IITA Position Statement on Genetically Modified (GM) Crops

Introduction

The International Institute of Tropical Agriculture (IITA), a CGIAR center, is Africa's leading research partner in addressing urgent challenges such as food insecurity, poverty, malnutrition, climate change, and inequality among youth and women. The institute's mission is to transform agriculture through cutting-edge science, innovative partnerships, and capacity building, with a strong focus on securing Africa's food future.

To achieve this goal, IITA focuses on improving key staple crops such as banana, plantain, cassava, cowpea, maize, soybean, and yam. The Institute integrates modern tools such as biotechnology with conventional breeding techniques to increase yields, enhance nutrition, and strengthen resilience against pests, diseases, and climate stress. By modernizing crop improvement and plant breeding, IITA ensures that farmers and consumers have access to better choices, while making the benefits of science, including genetically modified (GM) crops, available to smallholder communities in line with national policies and regulations.

Why Do GM Crops Matter?

After more than 20 years of global use, GM crops have shown clear benefits:

- Reduced reliance on chemical pesticides
- Higher yields and greater profits for farmers
- Positive contributions to environmental sustainability

These impacts are even stronger in developing countries than in developed ones. GM technology also makes it possible to introduce traits that cannot be achieved through conventional breeding, while shortening the time required to develop and release improved crop varieties. This ensures that farmers can access effective solutions more rapidly.

Use of GM Technology at IITA

IITA, in line with the GM policy of CGIAR, employs GM technologies only when they provide clear advantages over conventional approaches.

1. **When conventional methods are insufficient:** GM technology is used when traditional breeding cannot deliver the needed improvements, or when no effective alternatives exist. *Examples:* Bananas are highly vulnerable to Banana Xanthomonas Wilt (BXW), a devastating disease with no natural resistance in cultivated varieties. BXW can be managed through phytosanitary practices, such as uprooting infected plants and sterilizing farm tools, but these methods are extremely labor-intensive and not preferred by farmers. In addition, there are no chemical control options available. To address this challenge, IITA scientists introduced defense genes from wild type banana into farmer-preferred varieties, giving them effective protection against BXW.

2. Plantains are often heavily damaged by root-knot nematodes, which reduce yields and shorten plantation lifespan. Conventional breeding for broad-spectrum resistance to several species of nematodes is extremely difficult. By introducing resistance genes into farmer-preferred plantain varieties, IITA developed nematode-resistant plantains that maintain higher productivity and support food security.
3. **When the advantages are substantial:** GM approaches are applied when they bring significant benefits—such as cost reductions, yield gains, or critical trait enhancements that improve farmer livelihoods.

   Example: During outbreaks of bacterial wilt that destroyed banana plantations across East Africa, leaving households without food or income, GM technology provided an effective solution to restore banana productivity.

   Nematode-resistant plantains offer farmers healthier plants, longer plantation lifespans, and higher yields, advantages that cannot be matched by conventional methods. This translates into improved household food security and income stability.

Beyond disease and pest resistance, GM technology expands opportunities for crop improvement by enabling traits that conventional breeding cannot easily achieve. These include improving nutritional content, reducing natural allergens or toxins, and accelerating the release of improved varieties so that farmers can benefit sooner.

Decision tree for using GM technology at IITA

IITA uses a decision tree framework to guide the selection of GM technology for crop improvement. This framework helps evaluate when GM technology is appropriate, considering multiple factors such as:

1. **Does the trait have no effective and efficient alternative?**
   - If **yes**, proceed using GM technology.
   - If **not**, explore other breeding methods.
2. **Is the trait critical for food security, sustainability, or livelihoods?**
   - If **yes**, proceed using GM technology.
   - If **no**, consider other options.
3. **Are there national regulations supporting the use of GM technology?**
   - If **yes**, proceed using GM technology.
   - If **no**, choose another method.
4. **Can the GM technology be effectively implemented and regulated?**
   - If **yes**, consider implementing GM technology.
   - If **no**, reassess potential risks and seek alternative methods.

Governance of GM Products at IITA

Country sovereignty and biosafety compliance

IITA does not pursue nor advocate GM technologies at the expense of human or animal health, environmental safety, or biodiversity. All activities comply with host and partner country biosafety policies, regulations, and procedures. IITA acknowledges and endorses the safe transfer, handling, and use of genetic engineering tools, minimizing potential adverse effects that the technology may have on the conservation and sustainable use of biological diversity as stated in the 2000 international Cartagena Protocol on Biosafety to the Convention on Biological Diversity (“Cartagena Protocol”).

IITA respects the sovereignty of each country to determine if, when, and how GM technologies are used within its territory, and provides technical support upon request. Research involving GM or recombinant DNA technologies is conducted only in countries with established biosafety frameworks and official regulatory agencies.

Rigorous risk assessments, based on internationally accepted standards, are conducted to evaluate the potential effects of GM crops on human health and the environment. If a potential negative impact is identified, further development of the GM product is discontinued.

IITA internal management

To safeguard product integrity, IITA enforces strict policies and procedures for the safe handling of GM crops and living modified organisms, including seeds developed internally or obtained from partners. These measures are embedded within the institute's quality management system and follow internationally stewardship standards.

The Biotechnology Program Lead, trained in biosafety and regulatory compliance, approves and oversees all GM research, supported by senior management. Oversight is further provided by the Institutional Biosafety Committee (IBC) and the Bioethics Committee, ensuring compliance, transparency, and science-based risk management.

