affairs (MOFA)	National point of contact for the CPB
MAFRA	Possesses authority for matters related to the import or export of agricultural, forestry, or livestock biotech products.
RDA (overseen by MAFRA)	Conducts ERAs and consultations for biotech products and leading developer of biotechnology products in Korea.
Animal and Plant Quarantine Agency (APQA) (overseen	Conducts import inspection of biotech products for agricultural use at the port of entry

by MAFRA)	
NAQS (overseen by MAFRA)	Handles import approval of biotech products for feed use.
Ministry of Oceans and Fisheries (MOF)	Possesses authority for matters related to the trade of maritime biotech products including risk assessments
MHW	Possesses authority for matters related to the import or export of biotech products used for health and pharmaceutical purposes, including human risk assessments.
Korea Center for Disease Control and Prevention (overseen by MHW)	Oversees human risk consultation for biotech products.
MFDS (under the Prime Minister's Office)	Possesses authority for matters related to the import or export of biotech products for food, pharmaceutical, and medical devices, food safety approvals of biotech products, and the enforcement of labeling requirements for non-processed and processed food products containing biotech ingredients.
Ministry of Environment (MOE)	Possesses authority for issues related to the trade of biotech products that are used for the purpose of environmental remediation or release into the natural environment, including risk assessments, not including biotech products for cultivation.
National Institute of Ecology (NIE) (overseen by MOE)	Handles import approval of biotech products under jurisdiction of MOE and environmental risk consultation
Ministry of Science, Information	Possesses authority for issues related to the trade of biotech products that are used for testing and research, including risk assessments.

Communication Technology and Future Planning	

Role and Membership of the Biosafety Committee

In accordance with Article 31 of the LMO Act, a Biosafety Committee was formed in 2008 under the Prime Minister's Office, which was chaired by the Prime Minister. In keeping with the LMO Act revision issued in 2012, the Biosafety Committee was moved under MOTIE in 2013 and chaired by the MOTIE minister. The change of the Biosafety Committee chair was not intended to downgrade the status of the committee but to achieve more effective and efficient operation. The Biosafety Committee reviews the following, as relevant to the import and export of biotech products:

- Factors relevant to the implementation of the Cartagena Protocol
- Establishment and implementation of the safety management plan for biotech products
- Re-examination in accordance with the provisions of Article 18 and Article 22 of appeals by an applicant that is denied import approval, etc.
- Factors relevant to legislation and notification pertinent to the safety management, import, and export, etc. of biotech products
- Factors relevant to the prevention of damage caused by biotech products, if any, and measures taken to mitigate damage caused by biotech products, if any
- Factors requested for review by the chair of the Biosafety Committee or the head of the competent national authority

The Biosafety Committee is comprised of 15-20 members, including vice ministers from the seven relevant ministries noted above and the Ministry of Planning and Finance. Private sector specialists, such as professors from Korean universities, can also be members of the Biosafety Committee. The Biosafety Committee may have subcommittees and technical committees.

The most important role of the Biosafety Committee is to reconcile different positions among the relevant ministries. Each relevant ministry holds authority and responsibility in its respective area, and it is the MOTIE minister's role as the chair to resolve matters lacking consensus. The Biosafety Committee is only believed to have met formally once in April 2018 but has also conducted meetings through document circulation. A technical committee consisting of experts from relevant ministries also gathers to discuss specific issues, for example to discussion mitigation measures following detection of unapproved GE canola. The technical committee meets six times a year and also follows the status of risk assessments and consultation reviews.

Political Influence

Regulatory decisions related to agricultural biotechnology are influenced by political pressure, mostly from anti-biotech NGOs, some of which are appointed to the government's food safety

and biotechnology risk review committees. Anti-biotech NGOs use this position to pressure the government to introduce stricter biotech regulations, such as a draft revision to the Food Sanitation Act that would require GE labeling for any product including biotech grain.

B) Approvals

Whether grown domestically or imported, biotech products are required to undergo a food safety assessment and an ERA. MFDS conducts the food safety assessment, consulting with RDA, NIE and NFRDI. The ERA is also referred to as a feed approval; although, the review is largely focused on the environmental impact not animal health. RDA conducts the ERA, consulting with NIE, NFRDI, and Korea Center for Disease Control and Prevention.

The overlap between agencies and redundant data requirements have caused confusion and unnecessary delays in the approval process. In 2015, in response to continued requests to streamlining the process, Korea introduced a pilot project called "Joint Consultation Review Committee", which combined NFRDI and NIE committees. Only one event was reviewed in 2016 under the pilot project.

The results of the pilot project demonstrated few efficiencies were achieved. However, in 2017, Korea proposed another pilot program called the "Committee on Additional Data Requests", which Korea believed would reduce additional information requests by convening a monthly meeting among five reviewing agencies. Like the previous pilot program, there were no significant improvements, as each agency continues to request additional information.

As of October 2019, MFDS has granted food safety approval for 201 events, including 171 plant products, 24 food additives, and six microorganisms. RDA has approved 160 products for use in feed. See Appendix for a complete list of approved events.

C) Stacked or Pyramided Event Approval

Following substantial, long-term engagement from the United States, MFDS no longer requires a full safety assessment for stacked events, if they meet the following criteria:

- The traits being combined were already approved individually
- There is no difference in the given traits, intake amount, edible parts, and processing method in the stacked event and the conventional non-biotech counterpart; And/or
- There is no crossbreeding among subspecies.

Similarly, after engagement from the U.S., the revised Consolidated Notice – the official implementation regulations for the LMO Act – limited requirements for RDA to conduct an ERA for stacked events. RDA only requires an ERA if there is interaction between traits in the inserted nucleic acid of the parental line or other differences are noticed. However, concerns remain over delays and additional information requests by MFDS and RDA for stacked events.

