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Report Highlights:

FAS Accra observes Ghana making appreciable advancements in the field of plant biotechnology (biotech). The country is expanding its agricultural biotech crops developmental and production capabilities. On July 25, 2024, Ghana's National Biosafety Authority (NBA) released for commercial use the country's first indigenously developed biotech crop, the pod borer-resistant cowpea (PBR cowpea), or the Bt cowpea (Vigna unguiculata L. Walp.), event 709A. Commercial production of PBR cowpea, or Bt cowpea, is expected to begin in 2025. There is currently no restriction on the import of genetically engineered (GE) products or products containing bioengineered material.

EXECUTIVE SUMMARY

For successive Ghanaian governments, food security has been a national priority. Faced with strong growth in food demand resulting from rapid demographic shifts and changing consumption habits, Ghana imports food from all over the world to help meet its domestic needs.[1] Ghana's major trading partners in Africa include Côte d'Ivoire, Egypt, Kenya, Morocco, Senegal, and South Africa. Food imports from Asia, Australia, Europe, New Zealand, North and South America are also common on the Ghanaian market.

The Ghanaian government recognizes the potential of biotechnology as a critical innovation in the quest for bettering food security. The current administration's flagship initiative, "Planting for Food and Jobs" phases I and II (PFJ and PFJ 2.0) both seek to improve food security by increasing domestic production of critical food crops such as corn, rice, and soybeans.[2] Provision and usage of improved inputs are a crucial part of this initiative. While not explicitly stated in the initiative, biotechnology can be a vital tool in achieving the government's goals.

A Legal Instrument (L.I.) was passed in June 2019 outlining the implementation of the **Biosafety Act, 2011 (Act N. 831)** provisions. This provides guidelines to institutions such as the Institutional Biosafety Committees and offers procedures for the uptake of the technology from research to commercial release.

A Ghanaian Human Rights Court has dismissed the suit filed by an anti-genetic engineering (GE) group against the National Biosafety Authority (NBA) and four others over the introduction of "genetically modified organisms" and products derived from bioengineering in the country. The judgment, handed on May 24, 2024, comes after nine years of legal tussle. The same court had earlier (April 30, 2024) thrown out an application by the same anti-GE group, seeking interlocutory injunction on the approval of some 14 GE crop products to be imported for food, feed, and industrial processing.

The NBA has authorized the commercial release of the pod borer-resistant (PBR) cowpea, or the Bt cowpea. Controlled field trials (CFTs) for the bruchid- (weevil) resistant cowpea are still underway. Commercial production of the recently released PBR cowpea, or Bt cowpea, is expected to begin in 2025.

There is currently no restriction on the import of GE products or products containing bioengineered material. Ghana imports food and feed products that may contain biotechnology elements. Similarly, Ghana imports and exports alcoholic beverages, dairy products, and processed products which may contain microbial biotech-derived food ingredients.

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[1] Ghana population of 34.6 million (Central Intelligence Agency, 2024 estimate), is young (56 percent is under 25 years-of-age) and growing at 2.15 percent. The urban population accounts for 59.2 percent (2023) of the national population. The rate of urbanization in the country is growing at 3.06 percent annual rate of change [2020-25]. See, USDA/FAS Accra, "GAIN-GHANA | GH2024-0011 | Ghana Retail Foods Annual – 2024," located at: https://apps.fas.usda.gov/newgainapi/api/Report/DownloadReportByFileName?fileName=Retail%20Foods%20Annual_Accra_Ghana_GH2024-0011

[2] See, USDA/FAS Accra, "GAIN-GHANA |GH2023-0014 | Ghana Launches Planting for Food and Jobs Phase II," located at https://apps.fas.usda.gov/newgainapi/api/Report/DownloadReportByFileName?fileName=Ghana%20Launches%20Planting%20for%20Food%20and%20Jobs%20Phase%20II_Accra_Ghana_GH2023-0014.pdf.

TABLE OF CONTENTS

CHAPTER 1: PLANT BIOTECHNOLOGY

PART A: PRODUCTION AND TRADE

a) Research and Product Development

FAS Accra (Post) observes Ghana making appreciable advancements in the field of plant biotechnology (biotech). The country is expanding its agricultural biotech crops developmental and production capabilities.

On July 25, 2024, Ghana's National Biosafety Authority (NBA) released for commercial use the country's first indigenously developed biotech crop, the pod borer-resistant cowpea (PBR cowpea), or the Bt cowpea (*Vigna unguiculata L. Walp*.), event 709A.[3] This genetically engineered (GE) crop has been developed to resist the spotted pod borer (*Maruca vitrata*) pest, which lowers crop yields by boring the pods.[4] Research work on a bruchid- (weevil) resistant cowpea is also progressing.[5] The NBA has also authorized the Biotechnology and Nuclear Agriculture Research Institute's (BNARI's) to commence genome editing of rice, targeting disease resistance (i.e., against the yellow mottle virus) and drought tolerance.

