**Required Report:** Required - Public Distribution **Date:** December 22, 2025

**Report Number:** SF2025-0036

# **Report Name:** Biotechnology and Other New Production Technologies Annual

**Country:** South Africa - Republic of

**Post:** Pretoria

**Report Category:** Biotechnology and Other New Production Technologies

**Prepared By:** Dirk Esterhuizen

**Approved By:** Oliver Flake

**Report Highlights:**

Asynchronous approvals pose significant trade risks, as South Africa enforces zero tolerance for the unintentional presence of genetically engineered (GE) events in food and feed imports. In 2024, a severe drought sharply reduced South Africa's corn and soybean production, necessitating imports to meet demand. FAS/Pretoria worked closely with industry stakeholders to address asynchronous GE crop approvals between the United States and South Africa. This collaboration facilitated $105 million in U.S. corn and soybeans exports to South Africa—the highest in the 30 years. South Africa's regulatory stance on products developed through genome editing remains unchanged and highly stringent, posing significant challenges to the advancement of innovative biotechnologies in the country. Private sector stakeholders in South Africa continue to push for a risk-proportionate regulatory approach to support the development and adoption of innovative biotechnologies.

**Executive Summary:**

Total bilateral agricultural trade between the United States and South Africa grew by 5 percent in 2024, reaching $869 million, up from $825 million in 2023. U.S. biotechnology-related exports to South Africa included $105 million in corn and soybeans and $44 million in processed products potentially containing biotech-derived food ingredients (see GAIN reports Market Opens for United States Soybeans, South Africa Market Opens United States Corn, and Southern Africa Shortages Boost United States Corn and Soybean Exports Benefiting American Farmers).
In 2024, the United States imported $112 million worth of processed products from South Africa that may contain biotech-derived food ingredients.

South Africa has been a involved in agricultural biotechnology research and development for over 30 years, driving significant gains in farm productivity. Several domestic and international regulations govern the use of GE products in South Africa. Since 1997, South Africa has approved 34 GE plant events for general release and commercial cultivation, with GE events widely cultivated in corn, soybeans, and cotton. Today, more than 80 percent of corn plantings, approximately 95 percent of soybean plantings, and virtually all cotton plantings in South Africa use GE seeds. South Africa is also a major exporter of corn and soybeans, except during extreme droughts that limit production (see GAIN reports Grain and Feed and Oilseeds and Products).

In 2023, South Africa confirmed that products developed using modern genome editing would be regulated under the same risk assessment framework as traditional GE products, in accordance with its "GMO" Act, regardless of whether foreign DNA is present (Minister's final decision on NBTs). This strict regulatory approach, among the most stringent globally, creates significant barriers to advancing agricultural biotechnology, including innovations like CRISPR. Private sector stakeholders in South Africa continue to advocate for a more balanced, risk-proportionate regulatory system to unlock the potential of new technologies.

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# PLANT AND ANIMAL BIOTECHNOLOGY

## CHAPTER 1: PLANT BIOTECHNOLOGY

### PART A: PRODUCTION AND TRADE

### (a) RESEARCH AND PRODUCT DEVELOPMENT

South Africa has been engaged in biotechnology research and development for over 30 years and remains the biotechnology leader on the African continent. To date, South Africa has approved 34 GE plant events for commercial production (see Table A1 in the appendix). These 34 approved GE plant events fall within three main commodities—corn, soybeans, and cotton—and include traits such as herbicide tolerance, insect resistance, pollination control systems, and drought tolerance.

Over the past five years, South Africa has issued nearly 40 field trial permits for GE crops. Table A2 of the appendix highlights the events, traits, products, and companies involved in advancing agricultural innovation since 2020. To the best of FAS/Pretoria's knowledge, no GE plants are currently being used to produce antibiotics or pharmaceuticals for human or animal diseases.

In addition to large multinational companies such as Bayer, Corteva, Syngenta, and BASF, several South African parastatals, universities, and agricultural industry organizations are actively involved in innovative GE research. These organizations include:

#### The Agricultural Research Council's Biotechnology Platform

The Agricultural Research Council's Biotechnology Platform (ARC-BTP) was launched in 2010 as a key strategic initiative of the ARC. ARC-BTP's mission is to develop high-throughput resources and technologies essential for applications in genomics, quantitative genetics, marker-assisted breeding, and bioinformatics within the agricultural sector. The platform aims to position itself as both a research-focused and service-oriented institution, fostering an environment for hosting and training highly skilled researchers.

The technologies developed by ARC-BTP are available as services to the ARC, collaborators, private companies, science councils, and researchers across the African continent. For more information, please visit the following link: ARC-BTP.

#### The Forestry and Agricultural Biotechnology Institute at the University of Pretoria

The Forestry and Agricultural Biotechnology Institute (FABI) is located at the University of Pretoria in South Africa. FABI advances the field of plant biotechnology through an interdisciplinary approach, maintaining strong connections with a variety of academic departments. The institute has been active since 1998. For more information, please visit the following link: FABI-UP.

**The Institute for Wine Biotechnology at Stellenbosch University**

The Institute for Wine Biotechnology (IWBT) was established at Stellenbosch University in 1995 (see also IWBT). The Institute is an internationally recognized postgraduate training and research institute that provides advanced training and innovative research to support South Africa's wine and grapevine industries. Wine and related products represent a significant portion of South Africa's agricultural exports to the United States, with an annual export value typically exceeding $38 million.

**The South African Sugarcane Research Institute**

The South African Sugarcane Research Institute (SASRI) is a globally recognized agricultural research institute dedicated to supporting the sustainability of South Africa's sugar industry. SASRI's research is organized into four multidisciplinary programs: Variety Improvement, Crop Protection, Crop Performance and Management, and Systems Design and Optimization.

The Variety Improvement Program focuses on developing and releasing high-yielding, adaptable, pest- and disease-resistant sugarcane varieties that enhance industry productivity and add value. Advanced biotechnological methods are used to commercially develop GE sugarcane with traits such as insect borer resistance, herbicide tolerance, and improved drought stress tolerance. For more information, please visit the following link: SASRI.

## (b) COMMERCIAL PRODUCTION

South Africa commercially cultivates three GE agricultural crops: corn, soybeans, and cotton. In marketing year (MY) 2024/25, a total of 3.8 million hectares (MHa) of these crops were planted in South Africa, with an estimated 3.4 MHa or almost 90 percent planted using GE seeds. Of the total GE area, GE corn accounted for about two-thirds, or 2.3 MHa, followed by GE soybeans at approximately 32 percent, or 1.1 MHa, and GE cotton at roughly one percent, or 16,000 hectares (ha). This widespread adoption of biotechnology places South Africa among the top 10 global producers of GE crops worldwide.

### Corn

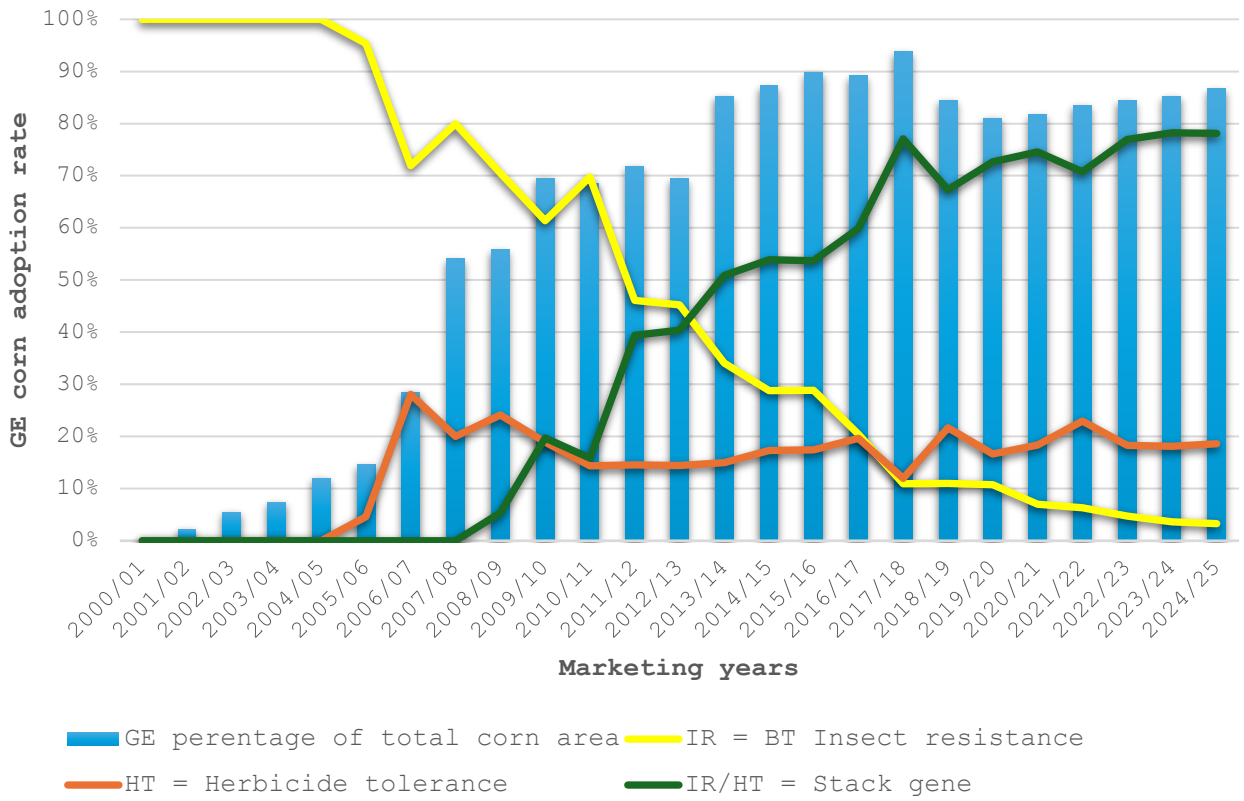
Corn is South Africa's most important field crop, serving dual purposes: human consumption (primarily white corn) and animal feed (primarily yellow corn). Over the past five years, South Africa has produced an annual average of over 15 million metric tons (MMT) of corn, making it a critical component of the country's agricultural economy.

South Africa's adoption of GE corn began in 1999 with the introduction of insect-resistant varieties, on just 0.1 percent of the country's total corn area. Since then, GE corn cultivation has expanded significantly, now accounting for over 85 percent of total corn area (see Figure 1). In MY 2024/25, of the 2.6 MHa of corn planted, an estimated 2.3 MHa were planted with GE seeds.

The majority of GE corn production in South Africa – approximately 78 percent – consists of stacked varieties that combine insect resistance and herbicide tolerance, offering farmers greater flexibility and resilience in managing pests and weeds. Single-trait varieties, including insect-resistant (3

percent) and herbicide-tolerant (19 percent) types, make up the remaining 22 percent of GE corn plantings.

***Figure 1:*** *The Adoption Trends of GE Corn in South Africa*

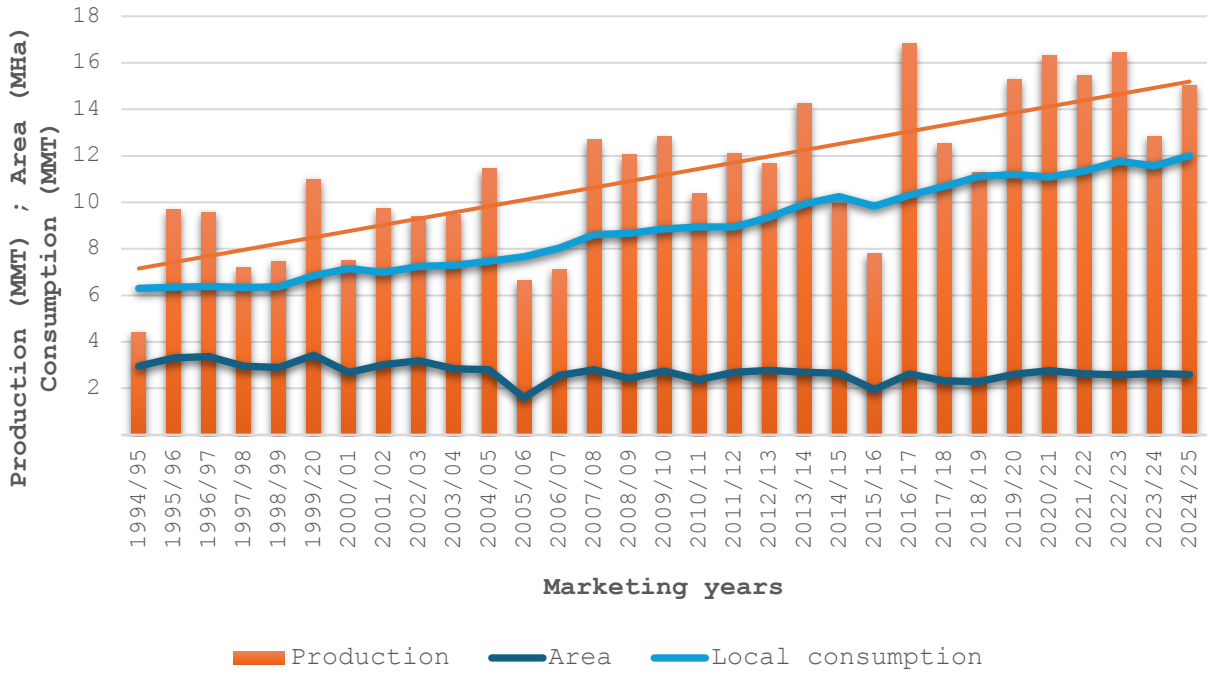



**Source:** FAS/Pretoria estimates and data from the Bureau for Food and Agricultural Policy

South Africa is largely self-sufficient in corn production, with imports typically limited to years when drought significantly impacts output (see Figure 2). Over the long term, South Africa has demonstrated a consistent trend of increasing corn yields while maintaining a stable planting area. Over the past 30 years, South Africa's corn yields have more than doubled (see Figure 3), a success attributed to the adoption of advanced production technologies, including GE seeds, and the implementation of improved farming practices such as precision agriculture and conservation farming.