D) Field Testing

From January to May 2019, a total of 182 field trials were approved, and in 2018, RDA authorized contained field trials for 285 products. RDA renews the field trial permits every year. According to the Consolidated Notice, field trials are required for imported biotech products used as seed, and RDA will review the data from field trials conducted in the exporting country for those used as FFP. However, RDA may require field trials for FFP use. Products subject to field trials must follow RDA's "Guidelines for Research and Handling of Recombinant Organisms Related to Agricultural Research" and should adhere to voluntary guidelines published by MHW, entitled "Guidelines for Research of Recombinant Organisms."

E) Innovative Biotechnologies

Despite industry urging, Korea has not issued a policy on how to regulate products made through innovative biotechnologies (e.g. genome editing). Korea is closely watching policy developments in other countries.

F) Coexistence

As biotech crops are not yet grown in Korea and as such, there are no co-existence policies. However, farmer groups have demanded more government oversight over imports and movement of GE crops in Korea to prevent any avoidable release of GE crops following several reports of GE corn volunteers near Korean feed mills.

G) Labeling

In 2017, in accordance with a revision to the Food Sanitation Act, MFDS implemented new mandatory GE labeling requirements that expanded labeling to all detectable products. MFDS is responsible for enforcement of GE labeling guidelines for the purpose of consumers' right to know. Unprocessed and certain processed human food products containing GE ingredients must carry "genetically modified" (GM) food labels. Currently, there are very few products on the market with a "GM" label.

Exempted products include cooking oil, sugar (glucose, fructose, taffy, sugar syrups, etc.), soy sauce, modified starch, and alcoholic beverages (beer, whisky, brandy, liqueur, distilled spirits, etc.). Supporting document are not required for exemptions from GE labeling requirements for these products. The revised rule also exempts processing aids, such as enzymes, carriers, diluents, and stabilizers derived from biotech from GE labeling, but manufacturers are required to provide documentation.

For products that contain or may contain detectable GE ingredients, examples of labels are as indicated in Table 2. For more information, please see 2017 GAIN "Biotech Labeling Requirement Update" from the FAS GAIN Site.

Table 2: Cases and examples of GE labeling.

Cases	Examples	
GE grains or oilseeds	"GM corn" or "GM soy"	
Products containing GE grains or oilseeds	"Containing GM corn" or "Containing GM soy"	
Vegetables grown from GE grains	"Beansprout grown from GM Soy"	
Products containing vegetable from GE grains	"Containing beansprout grown from GM soy"	
May contain GE grains/oilseeds	"May contain GM corn" or "May contain GM soy"	
May contain vegetable from GE grains	"May contain beansprout grown from GM soy"	
Food product with detectable GE component (labeled on either principal display panel or ingredient panel)	Principal Display Panel	"GM Food", "GM Food Additive", "GM Health Functional Food", "Food product containing GM soy", "Food additives containing GM corn", or "Health

		functional food containing GM corn”
	Ingredient Panel	“GM” or “GM soy” or “GM corn” in parentheses next to a name of raw ingredient on the ingredient panel
Food products containing GE ingredients from multiple sources	Principal Display Panel	“May contain GM corn and soy”
Food products for which detectable GE component is uncertain.	Principal Display Panel	“May contain GM soy” or “May contain GM corn”
	Ingredient Panel	“May contain GM soy” or “May contain GM corn” in parentheses next to a name of raw ingredient on the ingredient panel

Korea allows for up to three percent unintentional presence of approved GE components in unprocessed conventional products that carry an identity preserved or government certificate. Only negative test results issued by an MFDS-accredited laboratory is accepted. Intentional mixture of GE ingredients requires GE labeling even if the final presence of biotech/GE ingredients is within the three percent threshold.

Table 3: Unintentional GE Presence and “GM” Labeling

	Threshold	Label
Conventional Bulk Grain Shipments Containing Unintentional GE Presence		
with IP or government certificate	3%	“GMO” label is exempted.
without IP or government certificate	0%	“GMO” label shall be affixed.
Processed Products Containing Unintentional GE Presence		
with IP or government certificate	3%	“GMO” label is exempted.
without IP or government certificate	0%	“GMO” label shall be affixed.
Bulk Grains and Processed Products Containing Intentional GE Presence		
“GMO” label shall be affixed.		
Processed product containing no foreign DNA, such as syrups, oils, alcohols and processing aids		
Exempt from mandatory “GMO” labeling without any further documentation required.		

MFDS has been conducting a safety assessment for a GE potato event. Potatoes and any products containing potato-derived ingredients will be subject to mandatory GE labeling as soon as MFDS approves the GE potato event. Additionally, companies marketing conventional

potatoes and processed products containing conventional potato-derived ingredients will be required to submit documents to receive an exemption from mandatory GE labeling.

Anti-biotech NGOs continue to pressure MFDS to expand GE labeling to any products containing GE ingredients. Previously, MFDS attempted to expand GE labeling, but it was not implemented following feedback from the local industry. In 2018, the Korean government recommended the establishment of a consultation body to discuss GE/biotech labeling, comprised of NGOs and food industry representatives. There were nine meetings, but parties failed to narrow their differences.

In April 2007, MIFAFF (a previous title of MAFRA) revised its Feed Manual requiring retail packaged animal feed products to carry a "GMO" label when the product contains biotech ingredients. This labeling requirement was enforced beginning on October 11, 2007. There have been no reported problems due to the fact that nearly all animal feed products contain biotech ingredients and are therefore subject to this labeling requirement.