Five applications for research on biotech crops were received by the National Biosafety Committee (NBC), the predecessor of the National Biosafety Authority. Applications for a Nutrient-Enhanced sweet potato and the Nitrogen-Use-Efficient (NUE) rice were submitted by the Council for Scientific and Industrial Research's (CSIR's) Crop Research Institute (CRI). Additionally, the CSIR's Savanna Agricultural Research Institute (SARI) submitted applications for Bt cowpea, Bt cotton, and insect resistant and herbicide tolerant stacked traits cotton, which the research institution refers to as "genetically modified" (GM) cotton. The NBA has also received an application for Nitrogen-Use Efficient, Water-Use Efficient, and Salt Tolerant (NEWEST) rice from the CSIR-CRI.

Research work on the NUE rice ended with no significant difference observed between the experimental and control variables. Consequently, CSIR-CRI opted against seeking NBA approvals for environmental release and market placement. Trials for the Nutrient-Enhanced sweet potato, Bt

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[3] Bt cowpea, which is cowpea that has been genetically altered to express one or more proteins from the bacterium *Bacillus thuringiensis* (Bt).

[4] This pod borer-resistant cowpea, is a new variety of black-eyed beans, resulting from over a decade of regulatory, laboratory, and field testing by the Council for Scientific and Industrial Research – Savannah Agricultural Research Institute (CSIR-SARI) under the PBR Cowpea Project. This public-private partnership, coordinated by the African Agricultural Technology Foundation (AATF), aims to enhance cowpea productivity and utilization in sub-Saharan Africa. On June 30, 2022, the National Biosafety Authority (NBA) of Ghana approved the release into the environment and market of the GE crop Bt cowpea (*Vigna unguiculata L. Walp*.), event 709A, under development by the CSIR-SARI. The approval lasts for ten years and can be renewed. Field testing for this event began in Ghana in 2016. The pest target is the Maruca pod borer (*Maruca vitrata*), which can reduce cowpea yields by 20-80 percent. The NBA had previously announced its approval by posting its decision document on the International Biosafety Clearing House website (https://bch.chd.int/en/). This is the first GE crop developed and approved by Ghana. See, USDA/FAS Accra, "GAIN-GHANA | GH2022-0012 | BT Cowpea Approved for Environmental and Market Release," located at: https://apps.fas.usda.gov/newgainapi/api/Report/DownloadReportByFileName?fileName=BT%20Cowpea%20Approved%20for%20Environmental%20and%20Market%20Release_Accra_Ghana_GH2022-0012.pdf.

[5] *Callosobruchus maculatus* (*Coleoptera: Bruchidae*) is a species of beetles known commonly as the cowpea weevil or cowpea seed beetle.

cotton, and the GE cotton have been halted due to lack of funding. Likewise, the lack of funding is precluding the confined field trials for the NEWEST rice. Ghana currently does not use GE plants to produce antibiotics, nor pharmaceuticals for human or animal diseases.

b) Commercial Production

In Ghana there is no commercial production of biotech crops. Commercial production of the recently released PBR cowpea, or Bt cowpea, is expected to commence in 2025.

c) Exports

Not at present. Ghana is not currently producing any GE crop.

d) Imports

Ghana requires prospective importers of GE products to seek approval from the National Biosafety Authority and the Food and Drugs Authority of Ghana (FDA-Ghana) before importation. The NBA is the first to give clearance, followed by the FDA-Ghana for products classified as food per the NBA's issued guidelines. A food safety assessment is required for bioengineered products that contain actively detectable GE traits or those that have not undergone a high degree of processing to denature the foreign deoxyribonucleic acid (DNA).

Based on the scope of the Biosafety Act, 2011 (Act No. 831) and the Biosafety (Management of Biotechnology) Regulations, 2019 (L.I. 2383), agricultural products, that may contain GE elements, such as microbial biotech products, soybean, soybean meal, soybean oil, and other processed foods, are permissible.[6] Such agricultural products can be freely imported from Argentina, Brazil, China, the European Union, South Africa, and the United States. Since 2020, significant imports of these products, averaging around 21 million metric tons (MMT) per annum have been recorded.

e) Food Aid

Ghana is a recipient of U.S. Government (USG) food aid; specifically, receiving food security assistance through the U.S. Department of Agriculture's (USDA) Food for Progress (FFPr) program.[7] Ghana has no biotechnology-related trade barriers impacting USG food security assistance.

[6] The Ghanaian Biosafety Act, 2011 (Act No. 831), provides rules relative to the transfer, handling and use of "genetically modified organisms" resulting from biotechnology for purposes of protection public health and the environment. It establishes the Ghanaian National Biosafety Authority (NBA) and defines its functions and powers. This Act also establishes an Appeals Tribunal and provides with respect to inspections. See, Food and Agriculture Organization of the United Nations – FAOLEX, "Ghana, Biosafety Act, 2011 (Act No. 831)," located at: https://www.fao.org/faolex/results/details/en/c/LEX-FAOC136733/#:~:text=This%20Act%20provides%20rules%20relative,defines%20its%20functions%20and%20powers. See, the Ghana Biosafety Authority, located at: https://nba.gov.gh/act-and-regulations/ for the "Biosafety Act, 2011 (Act No. 831)," at https://nba.gov.gh/wp-content/uploads/2020/09/Act-831.pdf and for the "Biosafety (Management of Biotechnology Regulations, 2019 (L.I. 2383)" at https://nba.gov.gh/wp-content/uploads/2020/09/L-I-2383.pdf.