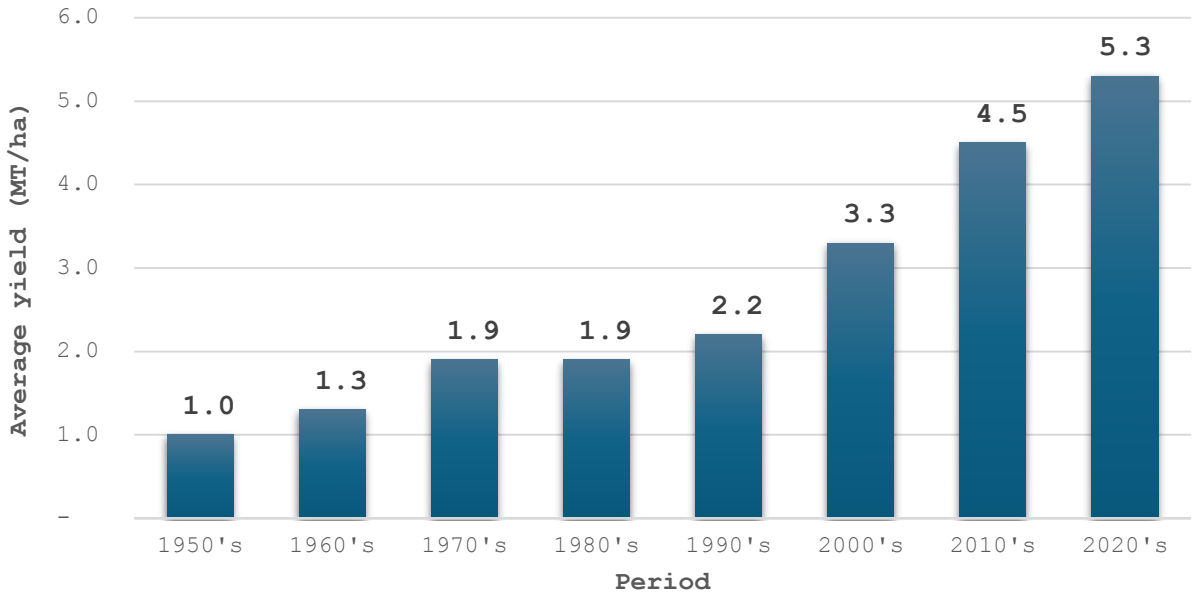
This steady progress underscores South Africa's ability to leverage innovation to enhance agricultural productivity and sustainability. With current indications suggesting that the trend of achieving higher yields on stable planting area will continue in the future.

***Figure 2:*** *Area Planted, Production and Consumption of Corn in South Africa over the Past 30 Years*




**Source:** United States Department of Agriculture **(**USDA)

***Figure 3:*** *Trends in the Average Corn Yields in South Africa*



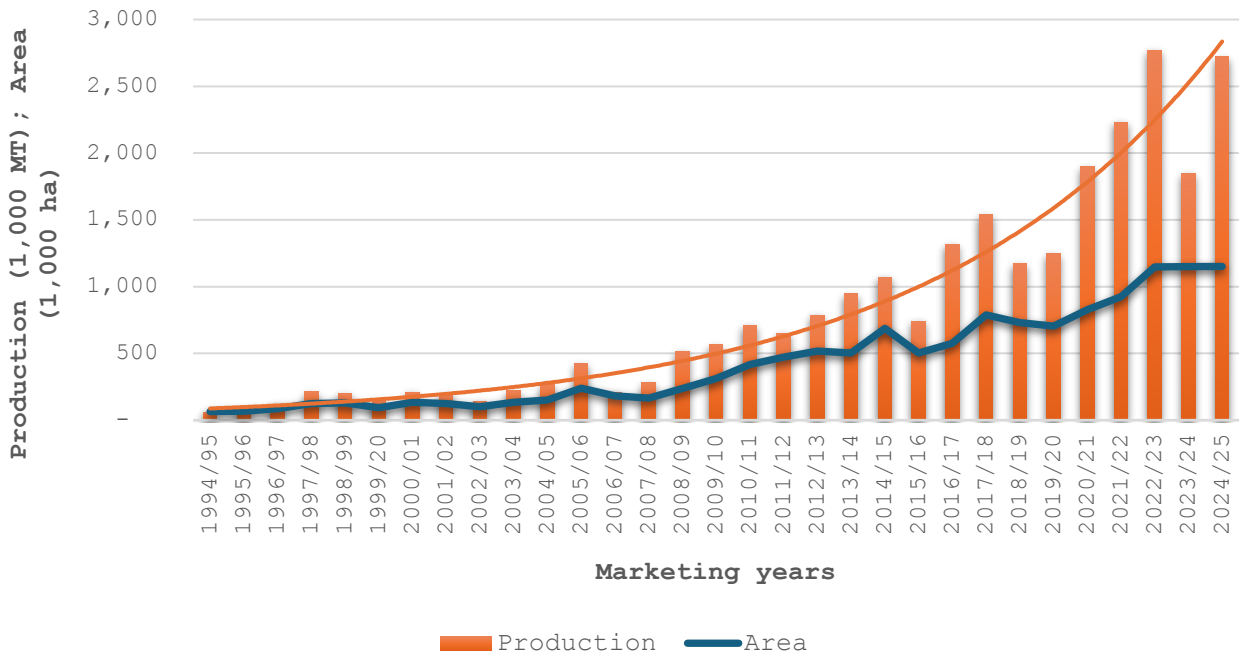

**Source:** FAS/Pretoria using data from the South African Grain Information Services

***Soybeans***

Over the past 30 years, South Africa has experienced an 18-fold expansion in soybean acreage (see Figure 4). In MY 2024/25, farmers planted a record 1.2 MHa of soybeans, a significant increase from just 65,000 ha planted three decades ago. This remarkable growth has been driven by several key factors:

- **Crop Rotation Benefits:** Farmers increasingly use soybeans as a rotational crop with corn to improve soil health and manage pests and diseases, and lower nitrogen applications in corn.
- **Rising Domestic Demand:** Significant investments in oilseed processing facilities have spurred local demand for soybeans, creating a reliable market for producers.
- **Adoption of GE Soybeans:** The introduction of GE soybeans in 2001 revolutionized production. By 2006, 75 percent of the soybean crop was GE, and today, more than 95 percent of soybeans in South Africa are planted with GE seeds. Initially, GE soybean plantings consisted exclusively of glyphosate-tolerant varieties, but recently, stacked traits that include insect resistance—particularly for African Bollworm—have become available, further enhancing productivity.

***Figure 4:*** *Area Planted and Production of Soybeans in South Africa over the Past 30 Years*

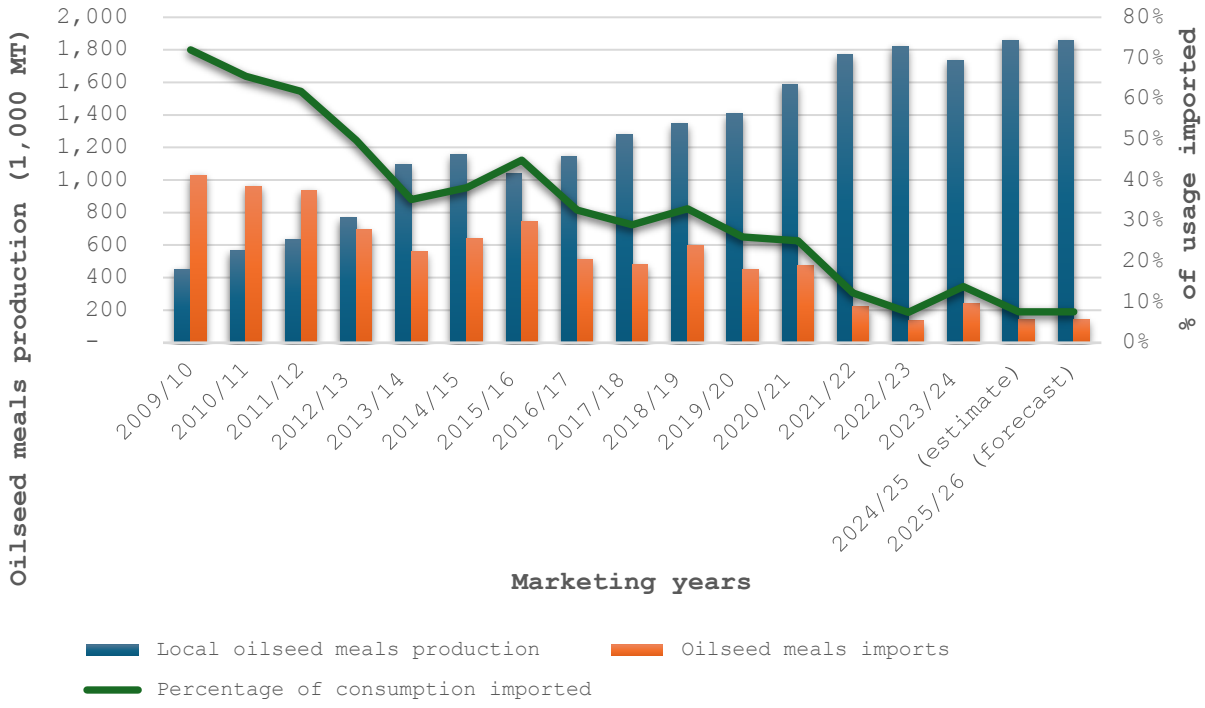



**Source:** United States Department of Agriculture **(**USDA)

Soybeans play a critical role in South Africa's animal feed industry, as oilseed meals are a primary source of protein for feed production. Soybean meal is the most widely used protein source, accounting for more than 70 percent of protein meal usage in animal feed. On average, protein meals constitute between 20 and 30 percent of feed rations. Most soybeans grown in South Africa are crushed domestically to produce protein meal for use in animal feed formulations, reducing reliance on imports.

Figure 5 highlights the trend of replacing imported oilseed meal with locally produced oilseed meal, driven by significant investments in crushing capacity. Currently, less than 10 percent of the oilseed meals consumed domestically are imported. However, high transportation costs—primarily by road—from South Africa's summer rainfall production regions in the north to the coastal areas in the south suggest that some soybean meal imports will likely continue to supply the needs of the coastal regions.

***Figure 5:*** *Trends in the Replacement of Oilseed Meal Imports with Locally Produced Meal in South Africa*




**Sources:** FAS/Pretoria estimates and data Trade Data Monitor LLC

## Cotton

In 1997, South Africa approved its first GE cotton variety with insect resistance, marking the beginning of biotechnology adoption in the country's cotton sector. Over time, the use of GE cotton has evolved, and today, most cotton planted in South Africa consists of stacked gene varieties that combine insect resistance and herbicide tolerance. These traits provide farmers with improved pest control and weed management, reducing input costs and increasing efficiency.

Despite the availability of advanced GE cotton technologies, cotton production in South Africa remains relatively small. Farmers often prioritize more profitable crops, such as corn and soybeans, which offer higher returns on investment. In MY 2024/25, the total area planted to cotton remained steady at less than 20,000 ha, reflecting the crops limited role in South Africa's overall agricultural landscape.

While cotton's footprint in South Africa is modest, its production is still significant for certain regions and farming communities, particularly in areas where cotton is well-suited to local growing conditions. The adoption of stacked GE cotton varieties has helped maintain competitiveness in these areas by improving yields and reducing the need for chemical inputs.

**(c) EXPORTS**

Exporters of GE products in South Africa are required to apply for a GE export permit under the "GMO" Act of 1997. Applications must include a permit or letter of authority from the importing country's Competent Authority, confirming authorization to import GE products.

**Corn**

South Africa's corn exports for MY 2024/25 are projected to reach 1.5 MMT, supported by a commercial crop exceeding 16.0 MMT. Improved harvests in neighboring countries, particularly Zimbabwe (see GAIN report Zimbabwe Grain and Feed Annual) and Zambia (see GAIN report Zambia resumes corn exports amid record breaking production), are expected to reduce regional demand for South Africa's corn exports, especially white corn. However, South Africa has resumed yellow corn exports to profitable Asian markets, including Vietnam, Taiwan and South Korea. Exports to Asia taper off in October/November as the Northern Hemisphere harvest begins. In MY2022/23, South Africa exported over 1.7 MMT of corn to Asia, underscoring the region's importance as a reliable market.

In MY 2023/24, South Africa exported 2.3 MMT of corn, primarily to neighboring countries, with Zimbabwe accounting for the largest share due to drought-induced demand. Of the total exports, South Africa shipped 1.5 MMT of white corn, and 781,000 MT of yellow corn (see Table 1).

***Table 1:*** *South Africa's Exports of Corn in MY 2023/24 and MY 2022/25*

| **MY 2023/24** *Full year* **(May 1, 2024 – Apr 30, 2025)** | | | | **MY 2024/25** *19 weeks* **(May 1, 2025, to Sept 5, 2025)** | | | |
|---|---|---|---|---|---|---|---|
| **Countries** | **White corn** | **Yellow corn** | **Total** | **Countries** | **White corn** | **Yellow corn** | **Total** |
| | **(1,000 MT)** | | | | **(1,000 MT)** | | |
| **Export Destinations** | | | | **Export Destinations** | | | |
| Zimbabwe | 841 | 443 | 1,284 | Vietnam | 0 | 109 | 109 |
| Botswana | 195 | 105 | 300 | Botswana | 64 | 24 | 88 |
| Namibia | 207 | 59 | 266 | Venezuela | 66 | 0 | 66 |
| Mozambique | 103 | 72 | 175 | Zimbabwe | 33 | 30 | 63 |
| Eswatini | 60 | 91 | 151 | Mozambique | 21 | 35 | 56 |
| Lesotho | 86 | 6 | 92 | Taiwan | 0 | 50 | 50 |
| Saudi Arabia | 0 | 4 | 4 | Eswatini | 11 | 39 | 50 |
| Zambia | 0 | 1 | 1 | South Korea | 0 | 48 | 48 |
| | | | | Lesotho | 31 | 1 | 32 |
| | | | | Namibia | 10 | 21 | 31 |
| **Total Exports** | **1,492** | **781** | **2,273** | **Total Exports** | **236** | **357** | **593** |

**Source:** FAS/Pretoria using data from the South African Grain Information Service (SAGIS)

**Soybeans**

Historically, South Africa's trade in oilseeds was limited, as the bulk of production was destined for local crushing. As a result, exports and imports primarily consisted of soybean oil and meal. However, with the surge in the local production of soybeans and crushing capacity reaching optimal levels, South Africa's soybean exports reached a historical high level of 597,000 MT in MY 2022/23.