The 2017 revision to the Food Sanitation Act also prohibited a "non-GMO" or "GMO-free" claim on products that do not have GE counterparts. However, it allows for voluntary "non-GMO" or "GMO-free" claims for products that do not contain any trace of a GE component (foreign DNA or protein). This voluntary claim is permitted when the contents of raw ingredients subject to GE labeling are 50 percent or higher or when such ingredient is the top ingredient in volume of the product. Importers must keep relevant documentation to support the voluntary claim, which can include a testing certificate issued by MFDS accredited testing laboratories. For more information, please see GAIN reports KS1716, KS1004, and KS1046 in the FAS GAIN Report site.

H) Monitoring and Testing

Korea actively tests for GE traits in imports and domestically. MFDS and the Animal and Plant Quarantine Inspection Agency (APQA) test imported GE products for GE traits upon arrival. MFDS and NAQS also test food products and feed grains in the marketplace for GE traits respectively. If an unapproved trait is found, the products will be returned or destroyed.

In 2009, NIE (formerly the National Institute of Environmental Research, NIER), under MOE, began monitoring for imported GE canola, corn, cotton, and soybean in domestic cultivation. NIE, as the designated ERA agency, collected and tested samples countrywide and concluded that GE FFP imports were inadvertently released during transportation in Korea.

In 2013, the National Seed Management Agency (NSMA) under MAFRA began executing Korea's monitoring for unapproved GE products in imports and domestically. NSMA is the agency approving and regulating domestic and imported seeds. In 2017, NSMA detected the

first unapproved GE product (canola) in imports and found the unapproved GE canola in 56 locations in Korea. Shortly after in 2017, the NIE, the agency monitoring adventitious environmental release of GE products, detected unapproved GE cotton growing domestically. (Note: Cotton is grown as an ornamental in some Korean gardens and not as a commodity crop.)

In 2018, NSMA heightened inspection of imported grain seed by increasing sample size and testing samples of canola and cotton seeds before planting. By 2022, NSMA plans to expand this pre-planting testing to soy, corn, wheat, and flaxseed. In the past, MFDS and APQA have tested for unapproved GE events in shipments of imported corn, papaya, rice, and wheat. Some testing is random (Liberty Link rice); other testing is mandatory (wheat and papaya).

I) Low Level Presence (LLP) Policy

Korea does not have an LLP policy for unapproved biotech products in biotech shipments. Instead, Korea has an "adventitious presence" policy that allows as much as 0.5 percent of the content of a conventional feed shipment to contain unapproved biotech products

J) Additional Regulatory Requirements

For GE products intended for FFP, no additional registration is required other than an approval. For GE products for propagation, the product should complete a seed approval as well as GE approval for cultivation by submitting local field trials data.

K) Intellectual Property Rights (IPR)

Although Korea does not allow for domestic cultivation of GE products, there are intellectual property rights protection under existing domestic regulations.

L) Cartagena Protocol Ratification

Korea ratified the CPB in 2007 and implemented the LMO Act, the legislation implementing the CPB, in 2008. The first revision of the LMO Act was issued in 2012, which went into effect in 2013. MOTIE revised its implementing regulations to harmonize with the LMO Act in 2013 revisions and the Consolidated Notice in 2014. The revision sought to improve the approval process, but MOTIE failed to fully address concerns related to the redundant reviews. After long-term engagement from the United States about concerns from domestic industry and foreign trading partners on language used to implement the CPB, in 2013, Korea began allowing exporters to provide a list of all biotech products approved for use in Korea on the commercial invoice. Importers can use the same list in the import application form, which has reduced trade disruptions.

M) International Treaties and Forums

Korea is actively participating in Codex, International Plant Protection Convention, Asia-Pacific Economic Cooperation, World Trade Organization, Organization for Economic Co-operation

and Development, and other meetings on GE plants. Korea notifies the WTO of their proposed changes and gather comments from trading partners. Korea applies substantial equivalence principles of Codex in their safety assessment process.

N) Related Issues
No further issues.

Part C: Marketing

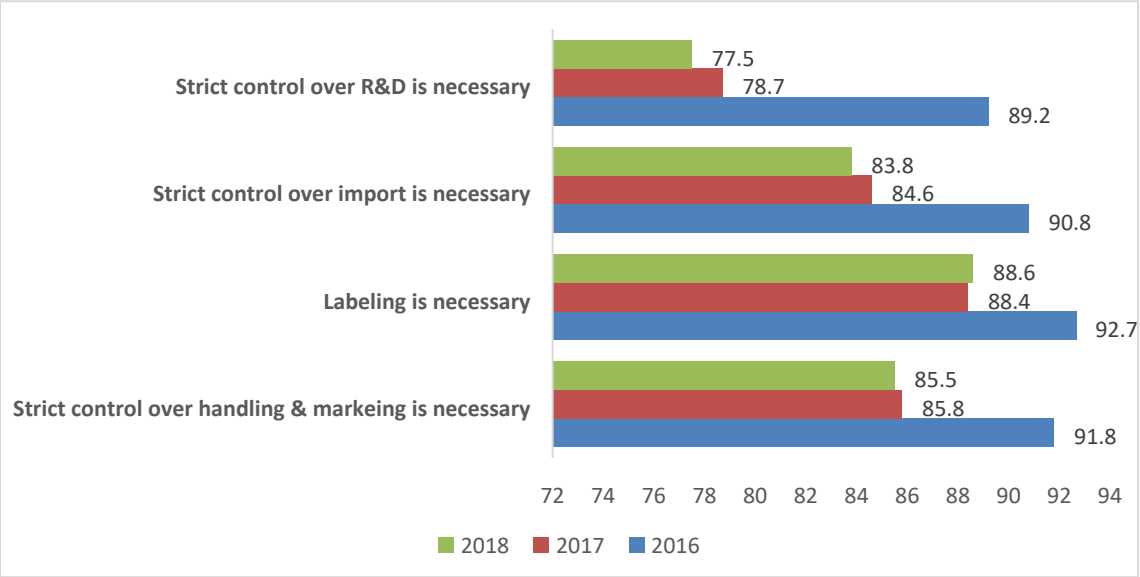
A) Public/Private Opinions
Consumers are sensitive and generally negative towards the use of agricultural biotech and are willing to pay more for non-GE food, according to the results of surveys conducted by local researchers presented in public meetings. The 2013 detection of GE wheat in Oregon alarmed Korean consumers, who perceived it as inadequate management of GE production in the United States. The detection gave momentum to a civic group called the "Citizens Coalition for Economic Justice", which have demanded expanded GM labeling. This organization is active with the National Assembly and MFDS. In light of these sensitivities, many domestic food manufacturers are reluctant to use biotech ingredients and are likewise reluctant to carry GM-labeled foods. Repeated detections of GE wheat in Washington in 2016 and 2019 reinforced the perception that management of GE production in the U.S. is not adequate and that future incidents may occur. Nonetheless, Korea imports substantial amounts of biotech ingredients for further processing into products that are exempt from GM labeling. The general public seems unaware of this fact. In general, the Korean public supports biotech industries and research institutes that develop technologies, given the local predisposition to support new technologies.