[7] The USDA/Foreign Agricultural Service (FAS) administered Food for Progress program helps developing countries and emerging democracies modernize and strengthen their agricultural sectors. U.S. agricultural commodities donated to recipient countries are sold on the local market and the proceeds are used to support agricultural, economic, or infrastructure

f) Trade Barriers

Currently, Ghana has no biotechnology-related trade barriers.

PART B: POLICY

a) Regulatory Framework

In 2002, the Ghanaian government established the National Biosafety Committee, with a mandate to draft the Biosafety Bill, produce guidelines for the implementation of the Biosafety Law, and prompt the Ghanaian government's commitment to move forward on biotechnology issues. The NBC was originally composed of officials from government institutions, scientists, farmer organizations, and other stakeholders. In consultative dialogue with the government, the NBC drafted the 2004 Biosafety Bill, as well as produced the National Biosafety Framework and Biosafety Guidelines. The National Biosafety Authority has since managed the implementation of the Ghana's **Biosafety Act 2011 (Act No. 831).** A thirteen-member Board of Directors is in place; whose term ends after three years.

TABLE 1: Ghana: Legal Terms and Definitions

Legal Term	Laws and Regulations	Legal Definition
Genetically Modified Organism (GMO)	- Biosafety Act, 2011 (Act No. 831). - Biosafety (Management of Biotechnology) Regulations, 2019 (L.I. 2383.	Includes an organism that has been transformed by the insertion of one or more genes, or regulatory elements, or an organism that has had its own genes modified without the insertion of any new genes and their products. In the Ghanaian context, GMOs and Living Modified Organisms (LMOs) may be used interchangeably.

In 2016, a Memorandum of Understanding (MOU) was prepared and signed between the NBA and the seven regulatory agencies. This MOU replaced the separate bilateral agreements that had been signed between the NBA and each of the regulatory agencies, namely, the Food and Drugs Authority of Ghana, the Ghana Standard Authority (GSA), the Environmental Protection Agency of Ghana (EPA-Ghana), the Customs Service of the Ghana Revenue Authority (GRA), the Plant Protection and Regulatory Services Directorate (PPRSD), the Veterinary Services Directorate (VSD), and local government. This initiative engenders cooperation among the regulatory agencies.

Ghanaian Government Ministries, Role in GE Plant Regulation: The Ministry of Environment, Science, Technology, and Innovation (MESTI) is the national focal point on biosafety. The MESTI is responsible for liaising with the Secretariat of the Convention on Biological Diversity for the administrative functions required under the Cartagena Protocol on Biosafety (CPB). The Ghanaian Biosafety Regulatory System is a coordinated framework. The MESTI receives support from the

development programs. Food for Progress has two principal objectives: to improve agricultural productivity and to expand trade of agricultural products.

Ministry of Food and Agriculture's (MOFA) PPRSD (i.e., on plant heath and related matters) and the VSD (i.e., on animal health and related matters), and counts with the Ministry of Finance (MOF) support through the GRA's Customs Division (at ports and frontier posts handling GE products in collaboration with the other agencies). Included under the MESTI are the FDA-Ghana and the EPA-Ghana, two institutions with oversight responsibilities for food safety and environmental impact related matters.

The National Biosafety Authority is one of three institutions that is responsible for implementing the **Biosafety Act, 2011 (Act No. 831).** The Technical Advisory Committee (TAC) and the Institutional Biosafety Committees (IBCs) are also key institutions tasked with implementing the requirements of this Act.

The NBA is the designated national authority on all issues related to modern agricultural biotechnology in Ghana. All applications, except for contained use and field trials, go through this authority. The governing body of the NBA is a Board whose chairman and members are appointed by the President of the Republic for three-year assignments. The TAC consists of a total of eleven individuals from the regulatory agencies and the private sector, knowledgeable in science and socio-economic matters related to biotechnology. The TAC serves as a national advisory committee for issues related to biotechnology and undertakes risk assessments of applications at the request of the Board. The MESTI appoints the TAC members based on the Board's recommendations for a period not exceeding three years. The seven regulatory agencies of the Ghanaian government responsible for monitoring and enforcement are also represented on the TAC. The Institutional Biosafety Committees are responsible for reviewing applications for contained use and field trials.

