



TELA MAIZE HYBRID TECHNOLOGY

**FAQs: ALL YOU
NEED TO KNOW**



Frequently Asked Questions for Seed Companies

What is TELA® Maize

TELA® Maize is the brand name for genetically modified (GM) maize hybrids developed by the TELA Maize Project. The hybrids have *Bt* genes that provide protection against stem borer and helps the maize plant tolerate moderate drought. These two genes have been integrated to new maize hybrids which have been bred conventionally for drought tolerance and improved yield.

There are two types of TELA maize that will be produced –an insect resistant (Bt) TELA hybrid (MON 810); and a stacked Drought Tolerant and Insect Resistant (DT+Bt) TELA hybrid (MON87460 + MON810). The new transgenic hybrids will be made available to seed companies in Africa through a royalty-free license from AATF. The TELA Maize Project builds on progress made from a decade of excellent breeding work under the Water Efficient Maize for Africa (WEMA) Project. The word “TELA” is derived from the Latin word *TUTELA* which means “Protection.”



Why should I be interested in TELA maize?

TELA® maize hybrids will provide maize crop with protection against stem borer insect pests and will be more resilient in moderate drought stress conditions. Seed companies licensed by AATF can market the insect protected and drought tolerant GM hybrid maize seed under their private brand to deliver more value to customers and help grow their business.

Who is developing and disseminating TELA maize and why?

The African Agricultural Technology Foundation (AATF) is coordinating the TELA Maize Project that includes national agricultural research systems in Ethiopia, Kenya, Mozambique, South Africa, Tanzania and Uganda; the International Maize and Wheat Improvement Center (CIMMYT) - an internationally funded, non-profit, scientific research, training, and development organization; and Bayer Crop Science (Bayer), a private agricultural company. The project will involve local institutions, both public and private to support attainment of Project goals.

The objective of the TELA Project is to improve food security and rural livelihoods among smallholder maize farmers in Sub-Saharan Africa, through commercialization of transgenic drought-tolerant and insect-protected maize varieties. The Project will provide the technology royalty-free to seed companies in Africa to produce and distribute seed to farmers. The partnership helps build technical breeding and biotechnology capacity as well as support effective seed systems in Africa. TELA Maize Project is funded by the Bill and Melinda Gates Foundation (BMGF) and the United States Agency for International Development (USAID).

How will my seed business benefit from TELA maize?

Seed Companies can receive license rights to produce and commercialize the new TELA® hybrids under their private brand. Licensed seed companies will access the technology royalty-free for them to produce and sell the seed brand to farmers at prevailing market prices. The better yield performance of TELA hybrids, together with improved seed quality will deliver more value to farmers and create more demand and profit potential for the seed brand.

How will farmers benefit TELA maize hybrids?

Farmers' maize crop will have better drought tolerance and protection against stem borers, and partial but significant protection against FAW leading to less cost and exposure to insecticides, improved yields and grain quality. The hybrids will also be more drought tolerant. The TELA Maize seed will reduce risks, improve yields, contribute to food security and better livelihoods for farmers, consumers and the society.



Have African governments given approval for the TELA maize technology?

TELA maize is already approved and in use in South Africa. Other countries are in different stages of the approval process. The maize has undergone regulatory review and evaluation in Kenya and has been approved for National Performance Trials that is awaiting go-ahead from the National Environment Management Agency. In all the countries, this maize will need to pass all regulatory requirements and evaluations before farmers can grow them.

When will TELA maize be available?

Farmers in South Africa are already planting TELA maize. In the other countries, the maize will be available after deregulation by each national government and upon completion of the National Performance Trials (NPTs).

TELA Maize Project

LICENSING

Who is licensing TELA maize hybrids?

As Project leader, the African Agricultural Technology Foundation (AATF) has been licensed the inbred lines, hybrids, and traits developed by the Project partners for sub-licensing to qualified seed companies in Africa. AATF owns the licensing rights and has registered the TELA hybrids in South Africa and is leading the applications for the regulatory approvals for commercial release of the GM traits in the other Project countries.