In MY 2023/24, soybean exports dropped by 75 percent to 150,000 MT after a drought-reduced crop. In MY 2024/25, FAS/Pretoria expects oilseeds exports to reach 390,000 MT after soybean production surge by almost 50 percent. So far in MY 2024/25 (March 2025 to July 2025), South Africa has exported 55,000 MT of soybeans, mainly to Zimbabwe and Eswatini (see Table 2).

***Table 2:*** *South Africa's Soybean Exports*

| | MY 2023/24<br>*Full year*<br>(Mar 1, 2024 – Feb 28, 2025) | MY 2024/25<br>*5 months*<br>(Mar 1, 2025 – Feb 28, 2026) |
|---|---|---|
| **Export Destinations** | **(1,000 MT)** | |
| Zimbabwe | 106 | 40 |
| Eswatini | 14 | 15 |
| Vietnam | 28 | 0 |
| Botswana | 2 | 0 |
| Mozambique | 1 | 0 |
| **Total Exports** | **150** | **55** |

**Source:** FAS/Pretoria using data from the South Africa Grain Information Services

**Cotton**

South Africa's cotton exports remain modest, totaling 11,000 MT in 2024. Key markets include Bangladesh, Lesotho, Indonesia and Vietnam.

**(d) IMPORTS**

South Africa permits the importation of GE crops and GE processed products that have been approved by South African regulators for food and feed purposes, a process referred to as "commodity clearance." Table A3 in the appendix lists the 117 GE events that have received commodity clearance in South Africa since 2001 (also see Commodity Clearance Approvals).

Commodity clearance indicates that South Africa allows the importation of these GE events for use as food and/or feed. Typically, this applies to seeds that are not intended for planting but are processed in a way that renders them non-viable for propagation, such as through crushing or milling. While a complete food safety assessment is required for approval, an environmental assessment is not necessary due to the limited environmental exposure associated with these products.

Currently, commodity clearance approvals in South Africa cover six crops: corn, soybeans, rapeseed (commonly referred to as canola), cotton, rice, and wheat. In 2025, five new GE events received commodity clearance, while three events were approved in 2024.

**(e) FOOD AID**

South Africa does not receive food aid, even during drought years. However, international food aid shipments bound for neighboring countries such as Lesotho, Eswatini, Botswana, and Zimbabwe typically transit through South African ports.

For shipments containing GE commodities to pass through South Africa, the "GMO" Registrar's office requires specific measures to be followed. These include providing advance notification to ensure proper containment measures are implemented. Additionally, a letter from the recipient

country is required, confirming its acceptance of the food aid consignment and acknowledging that the shipment contains GE products.

These requirements reflect South Africa's regulatory approach to managing GE commodities while supporting regional food aid efforts.

## (f) TRADE BARRIERS

Asynchronous approvals of GE crops can significantly disrupt trade, particularly in South Africa, which enforces a zero-tolerance policy for the unintentional presence of unapproved GE events in food and feed imports. Since implementing its "GMO" Act in 1997, South Africa has become one of the top 10 global producers of GE crops, approving numerous GE events—such as corn and soybeans—for commercial cultivation. South Africa also permits the importation of GE crops, but the "GMO" Act requires that the list of GE events cultivated in an exporting country align with those approved by South African regulators for food and feed purposes.

According to South African regulatory procedures, "Import permits are issued for the import of GE consignments, irrespective of the crop and country, provided the exporting country has approved the same or fewer events than South Africa." In practice, this requires event-by-event synchronization. Synchronizing GE event lists between countries can be challenging, as commodities often include stacked events (combinations of two or more traits). South Africa mandates separate approval for stacked events, even if the individual traits have already been approved. Additionally, if an exporting country no longer cultivates a previously approved event, South Africa requires confirmation that cultivation has ceased.

Stakeholders in South Africa's grain and oilseeds industry closely monitor asynchronous GE approvals to prevent trade disruptions with key partners, including the United States. FAS/Pretoria has worked extensively with South African stakeholders to address these challenges and facilitate trade. In 2024, following an El Niño-induced mid-summer drought that reduced South Africa's corn and soybean production by 22 percent and 33 percent, respectively, FAS/Pretoria received a request from traders seeking to import U.S. soybeans and corn. The traders sought clarification on the synchronicity of GE events between the two countries.

On September 30, 2024, South Africa opened its market to U.S. GE soybeans (also see South Africa Market Opens for United States Soybeans). Subsequently, on November 19, 2024, South Africa's Department of Agriculture informed the industry that all GE corn events causing asynchrony with the United States had been approved, allowing import permits to be issued for U.S. GE corn (also see South Africa Market Opens United States Corn). These approvals were critical in addressing domestic consumption needs, as South Africa continued exporting corn to neighboring countries where demand remained high.

While South Africa is the leading producer of GE crops in Southern Africa, other countries in the region remain cautious or have outright bans on GE crops. However, during severe droughts or food shortages, when non-GE grains are unavailable, most countries in the region permit the importation of GE grain.

By the end of the 2024/25 season, the United States exported 225,000 metric tons (MT) of corn and 121,000 MT of soybeans to South Africa, with a combined trade value of $105 million (also see Southern Africa Shortages Boost United States Corn and Soybean Exports Benefiting American Farmers). These exports underscore the importance of resolving asynchronous GE approvals to maintain and expand agricultural trade between the two countries.

## PART B: POLICY

### (a) REGULATORY FRAMEWORK

South Africa's use of GE products is governed by a robust regulatory framework that incorporates both local and international standards. These regulations are designed to assess potential risks to human health and the environment before any activity involving GE products is undertaken.

#### Local Regulations

Domestically, GE agricultural plant products are regulated under the "GMO" Amendment Act of 1997 (Act 15 of 1997), administered by the Department of Agriculture (see also Genetically Modified Organisms Amendment Act). This regulation provides the foundation for GE product oversight, including research, development, production, and trade.

Additional regulations specific to GE products are outlined in legislation overseen by other South African government departments, including:

- **Department of Health:** Overseas food safety and labeling requirements to ensure consumer protection.
- **Department of Forestry, Fisheries, and Environment:** Handles post-release monitoring and environmental impact assessments triggers.
- **Department of Trade, Industry, and Competition:** Enforces labeling requirements to ensure transparency in the marketplace.

#### International Agreements

South Africa is signatory to two key international agreements that complement its domestic regulatory framework:

- **Cartagena Protocol on Biosafety:** Focuses on environmental considerations. Including safe transfer, handling, and use of living modified organisms.
- **CODEX Alimentarius:** Establishes food safety standards for GE products, ensuring alignment with global best practices.

Together, these local and international regulations form South Africa's National Biosafety Framework, which provides a comprehensive approach to managing GE products responsibly. This framework balances innovation with safety and sustainability, ensuring that GE products contribute to agricultural development while protecting human health and the environment.

For additional clarity, Table 3 outlines the components of South Africa's National Biosafety Framework, while Table 4 provides specific definitions related to the regulation of GE plants in South Africa.

***Table 3:*** *South Africa's National Biosafety Framework*

| | | **National** | **International** |
|---|---|---|---|
| **Health** | **"GMO" Act of 1997** *(Provides for measures to promote the responsible development, use and application of GE products)* | **Foodstuffs, Cosmetics & Disinfectants Act, 1972** *Defines labelling requirements for GE containing foods (Regulation 25, 2004).* | **CODEX Alimentarius** |
| **Environment** | | **National Environmental Management Act, 1998** *Provides general guidance regarding the criteria that may trigger an Environmental Impact Assessment for GE products.*<br><br>**National Environmental Management Biodiversity Act, 2004** *Regulates possible impacts of GE products on biodiversity and introduces minimum monitoring requirements, implemented through the South Africa National Biodiversity Institute (SANBI).* | **Cartagena Protocol on Biosafety** |
| **Socio-Economic** | | **Consumer Protection Act, 2008** *Introduced mandatory labeling requirements for all GE products (Regulation 293, 2008).* | |

**Source:** FAS/Pretoria adapted from Biosafety South Africa

***Table 4:*** *Specific Definitions Related to the Regulation of GE Plants in South Africa*

| Legal Term | Laws and Regulations where term is used | Legal definition |
|---|---|---|
| Accident | "GMO" Act | Means any -<br>(i) incident involving an unintentional environmental release of genetically modified organisms that is likely to have an immediate or delayed adverse impact on the environment or on human or animal health within the Republic; or<br>(ii) unintentional transboundary movement of genetically modified organisms that is likely to have an immediate or a delayed adverse impact on the environment or on human or animal health. |
| Biosafety | "GMO" Act | It means the level of safety when risk management measures must be taken to avoid potential risk to human and animal health and safety and to the conservation of the environment, because of exposure to activities with genetically modified organisms. |
| Commodity clearance | "GMO" Act | It means the authorization to use a genetically modified organism as a food and feed, or for processing, but excludes the planting of a genetically modified organism as a release into the environment. |
| General release | "GMO" Act | It means the release of a genetically modified organism into the environment by whatever means, where the organism is no longer contained by any system of barriers. |
| Environment | National Environmental Management Act | Means the surroundings within which humans exist and that are made up of—<br>(i) the land. water and atmosphere of the earth:<br>(ii) micro-organisms, plant, and animal life:<br>(iii) any part or combination of (i) and (ii) and the interrelationships among and between them: and<br>(iv) the physical. chemical, aesthetic, and cultural properties and conditions of the foregoing that influences human health and well-being. |
| Environmental impact assessment | "GMO" Act | It means the process used to assess the potential impact of an activity on the environment by collecting, organizing, analyzing, interpreting, and communicating information on such activity. |
| Genetically modified organism | "GMO" Act | Means an organism, the genes or genetic material of which has been modified in a way that does not occur naturally through mating or natural recombination or both. |

**The "GMO" Act of 1997**

In 1979, the South African government established the Committee on Genetic Engineering (SAGENE), a group of South African scientists tasked with serving as a scientific advisory body to the government. SAGENE played a pivotal role in advancing biotechnology in food, agriculture, and medicine in South Africa, laying the groundwork for the implementation of the "GMO" Act of 1997.

The "GMO" Act of 1997, along with its accompanying regulations, is administered by the Department of Agriculture. The Act was amended in 2005 to align with the Cartagena Biosafety Protocol and again in 2006 to address economic and environmental concerns. These amendments were approved in April, 2007, and came into effect in February 2010 after the regulations were published (see also GMO Regulations).

The preamble of the "GMO" Act remains unchanged, emphasizing the dual goals of ensuring biosafety while promoting the development of GE products. The Act governs the entire pipeline of GE product development, including research (contained use and field trial activities), production (general release activities), imports and exports, transport, and the use of GE products. All activities involving GE products are monitored through permits issued under the Act, including permits for imports, exports, commodity clearance, general release, field trials, and contained use.

The "GMO" Act established three main bodies to oversee its implementation:

- **Executive Council (EC):** Decision-making authority.
- **Advisory Council (AC):** Provides expert advice.
- **"GMO" Registrar:** Administers the Act and ensures compliance.

These bodies are tasked with:

- Promoting the responsible development, production, use, and application of GE products.
- Ensuring activities involving GE products minimize potential harm to the environment, human health, and animal health.
- Preventing accidents and managing waste effectively.
- Evaluating and mitigating risks associated with GE product activities.
- Establishing criteria for risk assessments.
- Creating procedures for notifying authorities of specific activities involving GE products.

The amendments to the Act underscore the importance of scientifically based risk assessments as a prerequisite for decision-making. They also authorize the EC to determine whether an environmental impact assessment is required under the National Environmental Management Act. Additionally, the amendments introduced provisions for socio-economic considerations, making them a significant factor in the decision-making process.

The "GMO" Act and its amendments provide South Africa with a robust regulatory framework for managing biotechnology. By enabling authorities to conduct scientific risk assessments and incorporate socio-economic factors into decision-making, the Act ensures that activities involving GE products are conducted responsibly, balancing innovation with safety and sustainability.

**The Executive Council**

The EC serves as both an advisory body to the Minister of Agriculture on matters related to GE products and, more critically, as the decision-making authority responsible for approving or rejecting GE product applications. The EC is composed of representatives from seven South African government departments:

- Department of Agriculture.
- Department of Forestry, Fisheries, and Environment.
- Department of Health.
- Department of Trade, Industry, and Competition.
- Department of Science, Technology, and Innovation.
- Department of Employment and Labor.
- Department of Water and Sanitation.

Before making decisions on GE applications, the EC is required to consult with the AC. The AC is represented in the EC through its chairperson, ensuring a direct line of communication between the two bodies.

The EC's decision-making process is based on unanimous agreement among its members. If consensus cannot be reached, the application is automatically considered declined. This high threshold for approval underscores the importance of ensuring that all EC representatives possess substantial expertise in biotechnology and biosafety to make informed decisions.

The EC's structure and rigorous decision-making process reflect South Africa's commitment to balancing innovation in biotechnology with the need for thorough oversight and risk management.

**The Advisory Council**

The AC is composed of 10 scientists appointed by the Minister of Agriculture, with input from the EC on member selection. The primary role of the AC is to provide expert advice to the EC on GE product applications.

To support its work, the AC is further assisted by subcommittee members who bring additional scientific expertise from various disciplines. Together, the AC and its subcommittees are responsible for evaluating the risk assessments of all GE applications, focusing on food, feed, and environmental impacts. Based on these evaluations, the AC submits recommendations to the EC to guide its decision-making process.