The National Biosafety Authority, Its Role and Membership: The **Biosafety Act, 2011 (Act No. 831)** established the NBA, an interdisciplinary agency, to process applications relating to biotechnology products specified under the Act. The NBA ensures adherence to the Cartagena Protocol on Biosafety by implementing the national biosafety guidelines and other regulations. Additionally, the Act provided the NBA's governing board with an advisory committee to provide technical advice. The establishment of the IBCs was also provided under the Act. The **Biosafety Act, 2011 (Act No. 831)** also allows for the development of further guidelines to facilitate the better performance of the NBA. The NBA has the powers, as stated under section 39 of the Act to:

- Draft and adopt regulations or guidelines to ensure the safety of humans and the environment.
- Stop a project, through the relevant Institutional Biosafety Committee, after establishing that the project is unsafe to humans or the environment.
- Approve the deregulation of all regulated materials for the free movement and commercial release on the recommendation of the relevant IBCs.

The **Biosafety Act, 2011 (Act No. 831)** states that a person or organization intending to introduce a GE product into the environment, import, or place it on the market must first obtain a written approval of the NBA. The structure of the NBA's governing body is as follows:

- An expert in biotechnology and related biological sciences including biosafety, as the Chairperson.
- The Chairperson of the Technical Advisory Committee established under section 27.
- One representative from the Ministry of Environment, Science, Technology, and Innovation; and not below the rank of Director.
- One representative from the Association of Ghanaian Industries (AGI).
- One legal practitioner, with not less than ten years of experience, counting with sufficient background knowledge relevant to the subject matter of the Act.
- One representative from a non-governmental organization (NGO), preferably a farmer-based organization (FBO).
- Two members from academia that have sufficient background knowledge relevant to the subject matter of the Act; and at least one of whom is a woman.
- One representative from the Council for Scientific and Industrial Research; and not below the rank of Director.
- One representative from the Ministry of Food and Agriculture; and not below the rank of Director.
- One representative of the Ministry of Health; and not below the rank of Director.
- One representative from the Customs Division of the Ghana Revenue Authority.
- The Chief Executive Officer of the National Biosafety Authority.

Political Factors: The Biotechnology and Nuclear Agriculture Research Institute (BNARI) of the Ghana Atomic Energy Commission (GAEC) coordinated the draft Biosafety Framework for Ghana between November 2002 and July 2004. The United Nations Environment Programme/Global Environment Facility (UNEP/GEF) provided financial and technical support for the project. The framework is unique to Ghana and is modeled on the UNEP/GEF blueprint, that includes: a government policy on biosafety; a regulatory regime; a system to handle requests for authorizations (including risk assessment, decision-making) and administrative functions; systems for follow-up (such as enforcement and monitoring for environmental effects); and strategies for public awareness and participation.

Before the **Biosafety Act, 2011 (Act No. 83**1) was passed, the Ghanaian government's position on biotechnology was guided by other principles stated in the National Science and Technology Policy (2000), the Constitution (Articles 36, 41), and the Ghana Poverty Reduction Strategy (GPRS).

The Ghanaian government ratified the Cartagena Protocol on Biosafety in May 2003. The Ghana **Biosafety Act 2011 (Act No. 831)** was passed, paving the way forward for the development and use of GE products. The "precautionary approach and the environmentally sound management of biotechnology" are also factors that were included in drafting the Framework and Biosafety Act. For example, the Act begins by stating that the first objective is "to ensure, under the precautionary principle, an adequate level of protection in the field of safe transfer, handling, and use of genetically modified organisms ("GMOs") that may harm the environment."

In April 2017, President Nana Addo Dankwa Akufo-Addo launched the "Planting for Food and Jobs" program. The President explained that planting for Food and Jobs will be anchored on the provision of improved seeds, supply of fertilizers, the provision of dedicated extension services, a marketing strategy, and the use of e-agriculture. This initiative seeks to drastically increase domestically produced food. While biotechnology is not explicitly mentioned, it is gradually being recognized as an innovative tool in furthering the success with this initiative.

Regulatory Distinction, GE Plant Products with and without DNA in Final Form: Regulatory distinction exists between GE plant products containing DNA in the final form of the product and those products of GE plants that do not contain DNA in the final form. All GE plant products that contain DNA with an active gene in the final form of the products are deemed as "GMO." These are first regulated by the NBA before being regulated by the FDA-Ghana. All GE plant products that do not contain DNA in the final form of the product (e.g., oil, sugar) are not regulated by the NBA.

Regulatory Distinction, Living and Non-living GE Plant Products: Pre-market approval by the NBA is only required for "Living Modified Organisms (LMOs)" such as seeds. Placement of non-living GE products or processed foods (such as meal, cake) on the market only requires approval from the FDA-Ghana. Non-living GE products are considered non- "GMOs." In the case of living GE products, an application for approval to import is reviewed by the NBA and the relevant regulatory agencies within 180-days. If there is need for the review to go beyond 180-days, the NBA communicates this to the applicant accordingly.

