

The development of drought tolerant maize for Sub-Saharan Africa through the Water Efficient Maize for Africa (WEMA) project.

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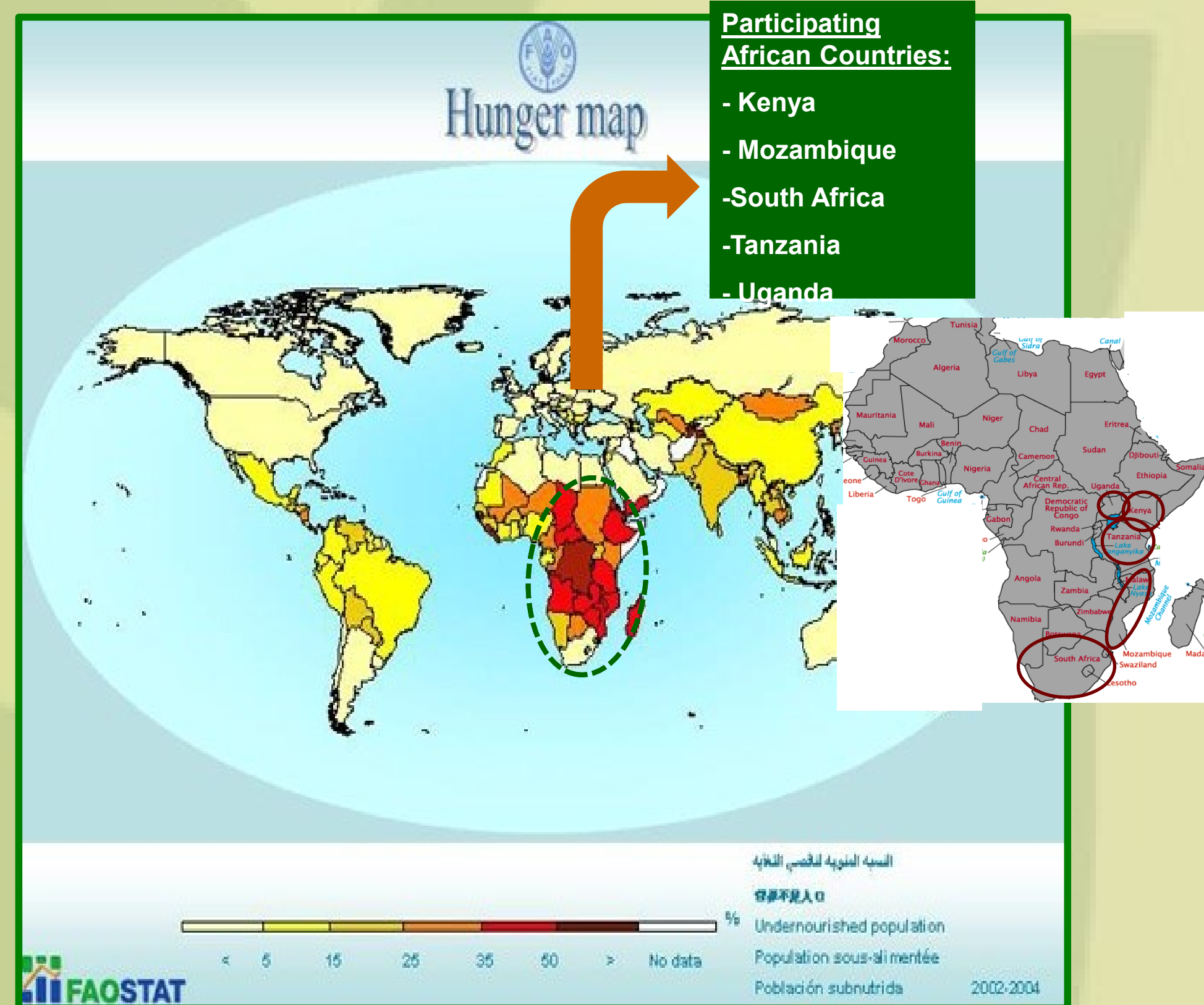
Abstract #54769