**The Registrar**

The Registrar, also appointed by the Minister of Agriculture, oversees the administration of the "GMO" Act. Acting under the instructions and conditions set by the EC, the Registrar plays a critical role in ensuring compliance with the Act. Key responsibilities of the Registrar include:

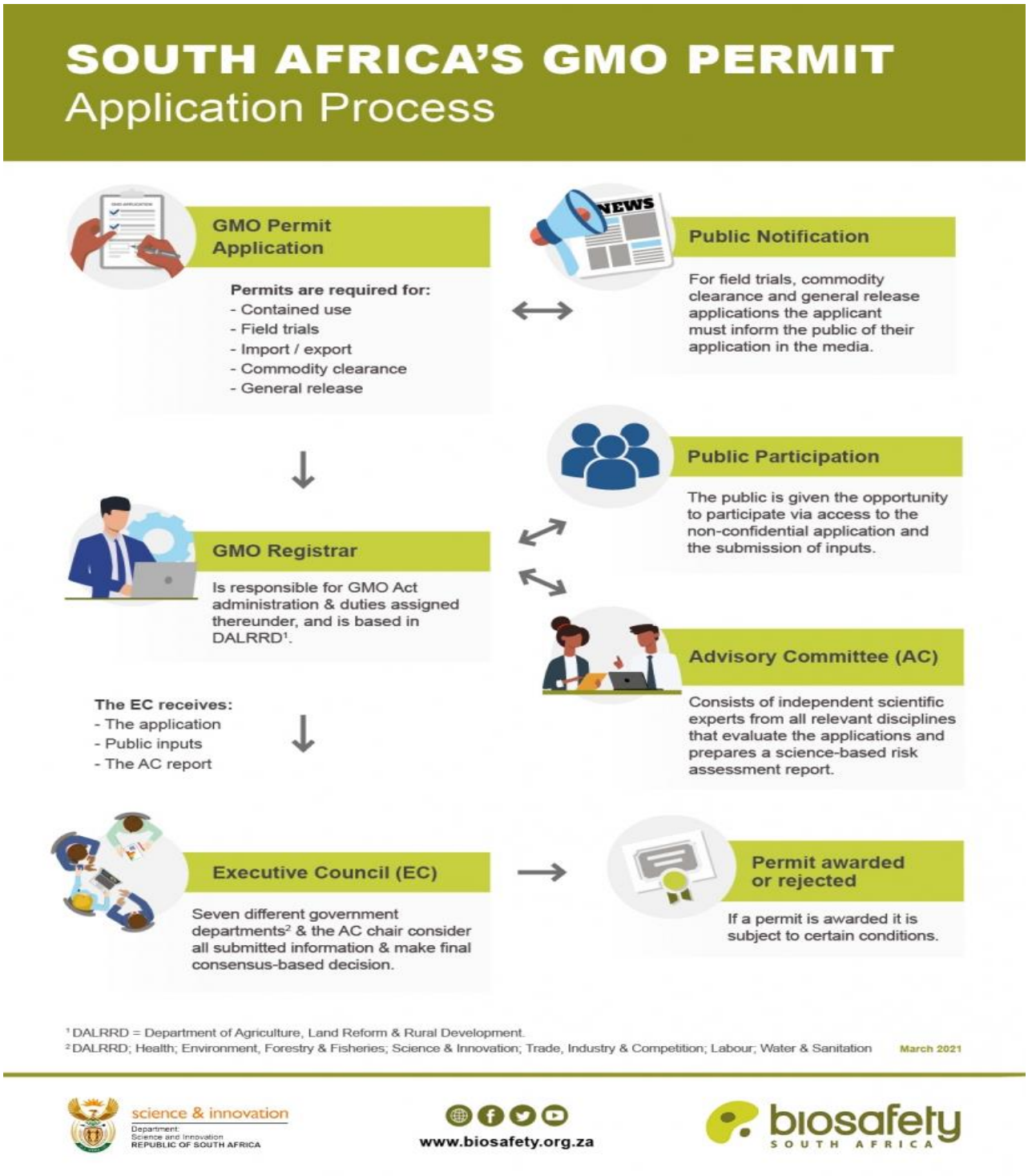
- Reviewing applications to ensure they conform to the Act.

- Issuing, amending, and withdrawing permits.
- Maintaining a register of GE activities.
- Monitoring facilities used for contained use and trial release sites.

The Registrar's work ensures that all activities involving GE products are conducted in accordance with South Africa's regulatory framework. For a detailed overview of the GE application process in South Africa, refer to Figure 6.

This structure highlights the collaborative and science-driven approach South Africa employs to regulate GE products, ensuring that decisions are informed, transparent, and aligned with national biosafety objectives.

***Figure 6:*** *The GE application process in South Africa*




**Source:** Biosafety South Africa

**Supporting Legislation**

**The National Environmental Management Act of 1998**

This Act, administered by the Department of Forestry, Fisheries, and the Environment (DFFE), establishes principles for environmental decision-making. It outlines criteria for Environmental Impact Assessments (EIAs) for GE products and procedures for addressing environmental risks. The Act and its amendments include:

- National Environmental Act (Act No. 107 of 1998)
- National Environmental Management Amendment Act (Act No. 8 of 2004)
- National Environmental Management Amendment Act (Act No. 62 of 2008)

**The National Environmental Management Biodiversity Act of 2004**

The National Environmental Management Biodiversity Act (Biodiversity Act) of 2004 was enacted with the stated purpose to protect South Africa's biodiversity from specific threats, including GE products. Section 78 of the Act grants the Minister of DFFE the authority to deny permits for general or trial releases under the "GMO" Act if the GE product poses a threat to indigenous species or the environment.

The Act also established the South African National Biodiversity Institute (SANBI), which is responsible for monitoring and reporting to the Minister of DFFE on the environmental impacts of any GE products released into the environment. SANBI's reports must address the effects on non-target organisms, ecological processes, indigenous biological resources, and the biodiversity of species used in agriculture.

**The Foodstuffs, Cosmetics, and Disinfectants Act of 1972**

The Foodstuffs, Cosmetics, and Disinfectants Act (Act No. 54 of 1972), administered by the Department of Health (DoH), regulates the sale, manufacture, and importation of foodstuffs, cosmetics, and disinfectants to ensure their safety and quality. The DoH follows the Codex Alimentarius principles and guidelines for food and feed safety requirements for GE products as its policy framework.

In 2004, the DoH issued mandatory GE food labeling regulations under this Act. Regulation 25 requires labeling for foodstuffs produced through genetic modification if they differ significantly from existing foodstuffs in terms of composition, nutritional value, storage, preparation, cooking, allergenicity, or if they contain genes of human or animal origin.

**The Consumer Protection Act of 2008**

The Consumer Protection Act (Act No. 68 of 2008), administered by the Department of Trade, Industry, and Competition, mandates labeling for all GE goods. Draft amendments to the GE labeling regulations were published in October 2012, but they raised significant concerns within South Africa's business community about the Act's limitations on GE labeling.

As a result, final GE labeling regulations under the Consumer Protection Act have not yet been published. This has prevented the enforcement of mandatory GE labeling requirements for stakeholders in South Africa's food supply chains.

**(b) APPROVALS**

Since 1997, South Africa has approved 34 genetically engineered (GE) plant events for general release under the "GMO" Act of 1997. (see also General Release Approvals). These approvals allow the events to be used for commercial planting, food and/or feed purposes, as well as for import and export. The events originate from four multinational companies - Bayer, Corteva, Syngenta, and BASF- and include three crops: corn, soybeans, and cotton. The most recent GE plant event approval in South Africa occurred in 2023. Table A1 of the appendix lists all GE events approved for general release, while Table 5 summarizes the traits and companies involved.

***Table 5:*** *The Traits and Companies Involved in South Africa's 34 Approved GE Plant Events for Cultivation*

| **Crop** | **Traits** | BAYER | syngenta | CORTEVA agriscience | BASF We create chemistry |
|---|---|---|---|---|---|
| Corn | Insect resistance (IR) | 2 | 2 | | |
| | Herbicide tolerance (HT) | 2 | 1 | 2 | |
| | Drought tolerance | 1 | | | |
| | Stacked (IR & HT) | 3 | 3 | 6 | |
| | Pollination control | | | 1 | |
| Soybeans | Herbicide tolerance | 1 | | 1 | |
| | Stacked (IR & HT) | 1 | | 1 | |
| Cotton | Insect resistance | 2 | | | |
| | Herbicide tolerance | 2 | | | 1 |
| | Stacked (IR & HT) | 2 | | | |

**Source:** FAS/Pretoria using data from the Department of Agriculture

As previously referenced, Table A3 in the appendix lists the 117 GE events that have received commodity clearance in South Africa since 2001 (see also Commodity Clearance Approvals). Commodity clearance means that South Africa allows the importation of these GE events for use as food and/or feed and that are not intended for environmental release.

**(c) STACKED OR PYRAMIDED EVENT APPROVALS**

South Africa mandates separate approval for GE planting seeds intended for general release when they combine two or more previously approved traits, such as herbicide tolerance and insect resistance. This requirement means that companies must effectively restart the approval process for stacked events, even if the individual traits have already been approved.

The EC has confirmed that, under the "GMO" Act, each stacked event must undergo a distinct safety assessment. To date, South Africa has approved 16 stacked events for general release, including 12 for corn and two each for soybeans and cotton. These stacked events combine insect resistance and herbicide tolerance traits.

**(d) FIELD TESTING**

Field testing of GE crops is permitted under the "GMO" Act of 1997. Table A2 in the appendix lists GE events approved for confined field trails. Facilities conducting GE activities must register with the Registrar of the "GMO" Act and submit a detailed application, including:

- Responsible personnel.
- Facility maps and geographic coordinates.
- Risk Assessments.
- Risk management strategies.

Registrations are valid for three years and must be renewed thereafter.

**(e) INNOVATIVE BIOTECHNOLOGIES**

Following the global introduction of innovative biotechnologies, South Africa began internal discussions to establish regulatory policies for New Breeding Techniques (NBTs), including genome editing and related products. On October 27, 2021, a public notice (see Notice*:* SA's Regulatory Approach for NBT's) was issued to stakeholders, outlining South Africa's regulatory approach. The notice stated that the existing risk assessment framework for GE products under the "GMO" Act of 1997 would also apply to NBTs.

The "GMO" Act defines a "GMO" as "an organism, the genes, or genetic material of which has been modified in a way that does not occur naturally through mating or natural recombination or both." Based on this definition, the EC determined that the current risk assessment framework for GE products would apply to all products developed using NBTs.

The public notice sparked significant dissatisfaction among international stakeholders, the local industry, and academia. In response, the local industry filed an internal appeal under the "GMO" Act, requesting that the Minister appoint an independent panel of experts to serve as the Appeal Board. The appeal argued that the consultation process was flawed, the definition of a GMO under the "GMO" Act was misinterpreted, and the decision was inconsistent with international best practices.

In December 2022, the Appeal Board ruled in favor of the industry on all grounds. It recommended that the EC's decision to regulate NBTs under the "GMO" Act be overturned and that a

consultative process be initiated within 12 months to develop a new regulatory framework for NBTs. The Board further recommended a science-based, case-by-case approach for regulating NBTs in South Africa.

However, on August 11, 2023, the then Minister of Agriculture, Ms. Thoko Didiza, announced via public notice (see Minister Final Decision on Agbiz Appeal) that the EC's original decision to regulate NBTs under the "GMO" Act would stand. The Minister stated that the "GMO" Act provides an appropriate framework to manage potential risks associated with NBTs.

This decision surprised the local industry, as it disregarded the Appeal Board's recommendations. South Africa has been a global leader in agricultural biotechnology research and development for over 30 years, driving significant growth in farm productivity. However, this strict regulatory stance—one of the most stringent globally—poses a risk to the advancement of agricultural biotechnology by imposing burdensome barriers on the use of innovative technologies like CRISPR.

Private sector stakeholders in South Africa continue to advocate for a risk-proportionate regulatory approach**.** They have formed a working group and remain hopeful that the decision could be reconsidered under the leadership of the current Minister of Agriculture, appointed in July 2024.

## (f) COEXISTENCE

Coexistence between GE and non-GE crops has not been a significant issue in South Africa, and no specific guidelines or regulations have been introduced to address it. Additionally, South Africa does not currently have a national organics standard. The government entrusts the management of approved GE field crops to farmers.

However, seed companies in South Africa strongly recommend that farmers implement an Insect Resistance Management (IRM) strategy when planting insect-resistant (Bt-technology) GE seeds. The IRM strategy aims to protect the Bt-technology and ensure its long-term effectiveness. According to seed companies, the most effective way to prevent insect resistance is by planting "refuge" areas—designated portions of farmland planted with non-GE seeds.

Farmers can choose between two options for planting a refuge:

1. Five percent of the total area planted with non-GE seeds that must not be treated with insecticides, or
2. Twenty percent of the total planted area with non-GE seeds that may be treated with insecticides.

To ensure compliance with IRM strategies, on-farm monitoring is conducted by either independent third parties or contractors employed by the seed companies. This approach helps maintain the effectiveness of Bt-technology while supporting sustainable farming practices.

## (g) LABELING AND TRACEABILITY

South Africa has had compulsory GE labeling regulations in place since 2004, introduced by the Department of Health (DoH) under the Foodstuffs, Cosmetics, and Disinfectants Act (1972) – Regulation 25. These regulations mandate labeling of GE foods only under specific circumstances, such as:

- When allergens or genes of human or animal origin are present,
- When a GE food product differs significantly from its non-GE equivalent in terms of composition, nutritional value, storage, preparation, or cooking, and
- When enhanced-characteristic claims (e.g., "more nutritious") are made for GE food products, requiring validation.

The regulations do not address claims that products are GE-free. To date, none of the GE products or foods on the South African market have triggered these requirements, as they are considered equivalent to their conventional counterparts.

In contrast, the Consumer Protection Act, administered by the Department of Trade and Industry and in force since April 2011, takes a broader approach to GE labeling. Section 24(6) of the Act requires labeling for all GE goods, stating:

- Products with more than 5 percent GE ingredients must display the declaration: "contains at least 5% genetically modified organisms" in a conspicuous and easily legible manner.
- Products with less than 5 percent GE ingredients may be labeled: "Genetically modified content is below 5%."
- Products where testing for GE traits is not feasible must be labeled: "may contain GMO ingredients."
- Products with less than 1 percent GE content may be labeled: "does not contain genetically modified organisms."