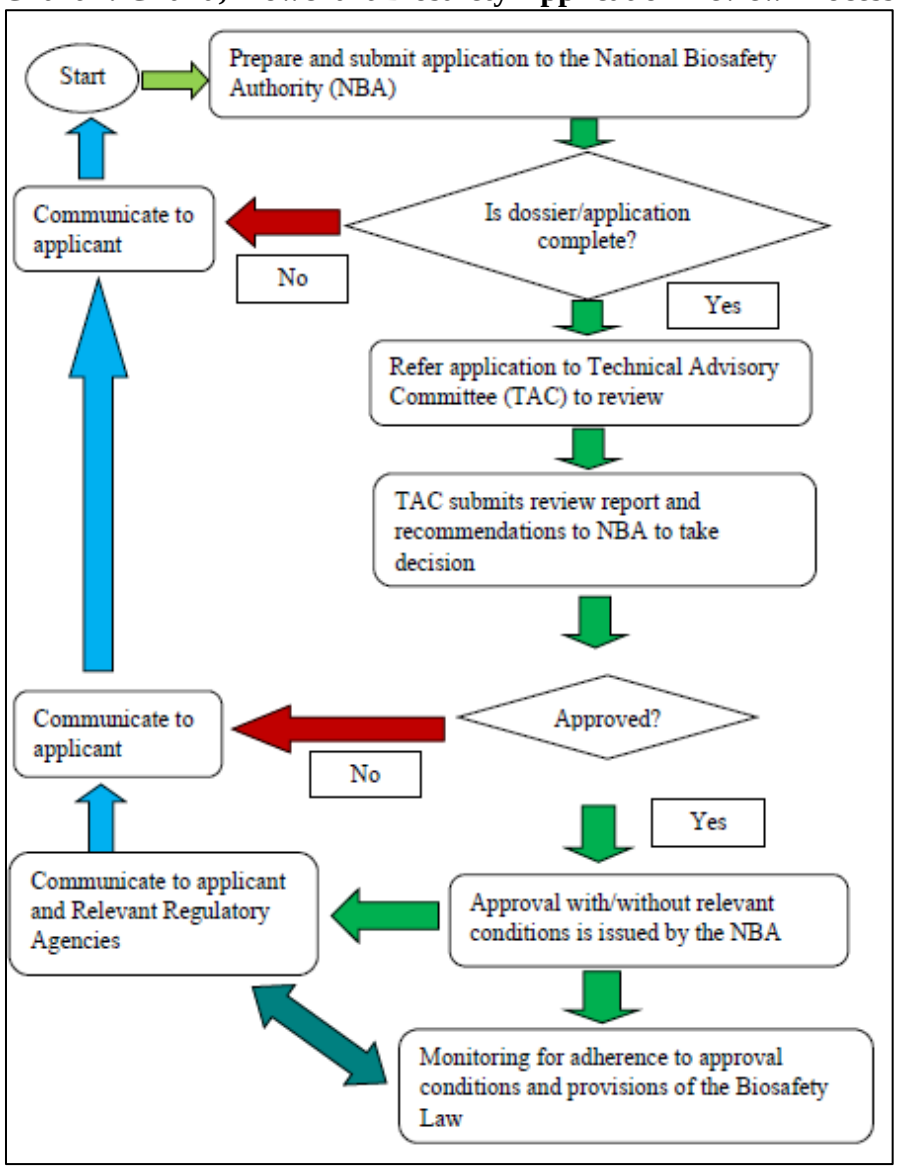
Regulatory Approval/Authorizations for Various GE Plant Products: The approval process under the **Biosafety Act, 2011 (Act No. 831)** is similar for food, feed, fiber, pulp, processing, and environmental release. Approval for environmental release pertaining to cultivation requires environmental impact risk assessment. The NBA through the TAC does the assessment in collaboration with the relevant regulatory agencies. The period of review and the regulatory agencies involved will depend on the type of request, as well as the bioengineered product specified in the request.

The NBA's issued guidelines stipulate that for applications requesting introduction into the environment, and import or placement on the market, a risk assessment shall be conducted in accordance with Schedule Four (4) of the **Biosafety Act, 2011 (Act No. 831)**, and in accordance with the Cartagena Protocol on Biosafety (Annex III). Food safety assessment for applications to place prepackaged bioengineered products on the market shall be conducted in accordance with the Act and current Codex *Alimentarius* (Codex) guidelines for safety assessment of food derived from recombinant DNA organisms.

Pending Legislations and Regulations: FAS Accra is not aware of any pending legislation and regulations with the potential to affect U.S.-origin exports bound for Ghana.

Timeline for Approvals: The timeline for the approval of applications can take up to 261-days.

Chart 1: Ghana, Flowchart Biosafety Application Review Process



Source: Ministry of Environment, Science, Technology, and Innovation (MESTI).

Biosafety Legislation, Regulations: In June 2019, Ghana passed regulations on the management of biotechnology (biosafety). The **Biosafety (Management of Biotechnology) Regulations, 2019 (L.I. 2383)**, spell out how provisions in the **Biosafety Act, 2011 (Act No. 831)** will be implemented. It also provides guidelines to some institutions, such as the IBCs, as well as the process for moving a product from research to commercial release. Previously guideline L.I. 1887 only covered research.

Additional Registration Requirements for Approved GE Plant Products: Additional registration is required beyond GE plant approval/authorization depending on the specific product (for example, seed or food). If seed, additional approval is required from the MoFA's National Variety Release and Registration Committee. If food, additional approval is required from the FDA-Ghana.