What obligations are in the TELA maize hybrid license?

The main aspects of the license grants seed companies the right to produce and sell licensed hybrids and traits under their seed brand. Stewardship obligations to maintain genetic and trait purity and quality control as well as insect resistance management are key elements of the contract.



Seed companies can cross traitled inbred lines with their own conventional inbred lines to create unique insect protected and drought tolerant GM hybrids. However, the traitled inbred lines can neither be used for breeding nor multiplied. For stewardship reasons, all companies will be required to purchase the traitled foundation seed from recommended foundation seed companies. Additionally, annual production and sales reports should be sent to AATF for quality control purposes and general uptake monitoring through sales volumes tracking. Companies are encouraged to review their contracts continuously to understand the obligations.

How will the TELA Maize hybrid license fit my specific business needs?

The licenses are intended to provide seed companies with an expanded and enriched product portfolio in the unique traits offered through the TELA technologies specifically insect protection and drought tolerance.

How much do I have to pay for TELA maize license?

No royalties are owed under the licenses. Seed companies should however anticipate incurring additional costs for quality control requirements related to producing certified hybrid seeds such as laboratory tests to check for the presence of the trait.



What is Bayer Crop Science's role in the licensing?

Bayer is not involved in the decisions about which companies will be licensed. AATF has set up an independent review process that does not include Bayer when making decisions about who can be licensed. Bayer has licensed its GM technology to AATF in the Project.

Will TELA maize hybrids licenses be available to all seed companies?

It is the intention of the TELA Maize Project that all legitimate seed companies in Africa have equal access to the TELA technology. AATF as the sub-licensor has set up a review process to identify and decide the companies merit licensing based on standard criteria designed to be as inclusive as possible.

What are the biggest risks for my business if I include TELA Maize Hybrids?

Based on the performance we have seen in GM maize hybrid field testing, the complete protection provided against stem borer and partial but significant protection against fall armyworm, the biggest risk for seed companies will be an underestimation of the impact of the technology in terms of improved productivity by farmers and the seed demand it will create. The biggest risk for seed companies may be in moving too slowly to grow their product portfolio of GM maize hybrids.

A risk that is unfortunately often underestimated is the challenge of meeting the trait genetic purity standards in the hybrid seed production fields. However, with lab tests, it will be very easy and accurate to check for the genetic purity for the trait, and if the seed doesn't meet the quality standards it must be discarded at a loss. Extra effort and investment to ensure proper field management and detasseling are critical to successful GM maize seed production.

Can I get exclusive access to a TELA maize hybrid?

Exclusive licensing is possible, but at the time of initial introduction there will be limited stocks of hybrids available to offer on an exclusive basis. It will, therefore, be very important to follow AATF's marketing advice on how to brand licensed hybrids as private. But, as new converted inbred lines become available and more hybrids can be produced, it may be more feasible to license hybrids exclusively. The Project is also making it possible for seed companies to cross their own proprietary inbred lines with the insect protected and drought tolerant GM inbreds to make unique proprietary TELA® hybrids.



TELA Maize Project

SEED PRODUCTION

Which TELA Maize hybrids will be available for licensing?

Specific list of hybrids will be provided after necessary government approvals and completion of NPTs.

What's different about producing GM maize compared to conventional maize seed?

The main difference is to consider if the GM trait is on the male or the female or on both parents. If the product is the *Bt* trait alone, the trait could be on either the female or male or on both parents. If the product is the stack of the DT and *Bt* traits, then one needs to consider which trait is on the female and which is on the male or if the inbred has both the DT + *Bt*. This information will be made available.

Genetic purity for the traits in the TELA maize can be easily and precisely tested in the laboratory. Although the recommended field production and detasseling process is the same, the consequences of a poor-quality detasseling will be more readily evident with the GM maize and could result in costly write-off of the seed lot that doesn't meet quality standards.

Why can't I produce my own transgenic inbred foundation seed of TELA Maize hybrids?