GM Product Stewardship at IITA

Responsible development and deployment of GM crops require full stewardship throughout the product life cycle, from the laboratory to potential farmer use. Stewardship ensures product integrity, including the quality, safety, and stability of traits in new plant varieties, regulatory compliance, environmental and food safety, and transparency in decision-making. IITA follows a zero-tolerance policy on regulatory non-compliance**.**

While the institute focuses primarily on research and development, it is equally committed to:

- Providing transparent information and data on GM products
- Strengthening quality assurance systems
- Supporting stewardship practices among partners and regulators

IITA is a certified member of Excellence Through Stewardship (ETS), a program offered by the Global Stewardship Group that promotes the adoption of product stewardship programs and quality management systems for the full life cycle of agricultural biotechnology products.

IITA also adheres to the CGIAR Ethics Code and promotes global standards for stewardship and responsible innovation, ensuring GM technologies are developed in ways that benefit farmers, consumers, and the environment.

Annex
GM Crops – Frequently Asked Questions

1. What is a GMO?
A genetically modified organism (GMO) is a plant, animal, or microorganism whose genetic material has been altered using different biotechnology tools to provide useful traits such as better resistance to pests, diseases, or drought. It allows selected individual genes to be transferred from one organism to another, between non-related species. This approach is often faster than traditional breeding methods.

Foods made from GMOs are called GM foods.

2. Are GM foods safe to eat?
Yes. Approved GM foods are safe for consumption. GM foods are tested more strictly than conventional foods. Before approval, every GM crop must go through detailed checks to ensure:

- It is as nutritious as conventional varieties
- It does not cause allergies or harm to humans or animals
- It is safe for the environment

Over 20 years of use around the world have shown that approved GM foods are just as safe as conventional foods. National and International scientific organizations have reached similar conclusions and information from safety studies is publicly available. Safety reviews continue even after crops are released, following international standards such as the Codex Alimentarius.

3. How is the safety of GM foods checked?
Unlike traditional crops, GM crops must pass strict food and environmental safety assessments before release. In countries with established biosafety frameworks, national authorities have specific systems for the rigorous evaluation of GMOs and effects of GM foods on human and animal health, nutrition and the environment.

If any risk is found, the crop is not approved.

4. Can countries choose whether or not to allow GM crops?
Yes. Each country exercises sovereign control over GM crops. They decide for themselves if, when, and how GM crops are approved for use. Every country has its regulatory agency overseeing GMOs and its own laws governing their use. Regulations differ by country, and no GM crop can be grown without government approval.

5. Can a farmer grow both traditional and GM crops?
Yes. Conventional and GM agriculture can co-exist. Many farmers choose to grow both for different markets and purposes.

6. Are GM seeds expensive, and can farmers replant them?
Not necessarily. Each country uses local seed companies to manage its own GM seed production and distribution.

IITA develops GM varieties with public partners to ensure they are royalty-free and accessible to smallholder farmers. The replanting issue depends on the seed's nature, e.g., a hybrid variety from open pollination or a clonal propagule.

In crops like banana, farmers can replant suckers from GM plants just as they do with conventional bananas.

7. Will GM crop varieties replace Africa's indigenous varieties?
No. The purpose of GM technology is to protect and strengthen local crops, not replace them. For example, by adding traits such as resistance to drought, pests, or diseases, GM methods help ensure that indigenous varieties continue to thrive on farmers' fields. This is often quicker and more precise than traditional breeding, which can sometimes dilute the unique qualities of local varieties.

8. Do GM crops cause soil infertility?
No. Soil infertility problems occur when the same crop is cultivated on the same land repeatedly without adding nutrients, overgrazing, or erosion, regardless of whether crops are GM or not. All crops, GM or non-GM, remove nutrients from the soil, so good soil management is what matters.

9. Can GM crops harm the environment?
No. Approved GM crops are designed and assessed to be environmentally safe. Before release, scientists study their effects on other plants, insects, and ecosystems. IITA conducts rigorous environmental impact assessments to evaluate the risks such as gene flow to wild relatives or effects on non-target organisms. If any risk is detected, further development of the GM crop or its release is halted.

10. Do GM crops reduce biodiversity?
No. In fact, GM crops can help protect biodiversity. For example, pest-resistant GM crops reduce crop losses, helping local varieties survive. Strict measures are also taken to prevent unintended gene flow to wild relatives. GM traits are normally added to local crops without displacing them.

11. Could GM crops lead to socioeconomic inequalities or dependency on biotech companies?
One concern is the potential for economic inequalities if a few large companies monopolize seed technology. However, IITA works with public sector partners to ensure that GM technology is royalty-free and accessible to smallholder farmers. This ensures farmers can access GM crops without financial strain, promoting equitable agricultural development.

12. What happens if a GM crop causes an unintended health effect after its release?
Health and safety remain top priorities. GM crops are monitored even after release. If any health concern arises, national authorities can stop cultivation and the GM product is discontinued. Continuous monitoring and transparency are part of the safety of GM crops.

13. Has IITA released any GM crop varieties?
No. So far IITA has not released any GM crop varieties. All our work is still under research and development.

For more information about GM technologies at IITA, please contact L.Tripathi@cgiar.org

Last updated: 10 February 2026