B) Market Acceptance/Studies
There are contradictory views about biotech in Korea. The public holds positive views on the use of biotech for animals or medical purposes but are negative towards its use in in agriculture. This was demonstrated in 2018 though the results of KBCH's tenth annual survey of 800 Korean consumers' perceptions of biotech.

Survey results showed that consumer awareness has remained high, and perceptions have improved substantially from the previous year. Sixty-five percent answered that biotech would be beneficial to humans, which was down from 69 percent in 2017; only six percent answered to the contrary. Nearly half who answered that biotech is beneficial answered that it was beneficial to curing diseases, such as cancer, and 28 percent answered that it might help solve food shortage issues. Of those who answered it was not beneficial, 39 percent questioned the safety to humans, and 39 percent thought that biotech would have a harmful effect on the environment.

For innovative biotechnologies, including gene scissors, 32 percent of the respondents were aware of this new technology. Seventy-four percent and 68 percent of the respondents supported its use in the medical/pharmaceutical and bio-industry sectors, respectively. Forty-six percent and 44 percent support its use in the food/agriculture and livestock sectors. Although many respondents supported its use, 60 percent answered that innovative biotechnologies should be regulated due to safety and unintentional effects.

Figure 1: Korea's perspective on biotech regulations



Source: Korea Biosafety Clearing House

Around 73 percent of respondents answered that research and development (R&D) was necessary, and almost 50 percent answered that it was necessary for Korea to grow biotech crops. Nearly a third answered that it was necessary for Korea to raise biotech animals domestically. About 20 percent responded that it was necessary for Korea to import biotech products from foreign countries. Over 88 and 83 percent were in favor of labeling and strict import controls on biotech products, respectively.

A quarter were interested in biotech products, but 47 percent of these respondents were interested because of safety concerns. Respondents obtained information on biotech products mostly from the internet, followed by TV.

CHAPTER 2: ANIMAL BIOTECHNOLOGY

Part A. Production and Trade

A) Product Development

Korea is actively using genetic engineering to develop animals that can produce new biomedicines and bio-organs. Korea is also using cloning technology to expand the number of animals with a high capacity to produce biomedical products. The research is being led by various public and private entities, including academia. In January 2019, RDA announced its annual work plan that included the creation of a future growth engine using agricultural technology, such as research on pig cornea transplants to monkeys. In June 2019, RDA obtained a U.S. patent to produce transgenic pigs as an Alzheimer's disease model to help identify the causes of Alzheimer's and aid in drug screening. RDA has since transferred their technique to a company that specializes in stem cell/cell therapy products.

In January 2018, RDA announced a three-year cooperation project with the National Swine Resource and Research Center in the U.S. to introduce a management system to control pathogens, a training program, and technology to carry out research on transgenic animals. RDA believes that this project will help standardize the management system of transgenic animals and produce bio and pharmaceutical materials through transgenic animals.

Since 2010, the National Institute of Animal Science (NIAS) of RDA has been focusing on the development of new biomedical materials, such as bio-organs, diversity of animal genetic resources, value-added livestock products, and renewable energy using livestock resources, with the goal of becoming a "world G7 livestock technology country." NIAS is conducting research to develop 36 different traits in two animals: 24 traits in swine and 12 traits in poultry. These traits are designed to produce high-value protein and antivirus materials, swine-producing material that can treat anemia, hemophilia, and thrombus, and chickens producing eggs with lactoferrin and antioxidant substances.

RDA is also conducting research to develop four different traits using silk worm. Traits under development will enable production of silk in various natural colors, immune peptides that replace antibiotics in animal feed, and medicine for humans. In 2018, RDA announced that they developed "Fluorescent silk" using a transgenic silk worm. RDA plans to continue additional research to use fluorescent silk in bio sensors, functional fabric, materials for semi-conductors, and more. NIAS also supplied 48 cloned, special purpose dogs, such as detection or sniffer dogs, to other agencies in Korea. Currently, RDA does not have any plan to develop GE or cloned animals for food use.