While Regulation 25 is based on health and food safety concerns, the Consumer Protection Act is value-based, focusing on consumers' right to information to make informed choices about food.

Draft amendments to the Act's GE labeling regulations were published in October 2012, proposing a shift in wording from "labeling genetically modified organisms" to "labeling genetically modified ingredients or components." This change would require individual ingredients to be labeled as containing "GMOs", rather than labeling the entire product.

The business community raised serious concerns about the practicality and limitations of the Act's GE labeling requirements. However, no further action has been taken by the Department to address these concerns or develop clearer guidelines. As a result, final GE labeling regulations under the Consumer Protection Act have not been published, leaving stakeholders in South Africa's food supply chains without enforceable GE labeling requirements.

## (h) MONITORING AND TESTING

In South Africa, GE commodities are imported through a permit system established under the "GMO" Act of 1997. This system applies to both living GE organisms and processed commodities. The "GMO" Act also allows for routine inspections by authorized inspectors. These inspections involve examining imported commodities and taking samples to test for the presence of unapproved GE events, ensuring compliance with regulatory requirements.

## (i) LOW LEVEL PRESENCE POLICY

South Africa enforces a zero percent Low Level Presence (LLP) tolerance for imports of GE products. This strict policy means that any detectable presence of unapproved GE events in imported consignments is prohibited.

For exports, however, South Africa applies a more lenient LLP threshold of less than 1 percent for seed and non-GE commodities. This allows for minimal traces of GE material in exported goods, provided they remain below the specified threshold.

Rather than conducting routine testing for unapproved GE events in imports, South Africa issues import permits for GE consignments regardless of the crop or exporting country. However, these permits are contingent on the condition that the exporting country is not cultivating GE events that are unapproved in South Africa. This approach ensures that only GE products aligned with South Africa's regulatory framework enter the country.

This zero-tolerance LLP policy for imports reflects South Africa's strict regulatory stance on GE products and underscores the country's desire to maintain control over the introduction of unapproved GE events into its agricultural and food systems.

## (j) ADDITIONAL REGULATORY REQUIREMENTS

In South Africa, no additional seed registration is required once a GE seed has been approved for general release under the "GMO" Act. This streamlines the process for commercial use of GE seeds after regulatory approval.

Seed certification in South Africa is voluntary, except for certain varieties specified under the Plant Improvement Act or when requested by the breeder or owner of the seed variety. This voluntary system allows breeders and seed companies to decide whether to pursue certification, which can serve as a quality assurance measure but is not mandated for all seed varieties.

## (k) INTELLECTUAL PROPERTY RIGHTS

Biotechnology companies operating in South Africa use a process for collecting technology fees that is similar to the system in the United States. This approach is effective because South Africa is a signatory to the Trade-Related Aspects of Intellectual Property Rights (TRIPS) agreement under the World Trade Organization (WTO). When buying these GE seeds like cotton and corn, farmers sign a one-year licensing agreement, and the technology fee is embedded in the price of the seed bag.

However, intellectual property rights enforcement for soybeans is more complex. Unlike cotton and corn, soybeans are self-pollinated, meaning farmers can save and reuse seed from their harvest rather than purchasing new seed each year. Additionally, many farmers use soybeans for on-farm feed, which may never enter commercial circulation, making it difficult for technology developers to collect fees at delivery points like grain terminals.

To address this challenge, the Minister of Agriculture approved a statutory levy on soybeans in 2018. This levy allows seed companies to be compensated for their contributions to the soybean seed market in South Africa. The levy is collected annually by the South African Cultivar and Technology Agency (SACTA), a non-profit organization established to ensure that breeding and technology levies are distributed to seed breeding companies and plant breeder rights holders. SACTA collects levies at the first point of sale or delivery, with buyers and processors or silo receipt issuers paying the levy and recovering it from producers. This system supports ongoing research and cultivar development, ensuring the sustainability of South Africa's agricultural innovation.

SACTA has successfully managed similar levies for wheat and barley for several years, demonstrating its role in maintaining funding for breeding programs and intellectual property protection in South Africa's agricultural sector. For more information, see Sactalevy.

## (l) CARTAGENA PROTOCOL RATIFICATION

South Africa ratified the Cartagena Protocol on Biosafety in 2003 and amended its "GMO" Act to align with the Protocol's provisions for risk assessment and transboundary movement of living modified organisms (LMO's).

The Cartagena Protocol emphasizes the importance of protecting biodiversity and human health while promoting the responsible use of biotechnology. South Africa's amendments to the "GMO" Act reflect its efforts to integrate international biosafety standards into its domestic regulatory framework.

## (m) INTERNATIONAL TREATIES and FORUMS

South Africa is a signatory member of the following relevant treaties:

- The Agreement on the Application of Sanitary and Phytosanitary Measures of the World Trade Organization (WTO-SPS).
- Codex Alimentarius Commission (Codex).
- International Plant Protection Convention (IPPC) of the Food and Agricultural Organization (FAO).
- The Convention on Biological Diversity.
- International Grains Agreement.

South Africa does not actively participate in discussions related to GE plants within these international organizations.

## (n) RELATED ISSUES

No additional issues related to plant biotechnology have been identified beyond those covered in this report.

## PART C: MARKETING

### (a) PUBLIC/PRIVATE OPINIONS

Public perceptions of biotechnology in South Africa have evolved significantly over the past two decades. A 2016 study by the Human Sciences Research Council (HSRC) revealed that more than half of South Africans believe biotechnology benefits the economy, with many expressing support for purchasing GE foods. Between 2004 and 2015, public awareness of biotechnology more than doubled, rising from 21 percent to 53 percent, while awareness that GE foods are part of their diet more than tripled, increasing from 13 percent to 48 percent (see Public Perceptions to Biotechnology).

A more recent study, published in 2025 by researchers from the University of South Africa (UNISA), explored consumer beliefs about GE foods and their impact on food security in South Africa (see Exploring Consumer Beliefs of Genetically Modified Foods). Although the sample size was small, the study found that certain benefits of GE foods are more important to consumers than others. The benefits that provide direct financial advantages to consumers were the key drivers of purchasing intent. Examples include lower prices and longer shelf life. In contrast, beliefs about production-related benefits or broader concerns did not significantly influence purchasing decisions. The study suggests that promoting the personal financial gains associated with GE foods can encourage their adoption. In developing countries where cost-conscious consumers stand to benefit directly from GE food purchases and consumption, this approach could play a critical role in addressing food security.

### (b) MARKET ACCEPTANCE/STUDIES

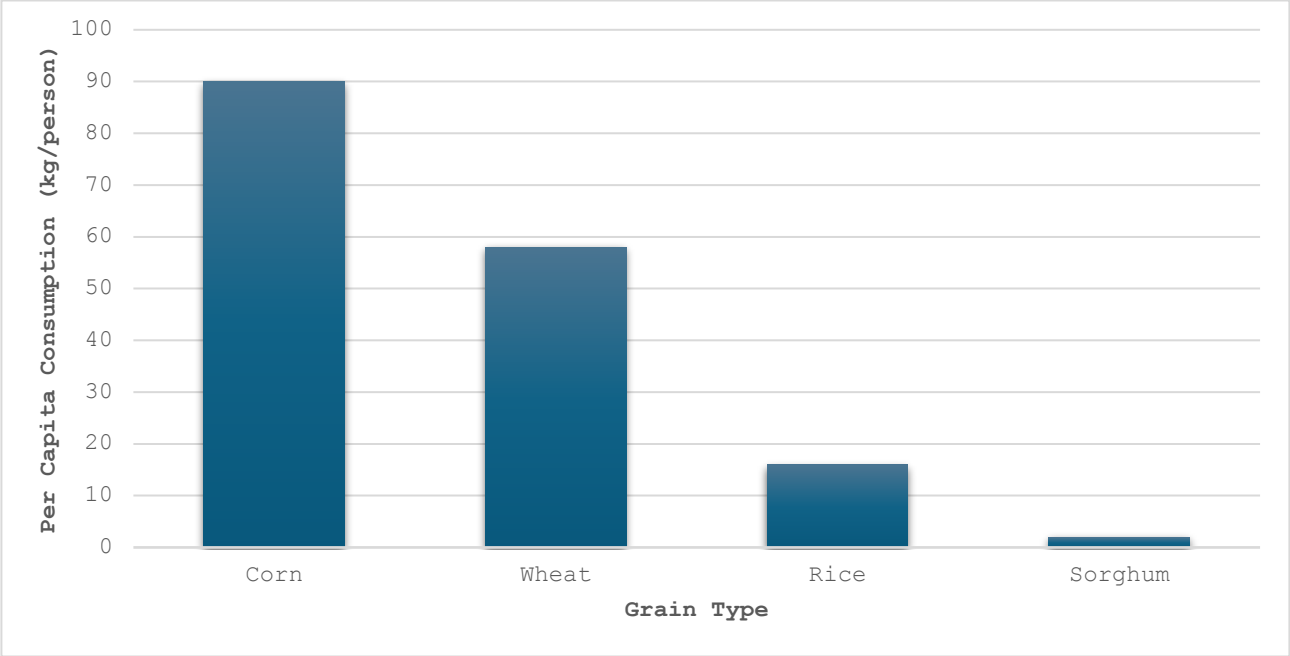
South African farmers, both commercial farmers and small-scale/emerging farmers, have widely adopted GE crops. Over 85 percent of corn, 95 percent of soybeans, and all cotton planted in South Africa are GE varieties. Farmers value GE crops for their reduced input requirements, such as lower pesticide and herbicide use, and their generally higher yields. Small-scale farmers find GE crops easier to manage for pest and weed control compared to traditional or conventional hybrid varieties.

South Africa's corn market is divided into two main categories: white corn and yellow corn. White corn, a staple food, is processed into maize meal (locally known as mielie or mealie meal) and serves as the primary carbohydrate source for human consumption. Annual per capita corn consumption of white corn is the highest among grains at 90 kilograms (kg) per person, followed by wheat (58 kg/person), and rice (16 kg/person) (see Figure 7).

Yellow corn, on the other hand, is primarily used in the animal feed sector, particularly for broiler

production. The broiler industry is South Africa's largest agricultural sector, accounting for 40 percent of total feed sales, which exceed 5 MMT annually. While white corn can also be used as animal feed when prices and availability are favorable, yellow corn is not culturally accepted for human consumption.

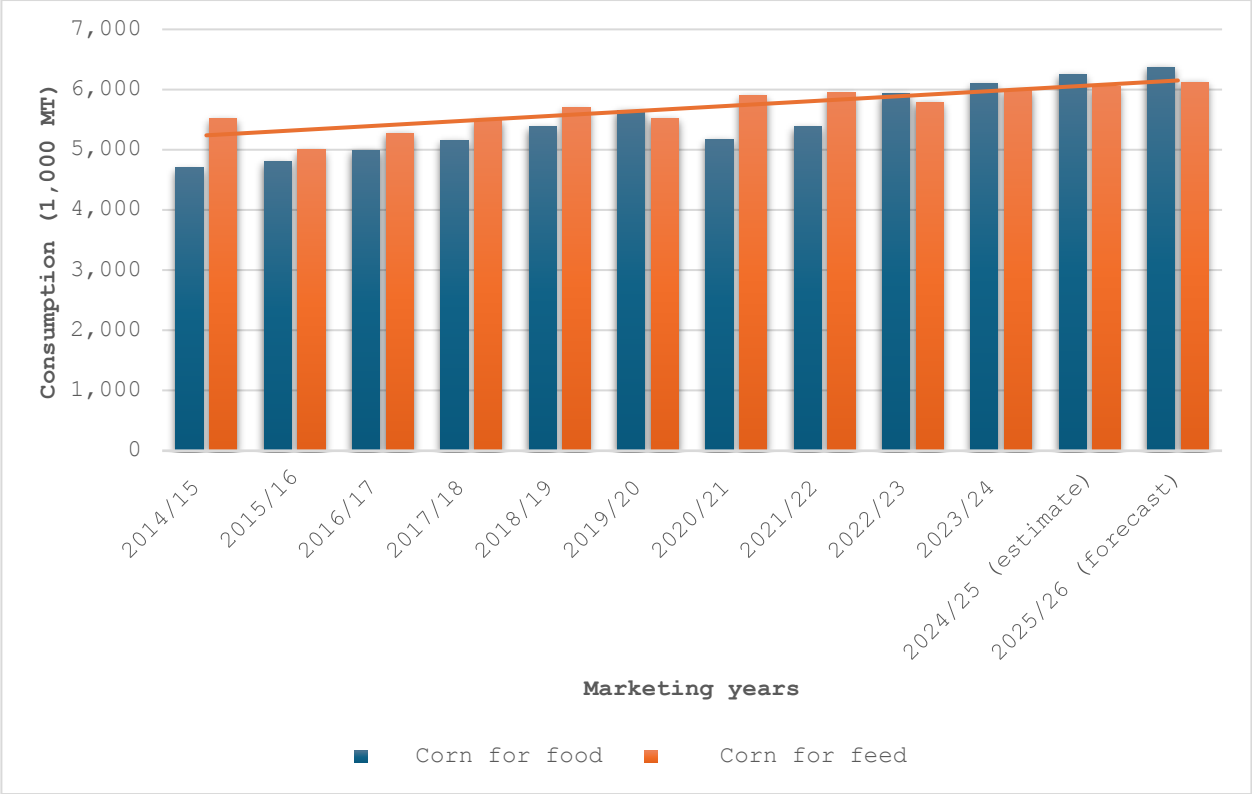
***Figure 7:*** *South Africa's Annual Per Capita Consumption of the Major Grains*




**Source:** Data from the Production, Supply and Distribution database of the United States Department of Agriculture

Corn consumption in South Africa has grown at an average annual rate of 2 percent over the past decade (see Figure 8). This growth is driven by population increases and immigration from neighboring southern African countries. Economic growth and rising disposable incomes have also contributed to higher consumption rates. However, in an environment of constrained consumer spending, demand for basic staples like white corn meal is expected to grow, while meat consumption – and consequently feed corn-may face pressure.