Abstract:

The African continent is prone to drought with three-quarters of the world's severe droughts having occurred over the past 10 years. Such frequent droughts make farming risky for the millions of smallholder farmers who rely on rainfall to water their crops. In the Sub-Saharan Africa region of the continent, maize is the primary grain crop grown for human consumption, with more than 300 million people dependent on it as their staple food. Unfortunately, maize is severely affected by the frequent droughts. The increasing environmental challenges caused by climate change will only worsen this problem. Hence, in response to a growing call by African farmers, leaders, and scientists to address the effects of drought in a way that is cost effective to African smallholder farmers, Monsanto joined the public-private partnership called the Water Efficient Maize for Africa (WEMA) project. This partnership is led by the African Agricultural Technology Foundation (AATF) based in Kenya with collaborating partners including CIMMYT and representatives from the National Agricultural Research Systems from participating countries, Kenya, Mozambique, South Africa, Tanzania, and Uganda. In this presentation we will discuss how Monsanto is contributing to this effort with the objective of developing drought-tolerant maize using the most advanced technology available internationally.

Introduction

- More than 300 million Africans depend on maize as their main food source – and it is severely affected by frequent drought.
- Drought leads to crop failure, hunger, and poverty.
- Climate change will only worsen the problem.
- Drought tolerance has been recognised as one of the most important targets of crop improvement programs, and
- Biotechnology has been identified as a powerful tool to achieve significant drought tolerance by the FAO.



To counteract these effects we are introducing our lead drought event MON87460 to increase yield from drought stressed African germplasm.

The MON87460 event codes for a cold shock protein (*cspB*) from *Bacillus subtilis* and has been shown to provide yield improvements under drought in US and South American trials.

Through the Water Efficient Maize for Africa (WEMA) project the partnership will provide drought tolerance technology through breeding and biotechnology to smallholder farmers in participating countries in Sub-Saharan Africa (SSA) region.

Objective

AATF is leading this public-private partnership called WEMA to develop drought-tolerant African maize.

