



Policy Brief

Can Agricultural Biotechnology Impact Food Security in Ethiopia?

Executive summary:

- Biotechnology has wider applications in agriculture.
- Abrupt population rise and emerging agricultural challenges aggravated food insecurity.
- Most of the emerging agricultural challenges cannot be addressed through conventional techniques.
- Agricultural biotechnology is one of the alternative solutions for improving food production and quality to enhance food security.

Introduction

Biotechnology in general has diverse applications in agriculture, health, industry, and environment. However, it is most often interchangeably used in describing genetic engineering, which is a single component of biotechnology in agriculture. This advanced agricultural technique is used for mass multiplication of high economic value crops that have propagation problems and hybrids through tissue culture. It also helps for medium to long-term preservation of genetic resources in cases of extreme climatic conditions like prolonged drought and flooding. Molecular plant breeding

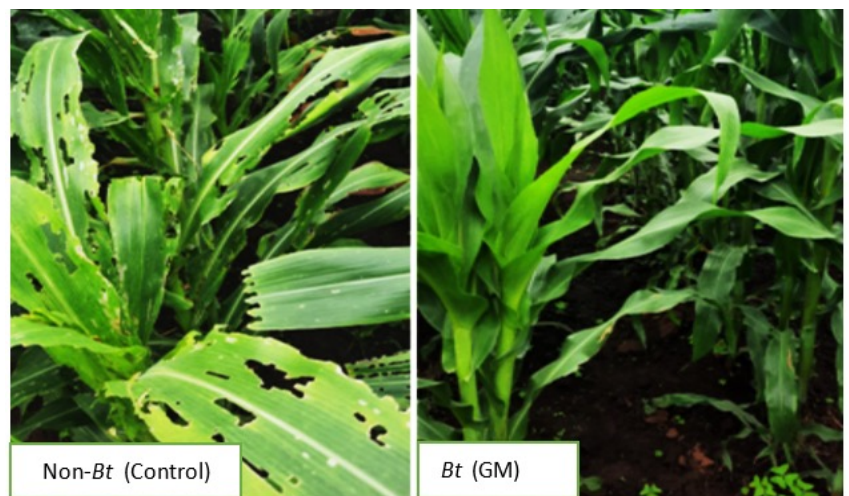


Fig. 1 TELA Maize -Eth Trial for FAW Resistance Evaluation

is another biotechnology technique that is highly important for reducing breeding time, efficiency, and precision. In livestock, molecular breeding is the best technique to breed the desired traits in a shorter time and has multiple industrial and environmental applications in microbiology.

Genetic engineering such as Genetic Modification (GM) and Genome Editing (GE) are recent advances in agriculture. These offer different advantages like product quality improvement, insect resistance, and a solution for other production challenges. The insect-resistant GM maize (TELA Maize) has been found to have over 50% yield advantage in severe fall armyworm (FAW) natural infestation (unpublished CFT data).

Fig. 1 Shows magnificent difference in protection of FAW and stem borer pests at TELA maize trials in Ethiopia.



Fig. 2 Bt Cotton CFT Evaluation in Ethiopia in 2017

The other instance is bollworm resistant (Bt-cotton), which helps to avoid multiple applications of unsafe, environmentally hazardous, and expensive pesticides. The difference in bollworm resistance of GM and non-GM cotton varieties is shown in Fig.2.

Policy Implication

- Improving the policy environment for genetic engineering in Ethiopia is imperative.
- Investing in local research institutions and partnering with the private sector to capacitate genetic engineering is a strategic investment.
- Enhancing investment capacity is critical for evidence-based decision-making processes.
- Functional policy environment is key to harnessing modern biotech techniques that contribute to food and nutrition security.

Conclusion

Biotechnology is an appropriate investment area for the government to attain food security in Sustainable Development Goals. Unless we embrace advanced technologies, it is impossible to combat fast and ever-changing production challenges like the ones resulting from climate. The adoption of advanced technologies will make it possible to feed the fast-growing Ethiopian population which is increasing at an average rate of 2.5%. There is ample evidence showing that agricultural biotechnology can positively impact food security in Ethiopia.

Recommendation:

The application of advanced biotechnology is indispensable for attaining sustainable food and nutrition security in the country, during this era of multifaceted challenges. Agricultural biotechnology is among the modern tools that have been proven effective to boost production and quality. Therefore, policymakers need to focus on creating an enabling environment and building the capacity for biotechnology, particularly in genetic engineering research and development.

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Reference:

- Biosafety South Africa, 2023. <https://biosafety.org.za/information/dig-deeper/compliance/africas-gmo-landscape> accessed on Oct 12, 2023.
- Ethiopian Statistical Services (ESS), 2023. <https://www.statsethiopia.gov.et/wp-content/uploads/2023/08/Population-of-Zones-and-Weredas-Projected-as-of-July-2023.pdf>

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