In 2018, MAFRA announced details on how to carry out the 2nd Overall Plan for Promotion of Science and Technology for Agriculture, Forestry and Food. MAFRA invested 91 billion Korean won (approximately $90 million USD) in agri-bio resources in 2018, which covered production of pigs for bio-organs, mass production of bio-energy source, and high-value pharmaceutical materials, among others.

In 2010, MAFRA (formerly Ministry of Food, Agriculture, Forestry and Fisheries: MIFAFF) announced its plan for future growth engines for the life science industry in Korea. Biomedicine is one of the areas where considerable resources are being invested. RDA's 10-year Next Generation Bio-Green 21 Project launched on May 19, 2011 focuses on development of biomedicines and bio-organs through transgenic pigs as one of the three top sectors.

In 2013, MAFRA announced a mid and long-term plan to promote agriculture technology to develop bio-materials and transform animals for the production of pharmaceutical products as a sub-project under four major research areas, including:

1) strengthening global competitiveness
2) creating a new growth engine
3) ensuring a stable supply of food grain
4) improving public happiness

MAFRA and RDA will continue to develop new bio-materials using animal biotechnology.

Private entities are also developing GE animals that produce high-value protein pharmaceuticals, such as pigs producing milk expressing a human growth hormone gene. Others are developing transgenic cattle that can produce lactoferrin and insulin, a fluorescent dog for human disease research, chickens that purportedly produce substances to treat leukemia, and mini-pigs for production of bio-organs. In 2015, professors from Korean and Chinese universities announced that they made a pig with higher muscle content using gene editing. The team removed a gene called MSTN, which inhibits muscle growth, from a somatic cell and cloned pigs using nuclear transplantation with the edited gene.

B) Commercial Production

Like biotech plants, Korea does not domestically produce any GE animals, and future domestic production is uncertain. Korean researchers are relatively unwilling to engage in research on GE animals for food use due to concerns about consumer acceptance.

C) Exports

Korea does not export any biotech animals.

D) Imports
Korea imports GE mice for research purposes.

E) Trade barriers
In 2017, MFDS initiated mandatory testing of imported salmon due to reports of GE salmon raised in Panama and marketed in Canada. This testing applied to fresh and frozen salmon originating from the U.S., Canada, and Panama. From October 10, 2017 through December 31, 2017, every import of salmon per manufacturer were tested with no positive detections. Following this period, MFDS conducts random testing of five percent of incoming fresh and frozen salmon from the U.S., Canada, and Panama.

Part B. Policy

A) Regulatory Framework
The LMO Act and its implementing regulations also apply to GE animals, but no specific regulations have been established for the management of GE animals. Pharmaceuticals produced from GE animals are governed by the Pharmaceuticals Affairs Act.

B) Approvals
MAFRA is responsible for the approval of GE animals but has not approved any. MFDS is responsible for the safety evaluation of GE animals and fishery products for human consumption under its GE safety evaluation guidelines.

C) Innovative Biotechnologies
Despite growing interest, Korea has not issued a policy on how to regulate animals produced through innovative biotechnologies (e.g. genome editing). Korea is closely watching policy developments in other countries.

D) Labeling and Traceability
MAFRA is responsible for the labeling of GE animals but has not yet established any regulations. MFDS is responsible for the labeling of food products containing ingredients originating from GE animals in accordance with MFDS Labeling Requirements for GM Food.

E) Intellectual Property Rights
Although Korea does not import or domestically produce GE animals, there are intellectual property rights protection under existing domestic regulations.

F) International Treaties and Forums

Korea actively participates in Codex, World Organization for Animal Health (OIE), APEC, and other meetings but not specifically related to GE animals or fishery products. Korea applies substantial equivalence principles of Codex in their safety assessment process.

F) Related Issues
No related issues have been identified.

Part C: Marketing

A) Public/Private Opinions

Many Koreans believe that biotechnology is an important industry for Korea's economic development. Proponents have had some success in making economic, development, public health, and environmental arguments in favor of biotech. Korea continues to expand investment in R&D for biomaterial, biomedicine, bio-organs, and gene therapy, among others. However, consumers maintain a negative perspective of biotech used to produce animal or fishery products for food.

B) Market Acceptance/Studies
There are contradictory views about biotech in Korea. The public holds positive views on the use of biotech for animals or medical purposes but are negative towards its use in in food. This was demonstrated in 2018 though the results of KBCH's tenth annual survey of 800 Korean consumers' perceptions of biotech. In the 2018 KBCH consumer survey, only 34 percent of respondents answered that Korea needs domestic production of GE animals, which is lower than the 50 percent that answered that Korea needs domestic production of GE plants.

APPENDIX: APPROVED EVENT LIST

TABLE OF APPROVED BIOTECHNOLOGY PRODUCTS AS OF October 2019

Note: Biotechnology products are required to undergo a food safety assessment and an ERA.