Requirement of Re-registration: Re-registration is not a requirement. Registration is done just once.

b) Approvals/Authorizations

Approvals or authorizations last for a period of three years and are renewable. Subsequent renewals are only administrative, and do not require fees or new risk assessments.

The NBA approved the pod borer resistant (PBR), or Bt cowpea event 709A, developed by the CSIR-SARI for commercial release. Seventeen other biotechnology events (i.e., eight soybean events and nine corn events) submitted by BASF, Bayer CropScience, and the Monsanto Company have also received the NBA's approval for import for feed, food use, and industrial processing.[8] Fourteen out of the 17 events received approval in February 2024. This approval, however, does not cover planting the events within Ghana.

TABLE 2: Ghana, Product/Event Approved

Product/Event	Developer	OECD Unique Identifier	Usage
709A cowpea	CSIR-SARI, Ghana	AAT-709AA-4	Feed, food, processing, and cultivation
A2074-12 soybean	BASF	ACS-GM005-3	Feed, food, and processing
A5547-127 soybean	Bayer CropScience	ACS-GM006-4	Feed, food, and processing
GTS 40-3-2	Monsanto Company	MON-04032-6	Feed, food, and processing
MON87701	Monsanto Company	MON-87701-2	Feed, food, and processing
MON87705	Monsanto Company	MON-87705-6	Feed, food, and processing
MON87708	Monsanto Company	MON-87708-9	Feed, food, and processing
MON87751	Monsanto Company	MON-87757-7	Feed, food, and processing
MON89788	Monsanto Company	MON-89788-1	Feed, food, and processing
T25 maize	Bayer CropScience	ACS-ZM003-2	Feed, food, and processing
MON810	Monsanto Company	MON-00810-6	Feed, food, and processing
MON87411	Monsanto Company	MON-87411-9	Feed, food, and processing
MON87427	Monsanto Company	MON-87427-7	Feed, food, and processing
MON87460	Monsanto Company	MON-87460-4	Feed, food, and processing
MON88017	Monsanto Company	MON-88017-3	Feed, food, and processing
MON89034	Monsanto Company	MON-89034-3	Feed, food, and processing
NK603	Monsanto Company	MON-00603-6	Feed, food, and processing
GA21	Monsanto Company	MON-00021-9	Feed, food, and processing

Source: FAS Accra office research.

c) Stacked or Pyramided Event Approvals

The National Biosafety Authority's Board of Directors has approved the NBA's guidelines on stacked trait events. The NBA requires additional approval for stacked events if one or more of the traits involved has/have not already received approval. If all the traits involved have each received prior approval from the NBA, the researcher needs to just notify the authority in writing about the

[8] The Monsanto Company (including fully and partly owned companies).

research. There is, however, a need to review a prior approval if there is a sequencing change regarding an approved GE trait.

d) Field Testing

Ghana allows field testing, and confined field trials (CFTs) are managed strictly in conformity with issued guidelines by the IBCs and NBA as dictated by the **Biosafety (Management of Biotechnology) Regulations, 2019 (L.I. 2383)**. On September 15, 2023, the NBA approved the CSIR-SARI CFT (ongoing) covering bruchid- (weevil) resistant cowpea. Duration for CFT approvals is three years but renewable.

e) Innovative Biotechnologies

The National Biosafety Authority's Board of Directors has approved the NBA guidelines on genome editing, that was earlier validated by stakeholders.[9] Ghana now joins the league of African countries including Kenya, Malawi, and Nigeria, with guidelines for genome editing. The objective of the guidelines is to provide procedural guidance to potential applicants on the categories of genome edited organisms and/or their products that shall be regulated under the **Biosafety Act, 2011 (Act No. 831).** The scope of the guidelines details the procedures for determining which genome edited organisms or products may be regulated under the **Biosafety Act, 2011 (Act No. 831**). Without the guidelines on genome editing, the NBA would have had to regulate everything genome edited as genetically engineered. In July 2024, the NBA approved the BNARI's request to commence genome editing of rice, targeting disease resistance (against the yellow mottle virus) and drought tolerance.

f) Coexistence

The **Biosafety Act, 2011 (Act No. 831)** is silent on co-existence. However, cultivation co-existence with non-GE crops (including organic agriculture) is implied.

g) Labeling and Traceability

Though the biosafety legislation does not contain any labeling requirements for biotech or GE food products, or strict liability provisions, labeling is required for packaged foods and feeds in Ghana. The FDA-Ghana's **General Labelling Rules, 1992, (L. I. 1514)** stipulate that food labeling be informative and accurate.[10] Labeling of packaged and prepackaged products is for purposes of health, food safety, and need to know. The minimum labeling requirements are that labeling should be clear, concise, and in the English language. Also, labels should capture product name, net mass/weight, batch number, expiry date, and country of origin (if imported). A list of ingredients and food additives must be stated. It is mandatory to label any prepackaged food item. General labeling regulations for food products are strictly enforced, but they are not specific to biotechnology products.