***Figure 8****: Corn Consumption in South Africa*

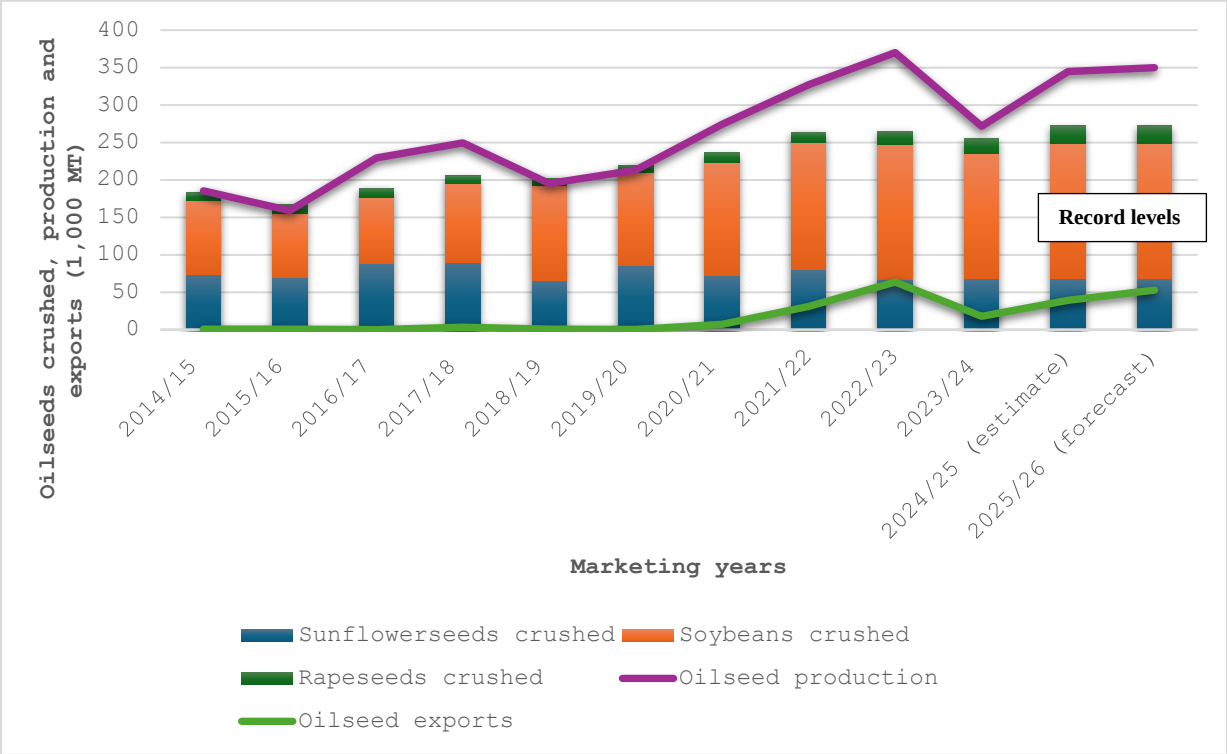



**Source:** FAS/Pretoria using data from the South Africa Grain Information Services

Soybeans are another key crop in South Africa's agricultural sector. FAS/Pretoria projects that South Africa will crush a record 2.7 MMT of oilseeds in MY 2025/26 and 2024/25, driven by higher soybean production (see Figure 9). Soybean meals are the most important protein source for feed manufacturers, accounting for over 70 percent of protein meal usage. Protein meal typically makes up 20–30 percent of feed rations.

Most soybeans produced in South Africa are crushed to produce protein meal for use in animal feed, with limited demand for soybeans as a food source. Soybeans are not traditionally consumed as part of the South African diet, and food use remains relatively small.

***Figure 9:*** *Trends in Oilseeds Crushed in South Africa*




**Source:** FAS/Pretoria estimates and data from the South Africa Grain Information Services

# CHAPTER 2: ANIMAL BIOTECHNOLOGY

## PART D: PRODUCTION AND TRADE

### (a) RESEARCH AND PRODUCT DEVELOPMENT

In South Africa, animal biotechnology is regulated under the "GMO" Act of 1997, and any application for research or product development must be approved by the EC. To date, no animal biotechnology product has been submitted for review in South Africa. However, South African scientists have been involved in animal cloning.

South Africa's second cloned calf was born in June 2024. The calf was cloned by two South African veterinarians using genetic material from a 12-year-old Chianina cow. The complex cloning began in 2023, when a tissue sample was taken from the ear of the Chianina cow and brought to a laboratory. Stem cells were cultivated from the sample and inserted into the enucleated egg cell of a slaughtered cow. The resulting embryo was developed in a test tube for seven days before being implanted into a recipient cow, where it successfully grew. The cow was cloned because of her exceptional genetic traits as a breeding animal. South Africa's first cloned animal was a Holstein calf, born in 2003.

### (b) COMMERCIAL PRODUCTION

There is no commercial production of GE or cloned animals in South Africa.

### (c) EXPORTS

South Africa does not export products derived from GE or cloned animals, as no commercial production is currently taking place.

### (d) IMPORTS

South Africa permits the importation of products derived from GE animals that have been approved for food and feed purposes through a process known as commodity clearance. Commodity clearance allows the import of GE products for consumption but prohibits environmental release. To date, no applications for the importation of GE animal products have been submitted to South African regulators.

### (e) TRADE BARRIERS

Not applicable.

## PART E: POLICY

### (a) REGULATORY FRAMEWORK

Animal biotechnology in South Africa is regulated under the "GMO" Act of 1997 (see Chapter 1, Part B, subparagraph a). However, animal cloning is not specifically regulated. Related regulations, such as the Animal Improvement Act and ethical guidelines established by the National Health Research Ethics Council (NHREC), apply to cloning research and development.

The NHREC, established under the National Health Act No. 61 of 2003, provides guidance on ethical issues related to health and research involving humans and animals. The Council monitors international developments in health ethics and collaborates with relevant international organizations to ensure South Africa's policies align with global standards.

### (b) Approvals

No GE animals have been approved for production in South Africa.

### (c) INNOVATIVE BIOTECHNOLOGIES

Not applicable.

### (d) LABELING AND TRACEABILITY

South Africa's Consumer Protection Act, which came into effect on April 1, 2011, includes provisions for mandatory labeling of GE products. However, these regulations are currently on hold. If implemented, the labeling requirements would extend to products derived from GE animals.

Under the Foodstuffs, Cosmetics, and Disinfectant Act, labeling requirements for GE products apply only if the product differs significantly from its non-GE counterpart.

### (e) ADDITIONAL REGULATORY REQUIREMENTS

Not applicable.

### (f) INTELLECTUAL PROPERTY RIGHTS

South Africa is a signatory to the Trade-Related Aspects of International Property Rights (TRIPS) agreement under the WTO. Intellectual Property Rights are supported by the government.

### (g) INTERNATIONAL TREATIES and FORUMS

South Africa is a signatory to several international treaties and forums relevant to animal biotechnology, including:

- The Agreement on the Application of Sanitary and Phytosanitary Measures of the World Trade Organization (WTO-SPS).
- Codex Alimentarius Commission (Codex)*;*
- The World Organization for Animal Health (OIE).

South Africa does not actively participate in discussions related to GE animals within these organizations.

**(h) RELATED ISSUES**

South Africa is home to Africa's first cultivated meat companies, which are pioneering cellular agriculture technology to produce lab-grown meat. Newform Foods (formerly Mzansi Meat Company), founded in 2020, and WildBio (formerly Mogale Meat), are leading efforts to develop affordable, nutritious, and sustainable cell-cultured protein products.

Despite these advancements, challenges remain, including high production costs, consumer acceptance, and regulatory barriers. South Africa's food regulations currently lack classifications for lab-grown meat, delaying its legal sale. Without updated regulations, it may take years before cultivated meat products can enter the market.

## PART F: MARKETING

### (a) PUBLIC/PRIVATE OPINIONS

Post is not aware of any research conducted to assess public opinion regarding livestock clones or GE animals in South Africa.

### (b) MARKET ACCEPTANCE/STUDIES

Not applicable

# CHAPTER 3: MICROBIAL BIOTECHNOLOGY

## PART G: PRODUCTION AND TRADE

### (a) COMMERCIAL PRODUCTION

Several companies in South Africa are engaged in the commercial production of food ingredients. These ingredients include enzymes, additives, flavorings, colorings, vitamins, and seasonings, many of which are produced using microbial biotechnology processes. The industry in represented by two key associations: the South African Association of Food Science and Technology (SAAFOST) and the South African Association of the Flavor and Fragrance Industry (SAAFFI).

In addition to industry efforts, South Africa's research institutions play a significant role in advancing microbial biotechnology. Notable institutions include:

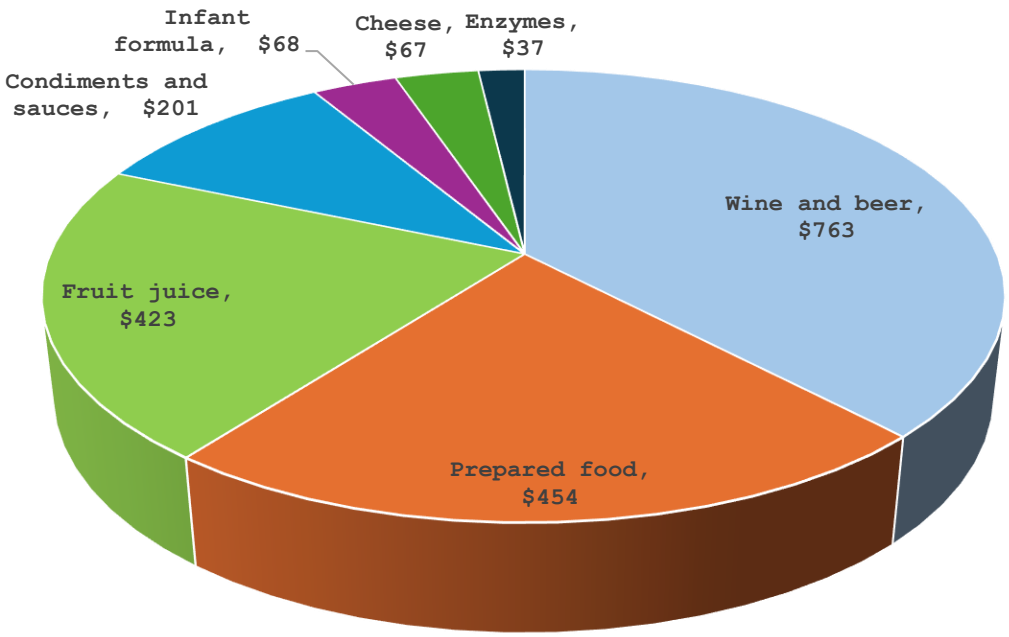
- **The Institute for Microbial Biotechnology and Metagenomics** at the University of the Western Cape (see Institute for microbial biotechnology and metagenomics),
- **Microbial, Biochemical, and Food Biotechnology Department** at the University of the Free State (see Microbiology and biochemistry), and
- **Institute of Biomedical and Microbial Biotechnology** at the Cape Peninsula University of Technology (see Research technology and innovation).

These institutions contribute to innovation and research in microbial biotechnology, supporting the development of new technologies and applications.

### b) EXPORTS

While official statistics on exports of microbial biotechnology products are unavailable, South Africa exported US$2 billion worth of processed products in 2024 that may contain ingredients derived from microbial biotechnology (see Figure 10). These exports primarily fall under value-added categories such as wine and beer, prepared foods, fruit juice, and condiments and sauces. The United States accounted for approximately 6 percent of these exports, valued at US$112 million. This highlights the relatively small share of U.S. trade in South Africa's microbial biotech-derived processed products.

***Figure 10*: *South Africa's Exports of Processed Products that Could Contain Microbial Biotech Derived Ingredients in 2024 (millions of US$)***

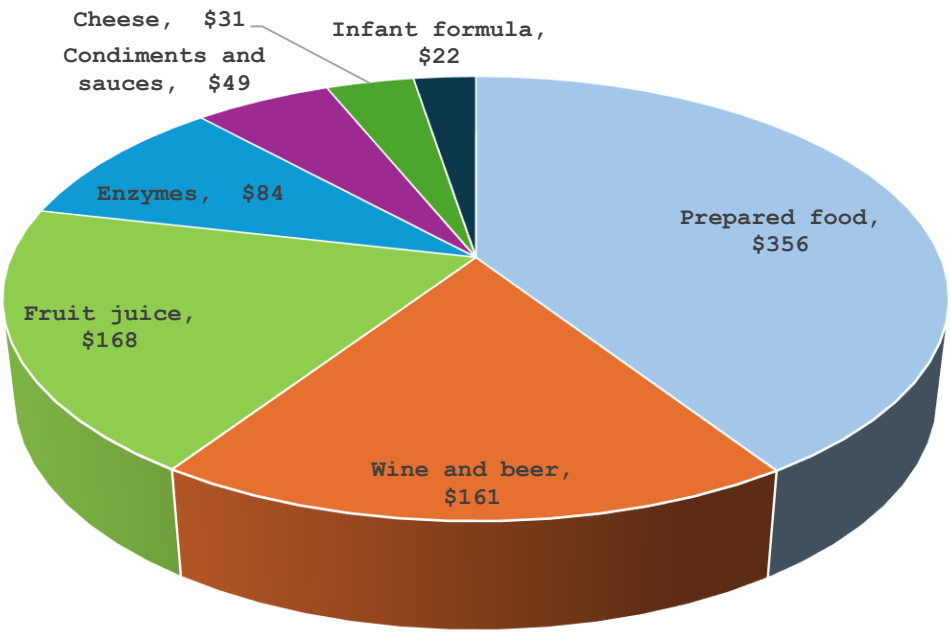



**Source:** FAS/Pretoria using Trade Data Monitor LLC data

**c) IMPORTS**

In 2024, South Africa imported US$872 million worth of food ingredients, such as enzymes, or processed products that may contain microbial biotech-derived food ingredients (see Figure 11). These imports included US$44 million in processed products that potentially contain microbial biotech-derived food ingredients from the United States. Additionally, South Africa imported US$84 million worth of microbial biotech-derived enzymes in 2024, with US$8 million sourced from the United States.