Crop	Event	Applicant	Trait	Approval	Approval Date
Soybean	GTS40-3-2	Monsanto	Herbicide Tolerance (HT)	Food & Feed	2010* & 2004
Soybean	MON89788	Monsanto	HT	Food & Feed	2019* & 2009
Soybean	A2704-12	Bayer	HT	Food & Feed	2019* & 2009
Soybean	DP-356043-5	DuPont	HT	Food & Feed	2010 & 2009
Soybean	DP-305423-1	DuPont	High oleic	Food & Feed	2010
Soybean	A5547-127	Bayer	HT	Food & Feed	2011
Soybean	CV127	BASF	HT	Feed & Food	2011 & 2013
Soybean	MON87701	Monsanto	IR	Food & Feed	2011
Soybean	MON87769	Monsanto	SDA	Feed & Food	2012 & 2013
Soybean	MON87705	Monsanto	High oleic	Feed & Food	2012 & 2013
Soybean	MON87708	Monsanto	HT	Feed & Food	2012 & 2013
Soybean	DP-305423-1 X GTS40-3-2	DuPont	High oleic, HT	Food & Feed	2011
Soybean	MON87701 X MON89788	Monsanto	HT, Insect Resistance (IR)	Feed & Food	2012
Soybean	MON87705 X MON89788	Monsanto	High oleic, HT	Food & Feed	2013 & 2014
Soybean	MON87769 X MON89788	Monsanto	HT	Food & Feed	2013 & 2015
Soybean	FG72	Bayer	HT	Feed & Food	2013 & 2014
Soybean	MON87708 X MON89788	Monsanto	HT	Food & Feed	2013 & 2014
Soybean	SYHT0H2	Syngenta	HT	Food & Feed	2014
Soybean	DAS-68416-4	Dow	HT	Food & Feed	2014
Soybean	DAS-44406-6	Dow	HT	Food & Feed	2014
Soybean	DAS-81419-2	Dow	IR, HT	Food & Feed	2016
Soybean	DAS-68416-4 X MON89788	Dow	HT	Food & Feed	2015 & 2016
Soybean	MON87751	Monsanto	IR	Food & Feed	2016
Soybean	FG72 X A5547-	Bayer	HT	Food & Feed	2016

	127				
Soybean	MON87705 X MON87708 X MON89788	Monsanto	High oleic, HT	Food & Feed	2016 & 2017
Soybean	MON87751 X MON87701 X MON87708 X MON89788	Monsanto	IR, HT	Food & Feed	2017
Soybean	DAS-81419-2 X DAS-44406-6	Dow	IR, HT	Food & Feed	2017 & 2018
Soybean	MON87708 X MON89788 X A5547-127	Monsanto	HT	Food & Feed	2017 & 2018
Soybean	DP-305423-1 X MON87708 X MON89788	Dupont	HT, High oleic	Food	2018
Corn	MON810	Monsanto	IR	Food & Feed	2012* & 2004
Corn	TC1507	DuPont	HT, IR	Food & Feed	2012* & 2004
Corn	GA21	Monsanto	HT	Food & Feed	2010 & 2007
Corn	NK603	Monsanto	HT	Food & Feed	2012* & 2004
Corn	Bt 11	Syngenta	HT, IR	Food & Feed	2013* & 2006
Corn	T25	Aventis / Bayer	HT	Food & Feed	2003 & 2004
Corn	MON863	Monsanto	IR	Food & Feed	2003 & 2004
Corn	Bt176	Syngenta	HT, IR	Food & Feed	2003 & 2006
Corn1)	DLL25	Monsanto	HT	Food	2004
Corn1)	DBT418	Monsanto	HT, IR	Food	2004
Corn	MON863 X NK603	Monsanto	HT, IR	Food & Feed	2004 & 2008
Corn	MON863 X MON810	Monsanto	IR	Food & Feed	2004 & 2008
Corn	MON810 X GA21	Monsanto	HT, IR	Food	2004
Corn	MON810 X NK603	Monsanto	HT, IR	Food & Feed	2004 & 2008
Corn	MON810 X MON863 X NK603	Monsanto	HT, IR	Food & Feed	2004 & 2008
Corn	TC1507 X NK603	DuPont	HT, IR	Food & Feed	2004 & 2008
Corn	Das-59122-7	DuPont	HT, IR	Food & Feed	2005

Corn	Mon88017	Monsanto	HT, IR	Food & Feed	2006 & 2016
Corn	Das-59122-7 X TC1507 X NK603	DuPont	HT, IR	Food & Feed	2006 & 2008
Corn	TC1507 X Das-59122-7	DuPont	HT, IR	Food & Feed	2006 & 2008
Corn	Das-59122-7 X NK603	DuPont	HT, IR	Food & Feed	2006 & 2008
Corn	Bt11 X GA21	Syngenta	HT, IR	Food & Feed	2006 & 2008
Corn	MON88017 X MON810	Monsanto	HT, IR	Food & Feed	2006 & 2008
Corn2)	Bt10	Syngenta	HT, IR	Food	2007
Corn	MIR604	Syngenta	IR	Food & Feed	2017* & 2008
Corn	MIR604 X GA21	Syngenta	HT, IR	Food & Feed	2008
Corn	Bt11 X MIR604	Syngenta	HT, IR	Food & Feed	2007 & 2008
Corn	Bt11 X MIR604 X GA21	Syngenta	HT, IR	Food & Feed	2008
Corn	Mon89034	Monsanto	IR	Food & Feed	2019* & 2009
Corn	Mon89034 X Mon88017	Monsanto	HT, IR	Food & Feed	2009
Corn	Smart stack	Monsanto/ Dow	HT, IR	Food & Feed	2009
Corn	Mon89034 X NK603	Monsanto	HT, IR	Food & Feed	2010 & 2009
Corn	NK603 X T25	Monsanto	HT	Food & Feed	2010 & 2011
Corn	Mon89034 X TC1507 X Nk603	Monsanto/ Dow	HT, IR	Food & Feed	2010 & 2011
Corn	MIR162	Syngenta	IR	Food & Feed	2010 & 2008
Corn	DP-098141-6	DuPont	HT	Food & Feed	2010
Corn	TC1507 X Mon810 X NK603	DuPont	HT, IR	Food & Feed	2010
Corn	TC1507 X DAS-591227 X Mon810 X NK603	DuPont	HT, IR	Food & Feed	2010
Corn	Bt11 X MIR162 X MIR604 X GA21	Syngenta	HT, IR	Food & Feed	2010 & 2011
Corn	Event3272	Syngenta	Functional trait	Food & Feed	2011
Corn	Bt11 X MIR162 X GA21	Syngenta	HT, IR	Feed & Food	2011 & 2012