[9] For Ghana's guidelines on genome editing see, https://bch.cbd.int/en/database/LAW/BCH-LAW-GH-265861-1.
[10] See, Food and Agriculture Organization of the United Nations – FAOLEX, "Ghana Standards Board (Food, Drugs and other Goods) General Labelling Rules, 1992 (L.I. No. 1541)," located at: https://www.fao.org/faolex/results/details/en/c/LEX-FAOC017279/ and https://faolex.fao.org/docs/pdf/gha17279.pdf.

The FDA-Ghana Governing Board has approved developed guidelines to regulate the labeling of food and/or food ingredients obtained from genetic engineering, and food containing genetically modified "GM" ingredients. These guidelines apply to all bioengineered food and/or food ingredients and food containing GE ingredients that are: a) locally manufactured or produced; b) imported; c) exported; and d) are intended for sale. Labeling is not required for highly processed foods except where the food has been genetically modified with respect to composition, nutritional value, allergenicity, or its intended use. Also, labeling is not required for foods or ingredients with low level presence of no more than five percent.

The approved guidelines discourage negative labeling or claims; and stipulate that negative labeling of foods and ingredients, such as "non-GMO" or other similar labels shall not be made for foods or ingredients, which do not have "GM" counterparts. Indeed, such action by any person or corporate entity, according to the guidelines, constitutes an offence and shall be liable to a fine.

h) Monitoring and Testing

The **Biosafety Act, 2011 (Act No. 831)** established a monitoring body for biotechnology products. A monitoring program of GE food products has been developed. Equipment has been acquired to establish a GE detection lab on the premises of the GSA, however, installation is yet to be completed. This is to help ensure that the importation of GE products, especially living GE products, follows the NBA's guidelines. The testing will also ensure that only approved GE events are in circulation. There is no timeline on implementing this monitoring and testing site, but announcements providing further details are anticipated soon.

i) Low Level Presence (LLP) Policy

Per the FDA-Ghana's 2023 approved guidelines, the maximum threshold for low level or adventitious presence is up to five percent of the product or shipment.

j) Additional Regulatory Requirements

Additional regulatory requirements are needed for commercial release for planting and food by the National Variety Release and Registration Committee (NVRRC) and the FDA-Ghana, respectively. In the case of seeds, the PPRSD/Ghana Seed Inspection Division collaborates with the NVRRC, which makes recommendations to the National Seed Council regarding the official release or otherwise. These additional regulatory requirements call for additional field trials, but the NBA, the PPRSD, and the NVRRC are considering combining the CFT and the data gathering stage of the varietal release process. Nonetheless, these additional regulatory requirements have nothing to do with the genetic makeup of the product. They are just mandatory requirements for all products, bioengineered or not.

k) Intellectual Property Rights (IPR)

Ghana is a member of the World Intellectual Property Organization (WIPO), the Universal Copyright Convention (UCC), and the African Regional Industrial Property Organization (ARIPO). Manufacturers and traders are strongly advised to patent their inventions and register their

trademarks in Ghana and to do so through a patent or trademark agent. Registration fees vary according to the nature of the patent, but local and foreign applications attract the same rate. The Ghanaian system for patent and trademark protection is based on British law, and it was only in 1992 that the patent laws of the United Kingdom ceased to apply in Ghana. Local courts offer compensation when infringements occur, though few cases have been filed in recent years.

The Copyright Act was passed in 1961 and the Trademark Act in 1965 (amended in 2004). The Copyright Administration in Ghana is responsible for patents, copyright, and trademarks. Registration of a trademark permits the holder to have the exclusive right to use the registered mark for a specific product or group of products. Upon patent approval, the applicant is given the exclusive right to make, export, import, sell, use a product, or apply a patented process. The Copyright Act of 1965 (amended in 1970 and 2005) makes it a criminal offense to counterfeit, reproduce, export, import, exhibit, perform, or sell any work without the copyright owner's permission. The **Biosafety Act, 2011 (Act N. 831)** does not contain any IPR requirements for biotechnology products. The Plant Variety Protection Act, 2020 (Act 1050) was passed in December 2020, to help address intellectual property rights related to plant breeding in general.[11]

l) Cartagena Protocol Ratification

Ghana ratified the Convention on Biological Diversity in August 1994 and the Convention's Cartagena Protocol on Biosafety on May 30, 2003. As stated in the National Biosafety Framework for Ghana, the Protocol is in line with the country's constitutional obligations, environmental laws and policies, and the fulfillment of treaty obligations. A law on biosafety has been passed, and regulations have been developed and issued but trade has not been affected in any way. Ghana gets regularly represented at the CPB bi-annual Conference of the Parties serving as the Meeting of the Parties. Ghana's National Biosafety Authority represents Africa on the bureau of the Conference of the Parties and participates in meetings of the Subsidiary Body on Scientific, Technical, and Technological Advice.

m) International Treaties and Forums

Ghana has taken a pro-biotechnology position at the CPB, the WTO, and Codex, and acknowledges biotechnology and nanotechnology as a means of achieving much-needed development under the science, technology, and innovation policy.

n) Related Issues

President Nana Addo Dankwa Akufo-Addo appointed the former Provost of the College of Health Sciences, University of Ghana Medical School, Professor Yao Tettey, as the Chairperson of the NBA Governing Board. The appointment follows the 2023 decease of Professor Charles Antwi Boasiako, the two times Board Chairperson.