***Figure 11:*** *South Africa's Imports of Processed Products that Could Contain Microbial Biotech Derived Ingredients in 2024 (millions of US$)*




**Source:** FAS/Pretoria using Trade Data Monitor LLC data

### d) TRADE BARRIERS

Post is not aware of any specific trade barriers affecting the import or export of processed products containing microbial biotech derived ingredients.

## PART H: POLICY

### a) REGULATORY FRAMEWORK

South Africa does not use a "process-based" review approach for food ingredients derived from microbial biotechnology. Consequently, these ingredients are not regulated under South Africa's "GMO" Act, as outlined in Chapter One, Part B of this report. Instead, food ingredients are governed by the Foodstuffs, Cosmetics, and Disinfectants Act No. 54 of 1972 (Foodstuffs, Cosmetics and Disinfectants Act), which includes specific regulations for food additives, food colorants, and microbiological standards.

Under this framework, South Africa's regulations for food additives, food colorants, and microbiological standards are developed and administered by the Ministry of Health through its Food Control Division. This Division also represents the Department of Health on the EC of the "GMO" Act and serves as South Africa's Codex point of contact.

Table 6 provides a detailed list of applicable regulations for additives, food colorants, and microbiological standards in South Africa. These regulations also outline requirements for the use of additives, including labeling standards.

***Table 6:*** *Existing Food Additives, Food Colorant and Microbiological Standards Regulations in South Africa (with website link)*

| Name of Regulation | Website link |
|---|---|
| • Regulations relating to the use of sweeteners in foodstuffs (R733/201) | Download |
| • Codex General Standards for Food Additives | Download |
| • Regulations relating to food colorants (R1055/1996) | Download |
| • Miscellaneous additives in foodstuffs | Download |
| • Regulations governing microbiological standards for foodstuffs and related matters | Download |

**Source:** Department of Health Food Control Division

In cases where specific regulations for an additive are absent, South Africa typically follows the General Standard for Food Additives (GSFA) established by the Codex Alimentarius Commission (CAC). If an additive is not included on South Africa's positive list or covered by Codex, exporters can request approval from the Department of Health to use the additive. However, this process can be lengthy, as the Department of Health may require supporting evidence to demonstrate that additives are safe for consumption.

### b) APPROVALS

Permitted additives and colorants are listed in the specific regulations outlined in Table 6.

### c) LABELING AND TRACEABILITY

Labeling of GE-derived products in South Africa is regulated under the Foodstuffs, Cosmetics, and Disinfectants Act of 1972 (Regulation 25) and the 2011 Consumer Protection Act. For a detailed description of these laws, refer to Chapter 1, Part B, sub-paragraph g (Labeling and Traceability) of this report.

General labeling regulations for processed foodstuffs and liquor also fall under the Foodstuffs, Cosmetics, and Disinfectants Act. Inspectors from the Ministry of Health at ports of entry are responsible for ensuring compliance with labeling requirements. Current regulations do not mandate the inclusion of nutritional information tables on labels. However, if a label includes nutritional information, it must comply with existing labeling standards (see the Foodstuffs, Cosmetics, and Disinfectants Act of 1972).

In 2023, the South African Minister of Health issued Government Notice (R.3337), inviting public comments on a draft regulation regarding the labeling and advertising of food products under the Foodstuffs, Cosmetics, and Disinfectants Act of 1972.

The draft regulation emphasizes that no person may manufacture, import, sell, donate, or offer pre-packaged foodstuffs for sale unless the products are labeled in accordance with the regulation. Labels must provide accurate information about the product's character, origin, composition, quality, nutritional value, and time and place of manufacture. The regulation also specifies requirements for font sizes, product descriptions, country-of-origin declarations, and prohibited statements (see USDA South Africa Issues New Draft Regulation Food Labelling).

If implemented, the draft regulations could have significant and potentially arbitrary impacts on local food manufacturers and imported products. The deadline for public comments on the draft regulation was September 21, 2023. As for this writing, the Department of Health is still reviewing the submitted comments. FAS/Pretoria will continue to monitor developments and provide updates as the situation evolves.

### d) MONITORING AND TESTING

South Africa does not actively test for evidence of genetic engineering in imports and exports of processed products.

### e) ADDITIONAL REGULATORY REQUIREMENTS

Not applicable

### f) INTELLECTUAL PROPERTY RIGHTS (IPR)

South Africa is a signatory to the Trade-Related Aspects of International Property Rights (TRIPS) agreement of the WTO; hence Intellectual Property Rights are supported by the government.

### g) RELATED ISSUES

No additional issues related to microbial biotechnology have been identified beyond those covered in this report.

## PART I: MARKETING

### a) PUBLIC/PRIVATE OPINIONS

FAS/Pretoria is not aware of any research assessing public opinion on microbial biotechnology in South Africa. Public awareness of microbial biotechnology remains limited, and no strong positive or negative opinions have been established.

## b) MARKET ACCEPTANCE/STUDIES

South Africa's advanced food sector drives demand for food ingredients, including those derived from microbial biotechnology. While no specific studies on market acceptance have been identified, microbial biotech-derived ingredients are widely used and accepted within the food industry. For further insights, refer to reports by FAS/Pretoria's South Africa Food Processing Ingredients report.

## APPENDIX

***Table A1:*** *GE plant events approved for general release in South Africa*

| Company | Event | Crop | Trait | Year approved |
|---|---|---|---|---|
| BASF South Africa | GHB614 x LLCotton25 | Cotton | Herbicide tolerant | 2023 |
| Bayer | MON87427 | Corn | Herbicide tolerant | 2023 |
| Corteva | DP-056113-9 | Corn | Pollination Control System | 2023 |
| Corteva | MON89034xTC1507xMIR162x NK603xDAS-40278-9 | Corn | Insect resistant Herbicide tolerant | 2023 |
| Corteva | DAS-44406-6xDAS-81419-2 | Soybean | Insect resistant Herbicide tolerant | 2022 |
| Corteva | DAS-44406-6 | Soybean | Herbicide tolerant | 2022 |
| Syngenta | MIR162 | Corn | Insect resistant | 2022 |
| Bayer | MON87701xMON89788 | Soybeans | Insect resistant Herbicide tolerant | 2021 |
| Syngenta | BT11xMIR162xGA21 | Corn | Insect resistant Herbicide tolerant | 2021 |
| Syngenta | BT11xMIR162x MON89034xGA21 | Corn | Insect resistant Herbicide tolerant | 2021 |
| Bayer | MON87427xMON89034x MIR162xNK603 | Corn | Insect resistant Herbicide tolerant | 2020 |
| Dow AgroSciences SA | DAS40278-9 | Corn | Herbicide tolerant | 2019 |
| Dow AgroSciences SA | MON89034xTC1507xNK603xD AS40278-9 | Corn | Herbicide tolerant | 2019 |
| Dow AgroSciences SA | DAS40278-9xNK603 | Corn | Insect resistant Herbicide tolerant | 2019 |
| Dow AgroSciences SA | MON89034xTC1507xNK603 | Corn | Insect resistant Herbicide tolerant | 2018 |
| Monsanto | MON87460 | Corn | Drought tolerance | 2015 |
| Du Pont Pioneer | TC1507 x MON810 x NK603 | Corn | Insect resistant Herbicide tolerant | 2014 |
| Du Pont Pioneer | TC1507 x MON810 | Corn | Insect resistant Herbicide tolerant | 2014 |

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|---|---|---|---|---|
| Du Pont Pioneer | TC1507 | Corn | Insect resistant<br>Herbicide tolerant | 2012 |
| Syngenta | BT11xGA21 | Corn | Insect resistant<br>Herbicide tolerant | 2010 |
| Syngenta | GA21 | Corn | Herbicide tolerant | 2010 |
| Monsanto | MON89034xNK603 | Corn | Insect resistant<br>Herbicide tolerant | 2010 |
| Monsanto | MON89034 | Corn | Insect resistant | 2010 |
| Monsanto | Bollgard II x<br>RR flex (MON15985 x<br>MON88913) | Cotton | Insect resistant<br>Herbicide tolerant | 2007 |
| Monsanto | MON88913 | Cotton | Herbicide tolerant | 2007 |
| Monsanto | MON810 x NK603 | Corn | Insect resistant<br>Herbicide tolerant | 2007 |
| Monsanto | Bollgard RR | Cotton | Insect resistant<br>Herbicide tolerant | 2005 |
| Monsanto | Bollgard II, line 15985 | Cotton | Insect resistant | 2003 |
| Syngenta | Bt11 | Corn | Insect resistant | 2003 |
| Monsanto | NK603 | Corn | Herbicide tolerant | 2002 |
| Monsanto | GTS40-3-2 | Soybeans | Herbicide tolerant | 2001 |
| Monsanto | RR lines 1445 & 1698 | Cotton | Herbicide tolerant | 2000 |
| Monsanto | Line 531/Bollgard | Cotton | Insect resistant | 1997 |
| Monsanto | MON810/Yieldgard | Corn | Insect resistant | 1997 |

**Source:** FAS/Pretoria using data from the Department of Agriculture

***Table A2:*** *GE plant events approved for trial release from 2020*

| Company | Event | Crop | Trait | Year approved |
|---|---|---|---|---|
| **Bayer** | MON87427 x MON89034 x MIR162 x NK603 | Corn | Herbicide tolerance<br>Insect resistant | 2020 |
| | MON87460 x MON810 | Corn | Insect resistant<br>Abiotic resistant | 2020 |
| | MON87701 x MON89788 | Soybeans | Herbicide tolerance<br>Insect resistant | 2020 |
| | MON87460 x MON810 | Corn | Insect resistant<br>Drought tolerance<br>Antibiotic resistant<br>Abiotic tolerance | 2021 |
| | MON87427 | Corn | Herbicide tolerance | 2021 |
| | MON95379 | Corn | Insect resistant | 2024 |
| | MON87751 x MON87701 x MON87708 x MON89788 | Soybeans | Herbicide tolerance<br>Insect resistant | 2024 |
| | MON87427 x MON89034 x MIR162 | | Herbicide tolerance<br>Insect resistant | 2024 |
| | MON87708 x MON89788 | Soybeans | Herbicide tolerance | 2024 |
| | MON87427 x MON95379 x MIR162 | Corn | Herbicide tolerance<br>Insect resistant | 2024 |
| | MON87427 x MON95379 x MIR162 x NK603 | Corn | Herbicide tolerance<br>Insect resistant | 2024 |
| **Bioceres** | HB4 | Soybean | Herbicide tolerance<br>Abiotic tolerance | 2022 |
| | HB4 x GTS-40-3-2 | Soybean | Herbicide tolerance<br>Abiotic tolerance | 2022 |
| **Corteva** | TC1507 x MIR162 x NK603 | Corn | Herbicide tolerance<br>Insect resistant | 2021 |
| | DAS-44406-6 | Soybeans | Herbicide tolerance | 2022 |
| | DAS-81419-2 x DAS-44406- | Soybeans | Herbicide tolerance<br>Insect resistant | 2022 |
| | DP-056113-9 | Corn | Herbicide tolerance | 2022 |

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|---|---|---|---|---|
| | MON89034 x TC1507 x MIR162 x NK603 x DAS40278-9 | Corn | Herbicide tolerance Insect resistant | 2022 |
| | NK603 x T25 x DAS-40278-9 | Corn | Herbicide tolerance | 2022 |
| | TC1507 x NK603 | Corn | Herbicide tolerance Insect resistant | 2024 |
| | DP202216 | Corn | Herbicide tolerance Insect resistant | 2024 |
| | DP910521 | Corn | Herbicide tolerance Insect resistant | 2024 |
| **Dow AgroSciences** | DAS-44406-6 | Soybeans | Herbicide tolerance | 2020 |
| | DAS-81419-2 x DAS-44406- | Soybeans | Herbicide tolerance Insect resistant | 2020 |
| **Pioneer** | NK603 x T25 x DAS-40278-9 | Corn | Herbicide tolerance | 2020 |
| | DP-056113-9 | Corn | | 2020 |
| | TC1507 x MIR162 x NK603 | Corn | Herbicide tolerance Insect resistant | 2020 |
| | MON89034xTC1507xMIR162xNK603x DAS40278-9 | Corn | Herbicide tolerance Insect resistant | 2020 |
| | TC1507 x NK603 | Corn | Herbicide tolerance Insect resistant | 2021 |
| **Syngenta** | MIR162 | Corn | Insect resistant | 2020 |
| | BT11xMIR162xGA21 | Corn | Herbicide tolerance Insect resistant | 2020 |
| | MIR162 | Corn | Insect resistant | 2021 |
| | BT11xMIR162xGA21 | Corn | Herbicide tolerance Insect resistant | 2021 |
| | BT11xMIR162xMON89034xGA21 | Corn | Herbicide tolerance Insect resistant | 2021 |
| | BT11xMIR162xNK603 | Corn | Herbicide tolerance Insect resistant | 2024 |
| | BT11xMIR162xMON89034xNK603 | Corn | Herbicide tolerance Insect resistant | 2024 |
| **BASF** | GHB614xLLCotton25 | Cotton | Herbicide tolerance | 2021 |

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|---|---|---|---|---|
| **Sensako** | HB4 | Soybeans | Abiotic Resistant Herb tolerance | 2020 |