Corn	TC1507 X MIR604 X NK603	DuPont	HT, IR	Food & Feed	2011
Corn	MON87460	Monsanto	Drought Resistance (DR)	Feed & Food	2011 & 2012
Corn	Bt11 X DAS-591227 X MIR604 X TC1507 X GA21	Syngenta	HT, IR	Feed & Food	2011 & 2013
Corn	TC1507 X DAS-591227 X MON810 X MIR604 X NK603	DuPont	HT, IR	Food & Feed	2012
Corn	Bt11 X MIR162 X TC1507 X GA21	Syngenta	HT, IR	Feed & Food	2012
Corn	3272 X Bt11 X MIR604 X GA21	Syngenta	HT, IR	Feed & Food	2012 & 2013
Corn	MON87460 X MON89034 X NK603	Monsanto	DR, HT, IR	Feed & Food	2012 & 2013
Corn	MON87460 X MON89034 X MON88017	Monsanto	DR, HT, IR	Feed & Food	2012 & 2013
Corn	MON87460 X NK603	Monsanto	DR, HT	Feed & Food	2012 & 2013
Corn	TC1507 X MON810 X MIR162X NK603	DuPont	HT, IR	Feed & Food	2013
Corn	5307	Syngenta	IR	Feed & Food	2013
Corn	Bt11 X MIR604 X TC1507 X 5307 X GA21	Syngenta	IR	Food & Feed	2013 & 2014
Corn	Bt11 X MIR162 X MIR604 X TC1507 X 5307 X GA21	Syngenta	IR	Food & Feed	2013 & 2014
Corn	MON87427	Monsanto	HT	Feed & Food	2013 & 2014
Corn	MON87427 X MON89034 X	Monsanto	HT, IR	Food	2014

	NK603				
Corn	MON87427 X MON89034 X MON88017	Monsanto	HT, IR	Food	2014
Corn	TC1507 X MON810 X MIR604 X NK603	DuPont	HT, IR	Food & Feed	2014
Corn	DAS-40278-9	Dow	HT	Food & Feed	2014
Corn	GA21 X T25	Syngenta	HT	Food & Feed	2014
Corn	TC1507 X MON810	DuPont	IR, HT	Food & Feed	2014
Corn	DP-004114-3	DuPont	IR, HT	Food & Feed	2014
Corn	3272 X Bt11 X MIR604 X TC1507 X 5307 X GA21	Syngenta	IR, HT, α-amylase	Food & Feed	2014 & 2015
Corn	MON89034 X TC1507 X MON88017 X DAS-59122-7 X DAS-40278-9	Dow	IR, HT	Food & Feed	2014 & 2015
Corn	TC1507 X MON810 X MIR162	DuPont	IR, HT	Food & Feed	2015
Corn	NK603 X DAS-40278-9	Dow	HT	Food & Feed	2015
Corn	MON87427 X MON89034 X TC1507 X MON88017 X DAS-59122-7	Monsanto	IR, HT	Food & Feed	2015
Corn	DP-004114-3 X MON810 X MIR604 X NK603	DuPont	IR, HT	Food & Feed	2015
Corn	MON89034 X TC1507 X NK603 X DAS-40278-9	Dow	IR, HT	Food & Feed	2015
Corn	Bt11 X MIR162	Syngenta	IR, HT	Food & Feed	2016 & 2015
Corn	MON87427 X	Monsanto	IR, HT	Food & Feed	2016

	MON89034 X MIR162 X NK603				
Corn	MON87411	Monsanto	IR, HT	Food & Feed	2016
Corn	Bt11 X TC1507 X GA21	Syngenta	IR, HT	Food & Feed	2016
Corn	Bt11 X MIR162 X MON89034 X GA21	Syngenta	IR, HT	Food	2016 & 2017
Corn	MON87403	Monsanto	Increased corn ear	Food & Feed	2017 & 2016
Corn	MON87419	Monsanto		Food	2017
Corn	MON87751 X MON87701 X MON87708 X MON89788	Monsanto		Food	2017
Corn	MON87427 X MON89034 X TC1507 X MON87411 X DAS-59122-7	Monsanto	IR, HT	Food & Feed	2017
Corn	MON87427 X MON89034 X MIR162 X MON87411	Monsanto	IR, HT	Food & Feed	2017
Corn	VCO-01981-5	Genective	HT	Food & Feed	2018 & 2017
Corn	MZHG0JG	Syngenta	HT	Food	2017
Corn	MON89034 X TC1507 X MIR162 X NK603	Dow	HT, IR	Food & Feed	2017 & 2018
Corn	MON89034 X MIR162	Monsanto	IR	Food & Feed	2017
Corn	Bt11 X MIR162 X MON89034	Syngenta	HT, IR	Food & Feed	2017 & 2018
Corn	Bt11 X MIR162 X MIR604 X MON89034 X 5307 X GA21	Syngenta	HT, IR	Food & Feed	2017 & 2018
Corn	MON87427 X MON87460 X	Monsanto	HT,IR	Food & Feed	2018 & 2017