[11] See, World Intellectual Property Organization, WIPOLEX, Ghana, "Plant Variety Protection Act, 2020 (Act 1050)," located at: https://wipolex-res.wipo.int/edocs/lexdocs/laws/en/gh/gh039en.pdf.

PART C: MARKETING

a) Public/Private Opinions

A few groups that lobby against the use of agricultural biotechnology maintain an active presence. Lawsuits against the commercial release of GE products in Ghana were filed, but these were dismissed in 2024.[12] Stakeholders are engaging the media on biotechnology issues to convey accurate, science-based information. In Ghana, this is leading to greater interest in having an honest discussion on biotechnology. As revealed by the public comments solicited by the NBA prior to the decision to approve the Bt cowpea for environmental release and subsequent commercialization, most of the respondents to the public notice supported the application.

b) Market Acceptance/Studies

In Ghana, many deliberations on biotechnology are done by academia, researchers, and Ghanaian government officials from the relevant ministries. All that notwithstanding, producers are eager to adopt GE crops as a means of achieving improved productivity. For instance, after observing the results of the Bt cotton trials, Ghanaian farmers were highly impressed that cotton could be produced with only two insecticide applications per production cycle; these went on to demand that the seeds be made available to them immediately. Similar interest has been expressed by cowpea farmers. FAS Accra is not aware of any specific study assessing Ghanaians' acceptance of biotechnology products. However, Post expects that the Ghanaian producer, importer/retailer, and the consumer would accept appropriately regulated biotechnology inputs and products if these guarantees increased yield and income, result in higher profit margins, and lead to quality affordable products.

[12] See, https://www.graphic.com.gh/news/general-news/court-dismisses-injunction-against-approval-of-14-gmo-products-in-ghana.html; https://www.myjoyonline.com/high-court-dismisses-suit-against-commercialisation-of-gmos/.

CHAPTER 2: ANIMAL BIOTECHNOLOGY

PART D: PRODUCTION AND TRADE

a) Product Development

Post is not aware of the development of any bioengineered animal product in Ghana.

b) Commercial Production

There is no commercial production of GE animals, insects, birds, or fish in Ghana, nor is there commercial production of cloned animals. The country's focus remains on plant biotechnology.

c) Exports

Ghana does not produce, nor export any GE animals, animal clones, or products from these animals.

d) Imports

Would not be any different from that for plant biotechnology.

e) Trade Barriers

Not applicable. The focus remains on plant biotechnology.

PART E: POLICY

a) Regulatory Framework

The regulatory framework for animal biotechnology is the same as that for plant biotechnology.

b) Approvals

Not applicable. The focus remains on plant biotechnology.

c) Innovative Biotechnologies

Not applicable. The focus remains on plant biotechnology.

d) Labeling and Traceability

Not applicable. The focus remains on plant biotechnology.

e) Additional Regulatory Requirements

Not applicable. The focus remains on plant biotechnology.

f) Intellectual Property Rights

Not applicable. The focus remains on plant biotechnology.

g) International Treaties and Fora

Ghana is a member of the World Organization for Animal Health (WOAH).

h) Related Issues

Not applicable. The focus remains on plant biotechnology.

PART F: MARKETING

a) Public/Private Opinions

Not applicable. The focus remains on plant biotechnology.

b) Market Acceptance/Studies

Not applicable. The focus remains on plant biotechnology.

CHAPTER 3: MICROBIAL BIOTECHNOLOGY

PART G: PRODUCTION AND TRADE

a) Commercial Production

Nothing to report.

b) Exports

Ghana exports alcoholic beverages, dairy products, and processed products, which may contain microbial biotech-derived food ingredients.

c) Imports

The only microbial biotech-derived food ingredients imported by Ghana are those usually utilized in the production of alcoholic beverages, dairy products, and processed products. Likewise, Ghana imports alcoholic beverages, dairy products, and processed products, which may contain microbial biotech-derived food ingredients.

d) Trade Barriers

Not applicable. The focus remains on plant biotechnology.

PART H: POLICY

a) Regulatory Framework

The regulatory framework is the same as that for plant biotechnology.

b) Approvals

Same as for plant biotechnology.

c) Labeling and Traceability

Same as for plant biotechnology.

d) Monitoring and Testing

Same as for plant biotechnology.

e) Additional Regulatory Requirements

Same as for plant biotechnology.

f) Intellectual Property Rights

Same as for plant biotechnology.

g) Related Issues

Not applicable. The focus remains on plant biotechnology.

PART F: MARKETING

a) Publications/Private Opinions

Not applicable. The focus remains on plant biotechnology.

b) Market Acceptance/Studies

Nothing to report.

Attachments:

No Attachments