

Seed Production Technology for Africa

Modern and Pure Hybrids for African Farmers

Project brief



A researcher holds two plants to show the pollen-producing (left) and non-pollen producing plant (right) planted on a station in Embu, Kenya. Photo: H. De Groote/CIMMYT.

About SPTA - *The Seed Production Technology for Africa (SPTA) project aims to improve access to high-purity, modern maize hybrids, thus improving the livelihoods of resource-constrained maize farming households in sub-Saharan Africa. It seeks to deliver high-quality hybrid seed with improved yield in challenging environments such as low fertility environments, high heat stress, and low water availability, as well as in optimal conditions. SPTA is a collaborative initiative of the Agricultural Research Council of South Africa (ARC), International Maize and Wheat Improvement Center (CIMMYT), Corteva™ Agriscience, Kenya Agricultural and Livestock Research Organization (KALRO), and QualiBasic Seed Company (QBS). The initiative is supported by the Bill and Melinda Gates Foundation.*

Enhanced Hybrid Purity

The SPTA project utilizes a dominant non-pollen producing maize gene, Ms44, to create female parent plants that are unable to produce pollen and which do not need to be detasseled during hybrid seed production process. The process makes cross-pollination between the female and male parents more reliable, enabling efficient and cost-effective delivery of high purity hybrid seed.

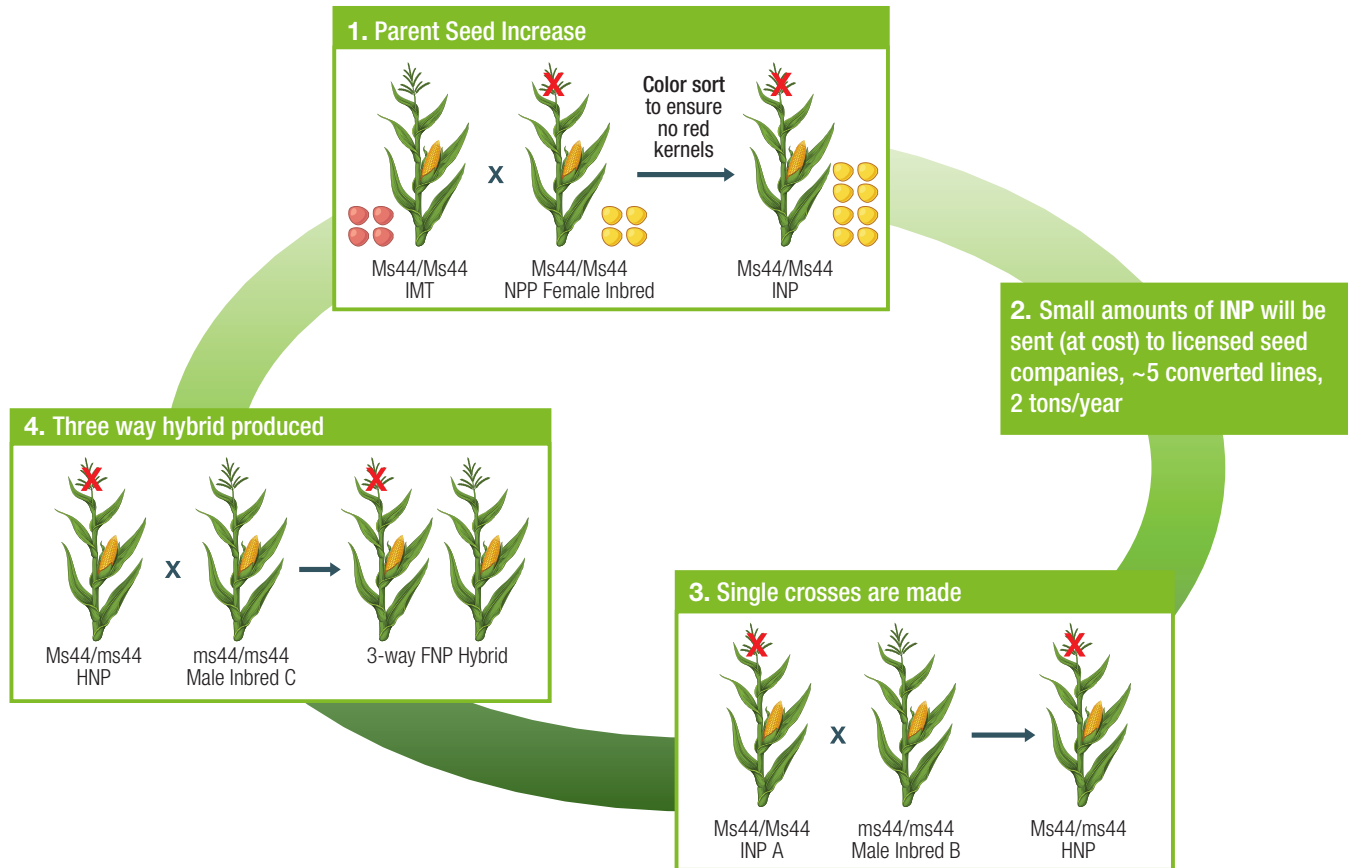
A unique feature of the SPTA process is the utilization of an Inbred Maintainer line (IMT) which contains a transgenic construct that has been designed not to transmit through the pollen. This specially designed construct, along with specialized state-of-the-art seed sorting technology, produces non-transgenic, homozygous Inbred Non-Pollen-producing seed (INP). This means the transgene is not present in the pre-basic or basic seed grown by partnering seed companies nor in the certified hybrid seed planted by farmers.

Hybrids for Low-Fertility Soils

SPTA-produced Ms44 hybrids grown by farmers will have an equal number of pollen-producing and non-pollen-producing plants. These hybrids are referred to as Fifty percent Non-Pollen producing (FNP). Since the pollen-producing plants provide more than adequate pollen for the entire maize field, the non-pollen producing plants are able to utilize energy more efficiently, which would otherwise be used for pollen production, to support greater grain production.

Comprehensive on-farm and on-station trials have been conducted to evaluate the value of FNP hybrids with and without fertilizer in Kenya, South Africa and Zimbabwe.

Seed Production Technology: A novel hybrid production system for Africa



Acronym	Pollen Production	Transgenic	Description
IMT	YES	YES	Inbred Maintainer
INP	NO	NO	Inbred NPP – (Pre-Basic)
HNP	NO	NO	Heterozygous NPP – (Basic)
FNP	50 percent	NO	50 percent NPP hybrid – (Commercial)

Hybrids used for research purposes are non-transgenic and were produced without the use of the Ms44 transgenic maintainer. The FNP hybrids demonstrate an approximate 200 kg/ha yield advantage across varying yield levels from 1 to 8 t/ha over 112 trial locations.

Targeted Countries

Research is currently ongoing in Kenya, South Africa and Zimbabwe. SPTA is engaging with stakeholders in Kenya and South Africa as initial intended beneficiary countries with plans to work with additional countries in the next project phase.

Funder

BILL & MELINDA
GATES foundation

Partners



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