Because of stewardship requirements and the added importance of trait purity in the GM maize seed sold to farmers, AATF emphasizes that the quality control is most critical in the foundation seed. Under the licensing arrangement therefore, AATF requires that all GM foundation seed is produced under strict quality control standards established by Excellence Through Stewardship (ETS). AATF has currently delegated the responsibility and authority to produce the ETS quality foundation seed to QualiBasic Seed Company (QBS) to ensure all TELA® maize hybrids start from foundation seed which meets high and strict quality standards.

How do I make sure I get the TELA maize transgenic foundation seed I need?

QualiBasic Seed Company (QBS) has account representatives to serve as a direct line of contact for providing the TELA Maize transgenic foundation seed. QBS requires that companies provide their anticipated seed demand at least two seasons in advance of when they will need it to allow sufficient time to produce the foundation seed in the quantity required in a timely manner. It will be important to meet regularly with QBS to plan your portfolio and anticipate your needs for inbred seed well in advance. We expect there will be benefits of economy of scale for common inbred lines across multiple countries and companies from seed companies' engagements with QBS.

Is hybrid seed certification different for Insect protected and drought tolerant GM maize than for conventional maize?

Hybrid seed production rules and standards are the same for conventional and insect protected and drought tolerant GM maize. There is no need for new or different seed laws to produce GM maize – existing seed laws are enough. Production of TELA® maize hybrids are technically the same as for conventional maize. The main difference however, is that once the seed is harvested a simple lab test can be done to test for the presence of the GM trait which is much more precise than current genetic purity tests done for conventional maize seed.

What is the isolation distance required when producing GM maize seed?

Isolation distances for GM maize seed are the same as for conventional maize, the existing seed laws and standards apply equally. Extra caution and strict adherence to the isolation recommendations become more important with the GM maize because the lab tests can detect off-types accurately than current methods used for conventional hybrid maize seed production.



What hybrids can I use for the required refuge seed when growing TELA maize hybrids?

It is not required to use the same “iso-line” conventional hybrid as the refuge for a TELA® hybrid. The criteria for which conventional hybrid can be used as refuge only requires that it be of reasonably similar flowering date, maturity and plant stature to the TELA® maize. In many cases, one conventional hybrid can serve as the refuge for several different TELA® maize hybrids. Specific decisions of which hybrid to use as refuge should be reviewed on a case by case basis with breeders to ensure the refuge hybrid selected is non Bt and meets the flowering, maturity and stature criteria.

Who is responsible for producing the refuge hybrid seed for use in TELA maize production?

Each licensed seed company is responsible to ensure they have their own refuge hybrid seed.

What should I expect for yield in certified hybrid seed production?

As with conventional maize seed production, the range of hybrid seed yield can be highly variable depending on numerous factors. There is no reason to presume that GM hybrid seed production yields will be substantially different from conventional hybrids.

There can be advantages for the GM seed production because the *Bt* trait protects the inbred lines from insects that can severely reduce yields. The GM traits can, however, sometimes slightly change an inbred line, so it doesn't act exactly the same as the conventional isoline. As with conventional hybrid seed production, it is very important to conduct good seed production research to inform seed production decisions to improve seed yields.

Do I need to spray against pests and diseases when producing Insect protected and drought tolerant GM maize seed?

Best practices for GM maize seed production are the same as for conventional seed. Seed production staff should regularly scout fields and use appropriate crop protection products judiciously and in a timely manner when necessary. The inbred line with the *Bt* trait will help protect against stem borers and fall armyworm in most cases, but other insects and diseases can be just as important and may require spraying.

What are the nicking requirements for the available Insect protected and drought tolerant GM hybrids?

GM maize seed production has the same challenges as conventional maize seed production. Thus, nicking requirements will vary by hybrid and by environment.

Which laboratories can I use to test the TELA maize hybrid seed for trait purity?

AATF and partners have identified two labs in South Africa (University of Free State, Bloemfontein and SciCorp Lab, Pietermaritzburg) and one lab in Kenya (Biosciences east and central Africa – BecA) for trait purity test.

What is the cost of TELA maize hybrid trait purity test per sample?