	MON89034 X TC1507 X MON87411 X DAS-59122-7				
Corn	MON89034 X TC1507 X MIR162 X NK603 X DAS-40278-9	Dow	HT, IR	Food & Feed	2018
Corn	MON87427 X MON89034 X MIR162 X MON87419 X NK603	Monsanto	HT, IR	Food & Feed	2018
Corn	MON87427 X MON89034 X MON810 X MIR162 X MON87411 X MON87419	Monsanto	HT, IR	Food	2019
Cotton	Mon531	Monsanto	IR	Food & Feed	2013* & 2004
Cotton	757	Monsanto	IR	Food & Feed	2003 & 2004
Cotton	Mon1445	Monsanto	HT	Food & Feed	2013* & 2004
Cotton	15985	Monsanto	IR	Food & Feed	2013* & 2004
Cotton	15985 X 1445	Monsanto	HT, IR	Food & Feed	2004 & 2008
Cotton	531 X 1445	Monsanto	HT, IR	Food & Feed	2004 & 2008
Cotton	281/3006	Dow Agro Science	HT, IR	Food & Feed	2014* & 2008
Cotton	Mon88913	Monsanto	HT	Food & Feed	2006 & 2016
Cotton	LLCotton 25	Bayer	HT	Food & Feed	2005
Cotton	Mon88913 X Mon15985	Monsanto	HT, IR	Food & Feed	2006 & 2008
Cotton	Mon15985 X LLCotton 25	Bayer	HT, IR	Food & Feed	2006 & 2008
Cotton	281/3006 X Mon88913	Dow Agro Science	HT, IR	Food & Feed	2006 & 2008
Cotton	281/3006 X Mon1445	Dow Agro Science	HT, IR	Food	2006
Cotton	GHB614	Bayer	HT	Food & Feed	2010
Cotton	GHB614 X	Bayer	HT	Food & Feed	2012 & 2011

	LLCotton 25				
Cotton	GHB614 X LLCotton 25 X 15985	Bayer	HT, IR	Feed & Food	2011 & 2013
Cotton	T304-40 X GHB119	Bayer	HT, IR	Feed & Food	2012 & 2013
Cotton	GHB119	Bayer	HT	Feed & Food	2012 & 2013
Cotton	COT67B	Syngenta	IR	Feed	2013
Cotton	GHB614 X T304-40 X GHB119	Bayer	HT, IR	Food & Feed	2013
Cotton	COT102	Syngenta	IR	Food	2014
Cotton	281/3006 X COT102 X MON88913	Dow	IR, HT	Food & Feed	2014 & 2015
Cotton	MON88701	Monsanto	HT	Food & Feed	2015
Cotton	GHB614 X T304-40 X GHB119 X COT102	Bayer	IR, HT	Food & Feed	2015
Cotton	MON88701 X MON88913 X MON15985	Monsanto	IR, HT	Food & Feed	2015
Cotton	COT102 X MON15985 X MON88913	Monsanto	IR, HT	Food & Feed	2015 & 2016
Cotton	DAS-81910-7	Dow	HT	Food & Feed	2016
Cotton	COT102 X MON15985 X MON88913 X MON88701	Monsanto	IR, HT	Food & Feed	2016
Cotton	MON88701 X MON88913	Monsanto	IR, HT	Food & Feed	2016 & 2017
Cotton	281/3006 X COT102 X MON88913 X DAS-81910-7	Dow	IR, HT	Food & Feed	2017 & 2016
Cotton	T304-40 X GHB119 X COT102	BASF	IR, HT	Feed	2018
Canola	RT73 (GT73)	Monsanto	HT	Food & Feed	2013* & 2005

Canola	MS8/RF3	Bayer	HT	Food & Feed	2005 & 2014
Canola	T45	Bayer	HT	Food & Feed	2005
Canola1)	MS1/RF1	Bayer	HT	Food & Feed	2005 & 2008
Canola1)	MS1/RF2	Bayer	HT	Food & Feed	2005 & 2008
Canola1)	Topas19/2	Bayer	HT	Food & Feed	2005 & 2008
Canola	MS8	Bayer	HT, Male sterility	Feed & Food	2012 & 2013
Canola	RF3	Bayer	HT	Feed & Food	2012 & 2013
Canola	MON88302	Monsanto	HT	Feed & Food	2014
Canola	MON88302 X RF3	Monsanto	HT	Food & Feed	2014 & 2015
Canola	MON88301 X MS8 X RF3	Monsanto	HT	Food & Feed	2014 & 2015
Canola	MS8 X RF3 X RT73	Bayer	HT	Food & Feed	2015
Canola	DP-073496-4	DuPont	HT	Food & Feed	2015
Canola	DP-073496-4 X RF3	DuPont	HT	Food & Feed	2017
Canola	MS11	BASF	HT, Male sterility	Food	2019
Potato1)	SPBT02-05	Monsanto	IR	Food	2004
Potato1)	RBBT06	Monsanto	IR	Food	2004
Potato1)	Newleaf Y (RBMT15-101, SEMT 15-02, SEMT 15-15)	Monsanto	IR, Virus Resistance (VR)	Food	2004
Potato1)	Newleaf Plus (RBMT21-129, RBMT21-350, RBMT22-82)	Monsanto	IR, VR	Food	2004
Sugar beet	H7-1	Monsanto	HT	Food	2006 & 2016
Alfalfa	J101	Monsanto	HT	Food & Feed	2017 & 2008
Alfalfa	J163	Monsanto	HT	Food & Feed	2017 & 2008
Alfalfa	J101, J163, (J101 X J163 3)	Monsanto	HT	Food & Feed	2007 & 2008
Alfalfa	KK179	Monsanto	Reduced lignin	Food & Feed	2015
Alfalfa	KK179 X J101	Monsanto	Reduced lignin, HT	Food & Feed	2018 & 2016

Total Food Approval: 171

Total Feed Approval: 160
* Food approval has been renewed 10 years after the first approval
1) MFDS conditional approval for discontinued items
2) MFDS conditional approval for items that are not intended for commercialization
3) MFDS conditional approval as other category and adventitious presence is accepted

Attachments:

No Attachments