**Source:** FAS/Pretoria using data from the Department of Agriculture

***Table A3:*** *GE events with commodity clearance*

| Company | Event | Crop | Trait | Year approved |
|---|---|---|---|---|
| Syngenta | MZIR260 | Corn | Insect resistance | 2025 |
| Bayer | MON94313 x MON89788 | Soybean | Herbicide tolerance | 2025 |
| Syngenta | Bt11 x MIR162 x NK603 | Corn | Insect resistance, Herbicide tolerance | 2025 |
| Syngenta | Bt11 x MZIR098 x DP4114 x NK603 | Corn | Insect resistance, Herbicide tolerance | 2025 |
| Syngenta | Bt11 x TC1507 x NK603 | Corn | Insect resistance, Herbicide tolerance | 2025 |
| Corteva | DAS1131 | Corn | Insect resistance, Herbicide tolerance | 2024 |
| Syngenta | Bt11 x MIR162 x TC1507 x NK603 | Corn | Insect resistance, Herbicide tolerance | 2024 |
| Syngenta | Bt11 x MIR162 x MZIR098 x DP4114 x NK603 | Corn | Insect resistance, Herbicide tolerance | 2024 |
| Corteva | DP202216 x NK603 x DAS-40278-9 | Corn | Enhanced grain yield, Herbicide tolerance | 2023 |
| Syngenta | 3272 x Bt11 x MIR162 x GA21 | Corn | Insect resistance, Herbicide tolerance | 2023 |
| Corteva | DP202216 | Corn | Enhanced grain yield, Herbicide tolerance | 2023 |
| Bioceres | HB4 | Soybean | Abiotic resistance, Herbicide tolerance | 2022 |
| Trigall Genetics | HB4 | Wheat | Abiotic resistance, Herbicide tolerance | 2022 |
| Syngenta | 3272 x Bt11 x MIR162 x MIR604 x TC1507 x 5307 x GA21 | Corn | Insect resistance, Herbicide tolerance | 2022 |
| Corteva | NK603 x T25 x DAS-40278-9 | Corn | Herbicide tolerance | 2021 |
| Pioneer Hi-Bred RSA (Pty) Ltd | DAS-81419-2 x DAS-44406-6 | Soybean | Insect resistance, Herbicide tolerance | 2021 |
| BASF | GMB151 | Soybean | Insect resistance, Herbicide tolerance | 2021 |
| BASF | GHB811 | Cotton | Herbicide tolerance | 2021 |
| Pioneer Hi-Bred RSA (Pty) Ltd | MON89034 x TC1507 x MIR162 x NK603 x DAS- | Corn | Insect resistance, Herbicide tolerance | 2020 |

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|---|---|---|---|---|
| | 40278- 9 | | | |
| Monsanto | MON87427 x MON87419 x NK603 | Corn | Insect resistant<br>Herbicide tolerant | 2020 |
| Monsanto | MON87427 x MON89034 x MIR162 x MON87419 x NK603 | Corn | Insect resistant<br>Herbicide tolerant | 2020 |
| Monsanto | MON87427 x MON89034 x MON810 x MIR162 x MON87411 x MON87419 | Corn | Insect resistant<br>Herbicide tolerant | 2020 |
| Monsanto | MON87427 x MON89034 x MON87419 x NK603 | Corn | Insect resistant<br>Herbicide tolerant | 2018 |
| Monsanto | MON87427 x MON89034 x TC1507 x MON87411 x DAS59122-7 x MON87419 | Corn | Insect resistant<br>Herbicide tolerant | 2018 |
| Monsanto | MON87751 x MON87701 x MON87708 x MON89788 | Soybeans | Insect resistant<br>Herbicide tolerant | 2018 |
| Bayer | FG72 x A5547-127 | Soybeans | Herbicide tolerant | 2018 |
| DowAgroSciences | MON89034 x TC1507 x MIR162 x NK603 | Corn | Insect resistant<br>Herbicide tolerant | 2018 |
| Syngenta | BT11 x MIR162 x MIMR604 x 5307 x GA21 | Corn | Insect resistant<br>Herbicide tolerant | 2018 |
| Monsanto | MON87705 x MON87708 x MON89788 | Soybeans | Herbicide tolerant | 2018 |
| Monsanto | MON87427 x MON87460 x MON89034 x TC1507 x MON87411 x DAS-59122-7 | Corn | Insect resistant<br>Herbicide tolerant<br>Drought tolerance | 2018 |
| Monsanto | MON87427 x MON89034 x MIR162 x MON87411 | Corn | Insect resistant<br>Herbicide tolerant | 2018 |
| Monsanto | MON87427 x MON89034 x TC1507 x MON87411 x DAS-59122-7 | Corn | Insect resistant<br>Herbicide tolerant | 2018 |
| Monsanto | MON87427 x MON87460 x MON89034 x MIR162 x NK603 | Corn | Insect resistant<br>Herbicide tolerant<br>Drought tolerance | 2018 |
| Monsanto | MON87708 x MON89788 x A5547-127 | Soybeans | Herbicide tolerant | 2018 |
| Syngenta | BT11 x MIR162 x MON89034 | Corn | Insect resistant<br>Herbicide tolerant | 2018 |
| Monsanto | MON87427 x MON89034 x MON88017 | Corn | Insect resistant<br>Herbicide tolerant | 2017 |
| Monsanto | MON89034 x MIR162 | Corn | Insect resistant | 2017 |
| Syngenta | BT11 x MIR162 x MON89034 x GA21 | Corn | Insect resistant<br>Herbicide tolerant | 2017 |

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|---|---|---|---|---|
| Du Pont Pioneer | DP114 x MON810 x MIR604 x NK603 | Corn | Insect resistant<br>Herbicide tolerant | 2017 |
| Monsanto | MON87705 x MON89788 | Soybean | Herbicide tolerant<br>Modified oil/fatty acid | 2016 |
| Monsanto | MON87708 x MON89788 | Soybean | Herbicide tolerant | 2016 |
| Bayer | FG72 | Soybean | Herbicide tolerant | 2016 |
| Bayer | A5547-127 | Soybean | Herbicide tolerant | 2016 |
| DowAgroSciences | DAS68416-4 x MON89788-1 | Soybean | Herbicide tolerant | 2016 |
| DowAgroSciences | DAS81419-2 | Soybean | Insect resistant | 2016 |
| Syngenta SA | 3272 x BT11 x MIR604 x GA21 | Corn | Insect resistant<br>Herbicide tolerant | 2016 |
| Du Pont Pioneer | TC1507 x MON810 x MIR162 | Corn | Insect resistant<br>Herbicide tolerant | 2016 |
| Syngenta SA | BT11 x TC1507 x GA21 | Corn | Insect resistant<br>Herbicide tolerant | 2016 |
| Monsanto | MON87427 x MON89034 x MIR162 x NK603 | Corn | Insect resistant<br>Herbicide tolerant | 2016 |
| Monsanto | MON87427 x MON89034 x 1507 x MON88017 x 59122 | Corn | Insect resistant<br>Herbicide tolerant | 2016 |
| Monsanto | MON87460 x NK603 | Corn | Drought tolerance<br>Herbicide tolerant | 2016 |
| Monsanto | MON87427 x MON89034 x NK603 | Corn | Insect resistant<br>Herbicide tolerant | 2016 |
| Du Pont Pioneer | TC1507 x MON810 x MIR162 x NK603 | Corn | Insect resistant<br>Herbicide tolerant | 2016 |
| Du Pont Pioneer | TC1507 x MIR604 x NK603 | Corn | Insect resistant<br>Herbicide tolerant | 2016 |
| Du Pont Pioneer | TC1507 x MON810 x MIR604 x NK603 | Corn | Insect resistant<br>Herbicide tolerant | 2016 |
| Du Pont Pioneer | TC1507 x 59122 x MON810 x NK603 | Corn | Insect resistant<br>Herbicide tolerant | 2016 |
| Du Pont Pioneer | TC1507 x 59122 x MON810 x MIR604 x NK603 | Corn | Insect resistant<br>Herbicide tolerant | 2016 |
| DowAgroSciences | DAS81910-7 | Cotton | Herbicide tolerant | 2016 |
| DowAgroSciences | DAS-24236-5 x DAS-21023-5 | Cotton | Insect resistant | 2016 |
| DowAgroSciences | MON89034 x TC1507 x MON88017 x DAS-59122-7 x DAS-40278-9 | Corn | Insect resistant<br>Herbicide tolerant | 2016 |
| DowAgroSciences | MON89034 x TC1507 x NK603 x DAS-40278-9 | Corn | Insect resistant<br>Herbicide tolerant | 2016 |
| Syngenta | 3272 x BT11 x MIR604 x TC1507 x 5307 x GA21 | Corn | Insect resistant<br>Herbicide tolerant | 2016 |

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|---|---|---|---|---|
| Du Pont Pioneer | DP4114 | Corn | Insect resistant<br>Herbicide tolerant | 2016 |
| Monsanto | NK603 x T25 | Corn | Herbicide tolerant | 2016 |
| Syngenta | MZHG0JG | Corn | Herbicide tolerant | 2016 |
| Du Pont Pioneer | DP73496 | Canola | Herbicide tolerant | 2016 |
| Monsanto | MON87460 x MON89034 x NK603 | Corn | Drought tolerance<br>Insect resistant<br>Herbicide tolerant | 2015 |
| Syngenta | BT11 x MIR162 | Corn | Insect resistant<br>Herbicide tolerant | 2015 |
| Monsanto | MON87460 x MON89034 x MON88017 | Corn | Abiotic resistance<br>Insect resistant<br>Herbicide tolerant | 2015 |
| Syngenta | GA21 x T25 | Corn | Herbicide tolerant | 2015 |
| Syngenta | SYHT0H2 | Soybean | Herbicide tolerant | 2014 |
| Syngenta | BT11 x 59122 x MIR604 x TC1507 x GA21 | Corn | Insect resistant<br>Herbicide tolerant | 2014 |
| Syngenta | BT11 x MIR604 x TC1507 x 5307 x GA21 | Corn | Insect resistant<br>Herbicide tolerant | 2014 |
| Syngenta | BT11 x MIR162 x MIR604 x TC1507 x 5307 x GA21 | Corn | Insect resistant<br>Herbicide tolerant | 2014 |
| Syngenta | MIR162 | Corn | Insect resistant | 2014 |
| Monsanto | MON89034 x MON88017 | Corn | Insect resistant<br>Herbicide tolerant | 2014 |
| Monsanto | MON87701 x MON89788 | Soybeans | Insect resistant<br>Herbicide tolerant | 2013 |
| Monsanto | MON89788 | Soybeans | Herbicide tolerant | 2013 |
| DowAgrowScience | DAS-44406-6 | Soybeans | Herbicide tolerant | 2013 |
| DowAgrowScience | DAS-40278-9 | Corn | Herbicide tolerant | 2012 |
| BASF | CV127 | Soybeans | Herbicide tolerant | 2012 |
| DowAgrowScience/ Monsanto | MON89034 x TC1507 x NK603 | Corn | Insect resistant<br>Herbicide tolerant | 2012 |
| Syngenta | MIR604 | Corn | Insect resistant | 2011 |
| Syngenta | BT11 x GA21 | Corn | Insect resistant<br>Herbicide tolerant | 2011 |
| Syngenta | BT11 x MIR604 | Corn | Insect resistant<br>Herbicide tolerant | 2011 |
| Syngenta | MIR604 x GA21 | Corn | Insect resistant<br>Herbicide tolerant | 2011 |
| Syngenta | BT11 x MIR604 x GA21 | Corn | Insect resistant<br>Herbicide tolerant | 2011 |
| Syngenta | BT11 x MIR162 x MIR604 x GA21 | Corn | Insect resistant<br>Herbicide tolerant | 2011 |
| Syngenta | BT11 x MIR162 x GA21 | Corn | Insect resistant | 2011 |

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|---|---|---|---|---|
| | | | Herbicide tolerant | |
| Syngenta | BT11 x MIR162 x TC1507 x GA21 | Corn | Insect resistant<br>Herbicide tolerant | 2011 |
| Pioneer | TC1507 x NK603 | Corn | Insect resistant<br>Herbicide tolerant | 2011 |
| Pioneer | 59122 | Corn | Insect resistant | 2011 |
| Pioneer | NK603 x 59122 | Corn | Insect resistant<br>Herbicide tolerant | 2011 |
| Pioneer | 356043 | Soybean | Herbicide tolerant | 2011 |
| Pioneer | 305423 | Soybean | Higher oleic acid content<br>Herbicide tolerant | 2011 |
| Pioneer | 305423 x 40-3-2 | Soybean | Higher oleic acid content<br>Herbicide tolerant | 2011 |
| DowAgroScience | TC1507 x 59122 | Corn | Insect resistant<br>Herbicide tolerant | 2011 |
| DowAgroScience | TC1507 x 59122 x NK603 | Corn | Insect resistant<br>Herbicide tolerant | 2011 |
| Bayer | LLRice62 | Rice | Herbicide tolerant | 2011 |
| Bayer | LLCotton25 | Cotton | Herbicide tolerant | 2011 |
| Monsanto | MON863 | Corn | Insect resistant | 2011 |
| Monsanto | MON863 x MON810 | Corn | Insect resistant | 2011 |
| Monsanto | MON863 x MON810 x NK603 | Corn | Insect resistant<br>Herbicide tolerant | 2011 |
| Monsanto | MON88017 | Corn | Insect resistant | 2011 |
| Monsanto | MON88017 x MON810 | Corn | Insect resistant | 2011 |
| DowAgroScience & Monsanto | MON89034 x TC1507 x MON88017 x 59122 | Corn | Insect resistant<br>Herbicide tolerant | 2011 |
| Monsanto | MON810 x NK603 | Corn | Insect resistant<br>Herbicide tolerant | 2004 |
| Monsanto | MON810 x GA21 | Corn | Insect resistant<br>Herbicide tolerant | 2003 |
| Pioneer Hi-Bred | TC1507 | Corn | Insect resistant<br>Herbicide tolerant | 2002 |
| Monsanto | NK603 | Corn | Herbicide tolerant | 2002 |
| Monsanto | GA21 | Corn | Herbicide tolerant | 2002 |
| Syngenta | Bt11 | Corn | Insect resistant | 2002 |
| AgrEvo | T25 | Corn | Herbicide tolerant | 2001 |
| Syngenta | Bt176 | Corn | Insect resistant | 2001 |
| AgrEvo | Topas 19/2, Ms1Rf1, Ms1Rf2, Ms8Rf3 | Oilseed rape | Herbicide tolerant | 2001 |
| AgrEvo | A2704-12 | Soybean | Herbicide tolerant | 2001 |

**Source:** FAS/Pretoria using data from the Department of Agriculture

**Attachments:**

No Attachments