Certified labs have varying costs for trait purity test. The exact cost will be obtained direct from the specific lab.

How does the cost of TELA Insect protected and drought tolerant GM maize hybrid seed production compare to conventional?

Results will vary just like for conventional maize seed production. It may cost less if the added insect protection in the *Bt* inbred reduces the number of pesticide sprays required and gives better seed yields. Trait purity tests that don't meet standards could result in significant cost increases depending on the quantity of seed that doesn't meet specifications and needs to be discarded.

What are the unique risks for insect protected and drought tolerant GM maize seed production?

The risks are the same for GM and conventional seed production – they require close monitoring and adherence to the steps in the process to avoid mistakes. A robust Quality Management System (QMS) should be used for all hybrid maize seed production. A few things that might be unique to GM maize seed is in some cases, the *Bt* gene can alter the way the inbred performs when compared to its conventional isolate (sometimes better, sometimes worse) so it's best to consider it like a new inbred even though one may be very familiar with the conventional version. The other main risk is the precision of the trait purity tests – unlike genetic purity tests for conventional hybrids that can often be subjective, the tests for trait purity are not ambiguous and any errors in detasseling or isolation will be evident in the test results.

Are seed regulations different for insect protected and drought tolerant GM maize?

There's no reason or need for new seed regulations with GM maize seed. The biosafety regulatory authorities' approval for commercial release means it is safe for use and not significantly different from conventional maize. Existing seed laws and regulations are all that is needed to manage both conventional and GM maize seed. If a country for some reason creates special seed regulatory processes for GM maize, the project will need to advise seed companies on the situation specific to that country.



TELA Maize Project

PROMOTION AND MARKETING

What brand(s) will the insect protected and drought tolerant GM TELA maize hybrids be sold under?

The primary brand farmers should see is the respective seed company brands. Seed companies should use their own variety designated name or number. The TELA® brand is intended as a secondary brand which helps communicate that the variety is insect protected and drought tolerant and that it came from the TELA Maize Project. The TELA® variety number and VIN number where applicable, should not be displayed prominently, it only needs to be displayed on the legally required seed label along with germination information and other such information required for the official (legal) seed label.

How can I get seed for trials for promotion of the new TELA maize hybrids?

Contact a TELA® Maize Project staff or representatives from African Agricultural Technology Foundation (AATF) to request demo seed for promotion purposes. However, not all hybrids may be available from the Project depending on many factors. Seed companies can request small quantities of inbred line seed to make up their own demo seed as well.

How much demo seed of TELA maize hybrids can I get and how much will it cost?

This depends on the quantity and availability of seed.

Why does the license necessitate that I use the TELA® brand?

It is very important for farmers to know and trust that they are getting insect protected and drought tolerant GM maize seed that is of top quality. The TELA® brand is a brand name that communicates consistently to farmers regardless of which seed brand is purchased. The brand communicates that TELA® maize is insect protected and drought tolerant GM maize, backed up

with certain quality standards. Thus, all companies selling TELA® maize seed must use the TELA® brand in marketing and promotion, for a consistent and credible communication to farmers about the technology.

What are the branding requirements for TELA Maize?

The primary brand farmers should see is the seed company brand using own variety designated name or number. The TELA® brand is to be used as a secondary brand which only helps communicate that the variety is insect protected and drought tolerant GM maize seed and came from the TELA Maize Project. The TELA® variety number should only be displayed on the legally required seed label information.

What help can I get from TELA Maize Project to support my promotion efforts for TELA maize hybrids?

TELA® and AATF representatives are available to help seed companies promote their brands. AATF can work with seed companies to develop a branding and marketing approach that fits specific market needs and allows business owners to distinguish their brand in the market. Though they may not have money to fund hybrid promotional activities for individual seed company brands, they can provide knowledge, expertise and advice that can help companies to develop effective hybrid promotional plans.



TELA Maize Project

STEWARDSHIP

Why are the quality standards so important for insect protected and drought tolerant GM maize seed like TELA maize?