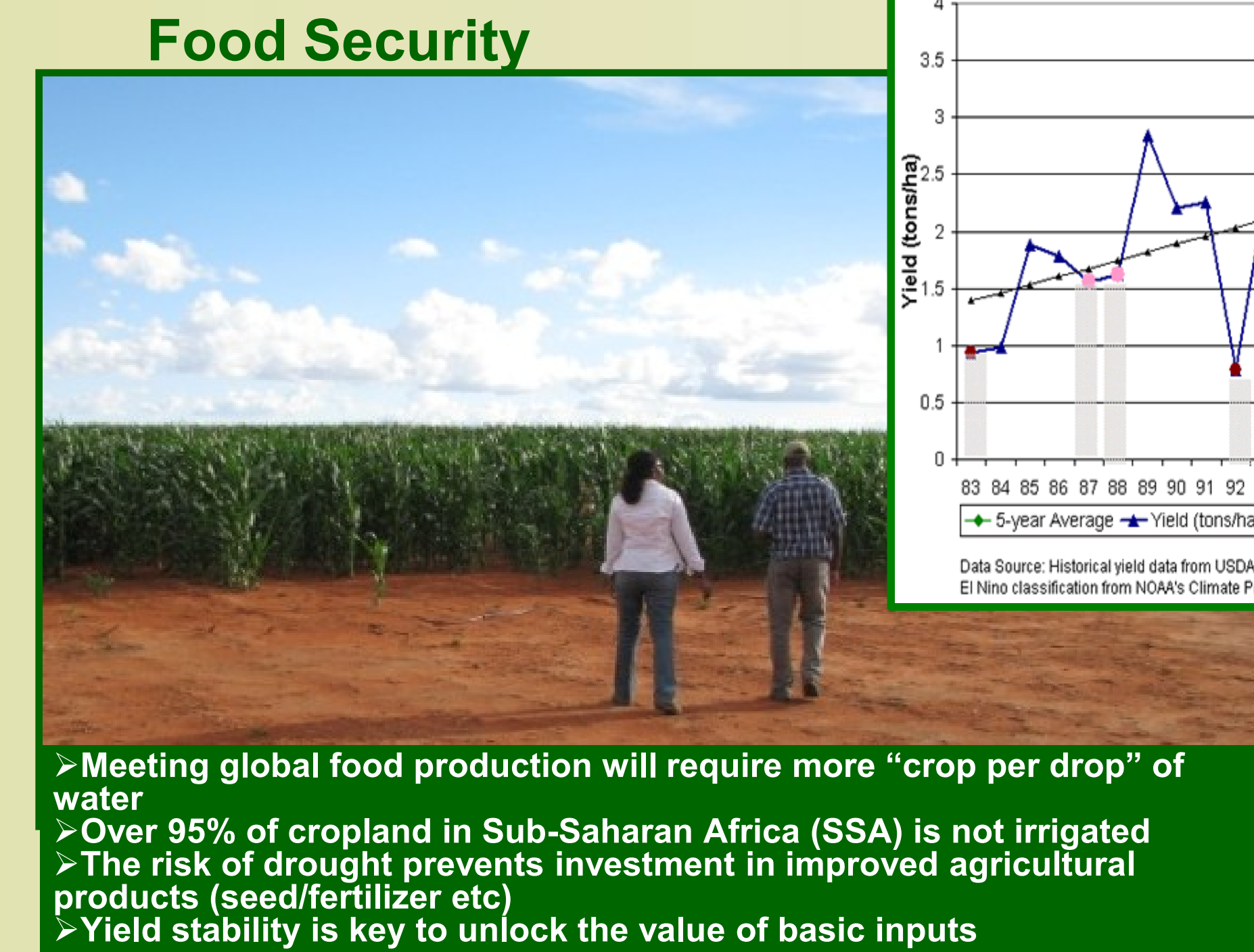
The long-term goal is to make drought-tolerant maize available royalty-free to small-scale farmers in Sub-Saharan Africa.

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| | Lead organization for project. Facilitate transfer of applicable technology to the African farmers. Will sublicense any deployed drought tolerance gene royalty free |
| | Largest breeding organization focused on SSA. 15+ years experience with controlled drought trials in Africa. Has extensive relationships network |
| | Monsanto will be responsible for developing germplasm, advanced breeding, integrating the gene and helping to establish the regulatory framework for the technology. |
| | NARS will be responsible for developing confined drought testing sites, driving the in-country regulatory process, and testing all WEMA products. |

The benefits and safety of the maize varieties will be assessed by national authorities according to the regulatory requirements in the partner countries: Kenya, Mozambique, Uganda, Tanzania, and South Africa.

Fund Provided by the Bill and Melinda Gates Foundation and the Howard G. Buffett Foundation; Approval Date: March 19th, 2008.

Importance of drought tolerance to Africa



Technology being used

To successfully deliver WEMA, it will take a strong Partnership of Technology Providers, hence the Partners combine three complementary approaches shown below.



Monsanto's Contribution to WEMA

Germplasm:

Drought tolerance germplasm from our global breeding programs. This will introduce novel sources of drought tolerance to African germplasm as well as increase germplasm diversity.

Markers:

Apply our marker aided breeding platform to both CIMMYT and Monsanto materials to develop new African hybrids that are higher yielding under moderate drought conditions. Additionally DNA markers for drought tolerance and disease resistance may be identified and will be available through CIMMYT for global public use.

