

Seed Production Technology for Africa

Efficient Seed Production Process for SMEs in Africa



Women sorting maize seed at outside the Mgom'mera Seed Company warehouse in Lilongwe, Malawi.

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.

Need for High Quality Hybrid Seed

Poor seed cripples Africa's food security. A significant portion of African smallholders have limited access to affordable improved hybrid maize seed, due in part to challenges faced by seed production and delivery systems. Incomplete or improperly timed detasselling practices during certified seed production leads to loss of genetic purity, negatively impacting performance of hybrid seed in farmer fields.

Maize breeding creates hybrids with improved traits necessary for the local environment, including higher yield, disease resistance, and drought tolerance. Studies confirm that farmers prefer hybrids over comparable open pollinated varieties because they provide performance benefits. Assisting seed companies to more efficiently deliver higher quality seed products will benefit African maize smallholder farmers.

The Seed Production Technology for Africa (SPTA) will work with small and medium seed companies to strengthen their capacity to produce high quality hybrid maize seed in sufficient quantities at lower cost.

Opportunity to Strengthen the Seed Production Process

Seed production actors in Africa prevent self-fertilization by manual detasseling, a time-sensitive process which involves removing the pollen-producing tassels from the seed-bearing maize plants in the hybrid seed production fields. Detasseling is a labor-intensive and time-consuming process which, if not done well, can lead to self-pollination resulting in contamination of the hybrid product and reducing the final yield potential of commercial certified seed.

The SPTA process eliminates the need for detasseling by utilizing a naturally occurring maize gene – Ms44 – to create female parent plants which do not produce pollen and do not need to be detasseled. This eliminates the need to physically remove the pollen-producing tassels. Female parent plants are sown alongside an elite male parent line which produces pollen. Cross-pollination between the female and male parents is therefore more reliable and cost-effective, eliminating any self-pollination and improving the purity of hybrid seed.

With the Ms44 SPT system, the inbred line used as a seed parent to create single cross female seed also does not produce pollen and does not need to be detasseled during the production of basic seed. Finally, since the process of manual detasseling often removes one or more leaves in addition to the tassel, up to 10% female seed yield potential may be lost. With the Ms44 SPT system, the full seed yield potential of the production female line or single cross can be realized.

SPTA Benefits

Pre-basic seed required for use of the Ms44 SPT system will be made available at cost and the technology enabling the system will be accessed royalty-free by seed company partners producing seed for smallholders in sub-Saharan Africa.

Funder

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Partners



The primary benefits to seed companies serving African maize smallholders include:

- SPTA technology will prevent female self-fertilization at each production stage step to improve hybrid purity.
- It will reduce the need to detassel plants, cutting down seed production cost, and improving female seed yield.
- The SPTA technology fits well in the three-way hybrid production system used by most small and medium size seed companies in sub-Saharan Africa.



High Quality
HYBRID SEED
for seed companies
and smallholders



COST-EFFECTIVE
and efficient hybrid
seed production



NEW HYBRID
production platform
for more high-quality hybrids

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