Genetically Modified (GM) technology is new and different and when delivered in high quality seed can make a significant increase in farmers' productivity. Insect protected, and drought tolerant GM technology is also subject to regulation by government institutions. The image of the GM maize and the benefits it delivers sets new and higher expectations with farmers. It is, therefore, very important to establish high quality standards and to adhere to those standards to meet the expectations of a farmer who purchases the seed.

What's different about managing quality for insect protected and drought tolerant GM vs conventional seed?

Quality management for GM maize seed is, or should be, the same as for conventional maize seed. Quality is equally important for both types of seed. The main difference however, is for GM maize seed, there is a laboratory test that can accurately check for the trait purity, while the genetic purity test for conventional maize seed is generally not as accurate.

Whose responsibility is it to make sure that trait purity standard is met?

It is the responsibility of the seed company to test for trait purity as stipulated in the license contract with the trait licensor – African Agricultural Technology Foundation (AATF). The existing seed laws on genetic purity requirements do not need to be changed and are adequate to cover GM maize seed just as they cover conventional maize seed. Any issues related to trait purity are dealt with through contract law according to the terms of the agreement between the Seed Company and AATF.

What happens if the TELA maize trait purity doesn't meet standards?

In this case the same thing that should be done for conventional maize seed applies to GM maize seed. The trait purity standards, however, are defined in the licensing agreement and decisions would need to be made between the seed company and AATF, the Licensor.

What is a refuge and why is it important in TELA maize hybrid production?

Refuge is non-*Bt* maize planted near the *Bt* maize to ensure that sufficient susceptible insects come out of the refuge area to mate with, if any, resistant insects. When susceptible insects mate with resistant insects their offspring are susceptible. This strategy helps ensure that resistant populations of insects don't develop and, therefore, the value of the *Bt* maize to control insects is maintained. Since growing TELA maize involves control of insect pests, if used improperly insect pests can develop resistance to it thus reducing its effectiveness in improving productivity.

Why must we put the refuge seed in a bag within a bag instead of blending it?

Entomology experts have studied this question carefully and for the stem borers and fall armyworm found in Africa they've determined that because the insect larvae are highly mobile and move from plant to plant – a blended refuge would lead to more rapid development of resistant populations of stem borers and fall armyworm. If the refuge is kept separate but close to the *Bt* maize the resistant insects are less likely to develop.





What happens if farmers save their TELA maize seed for replanting?

This is the same for conventional hybrids and for GM maize hybrids. Because hybrid seed is the first-generation offspring from two distinct parents, it is uniform and has a unique characteristic known as hybrid vigor. It is possible to save the 'seed' (grain) from a hybrid to replant, but the crop won't be uniform, and it loses its vigor because the genes from the two original parents in the saved 'seed' (grain) start to segregate. Saving 'seed' from hybrid plants is possible and not prohibited, but it is also bad advice and practice because the 'seed' will yield substantially less. The conventional and the GM seed experience the same phenomenon, but with the *Bt* trait, it will be especially evident because 25% of the plants won't have a *Bt* gene to protect them against stem borer and/or fall armyworm.

What is the seed company's responsibility regarding the refuge?

Seed companies must make sure that all TELA® hybrids sold have refuge seed in a small bag within the GM maize seed bag. The refuge seed should be 5% of the total seed and it should be accompanied with instructions to the farmer to plant the refuge seed first and then the GM maize seed. Each seed company is responsible for producing or purchasing their own refuge seed that will fit with the GM maize hybrid they are selling. Seed companies are responsible for training their sales staff on the importance of the refuge and how to communicate effectively to farmers about it and help monitor compliance by the farmers to ensure they plant it. Reports to the licenser (AATF) are required on an annual basis to verify seed company compliance with the contract requirements regarding the refuge.



TELA
Maize Project



For More info:

Dr Sylvester Oikeh

S.Oikeh@aatf-africa.org

P.O. Box 30709 - 00100,

Nairobi, Kenya

Tel: +254-20 422 3700

Direct line: +254 (0)20 422 3753

Web: www.aatf-africa.org