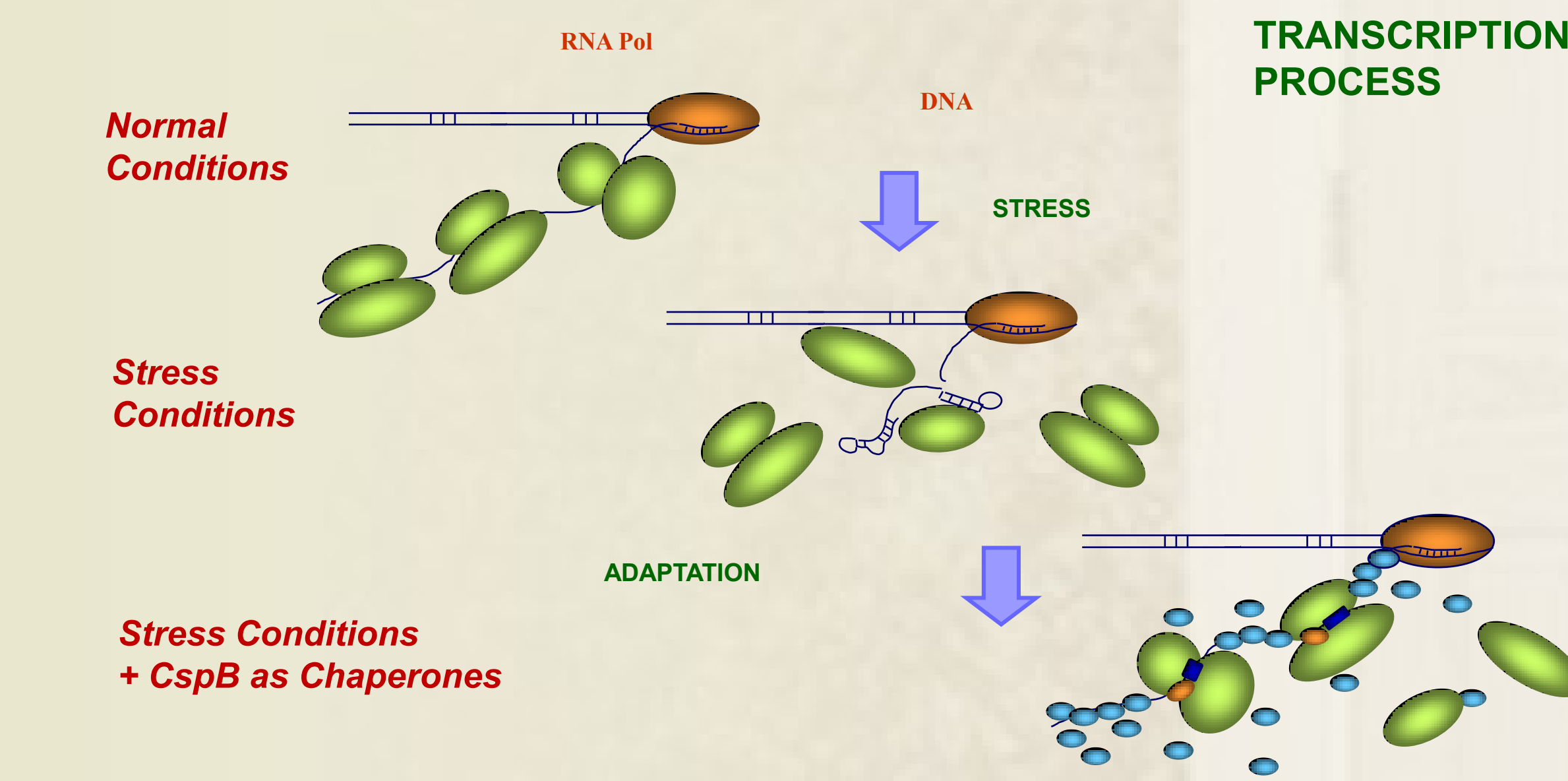
Biotech Traits:

Up to four commercial track drought tolerance events for testing in the partner countries to contribute additional levels of drought tolerance under moderate drought conditions beyond the improvements gained through molecular breeding.

Expertise:

We will provide expertise in molecular aided breeding, product development, biotech testing and stewardship.

Illustration of molecular mode of action of our current Biotech product being tested for drought tolerance in Africa i.e. MON87460 (*CspB*)



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