CIMMYT Eastern Africa Maize Regional On-Station (Stage 4) and On-Farm (Stage 5) Trials

Results of the 2019 and 2020 Trials and Product Announcement

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Introduction

New and improved maize hybrids, developed by the CIMMYT Global Maize Program, are available for uptake by public and private sector partners, especially those interested in marketing or disseminating hybrid maize seed across eastern Africa and similar agro-ecological zones. NARS and seed companies are hereby invited to apply for licenses to pursue national release, scale-up seed production, and deliver these pre-commercial maize hybrids to the farming communities. Partners may make their selections based on the performance data generated through regional on-station and on-farm trials conducted by CIMMYT Global Maize Program. Product performance and other relevant information for the promising hybrids available for licensing are attached.

CIMMYT's Global Maize Program conducts annually Regional On-station (Stage 4) and Regional On-farm Trials (Stage 5) through a network of partners, including NARS and private seed companies, in eastern and southern Africa under various management and environmental conditions (trial site information attached as Appendix 5). Stage-gate advanced elite hybrids developed by the CIMMYT-Africa team, along with relevant benchmark commercial checks as well as CIMMYT internal genetic gain checks, are evaluated in these trials.

The **objectives of these trials are**:

1. To identify improved maize hybrids with higher yield, stress resilience, and agronomic performance, based on the must-have and nice-to-have traits included in specific product profiles;

2. To provide data to support varietal nomination under National Performance Trials (NPTs), variety registration/release of new improved hybrids from CIMMYT at the country level;

3. To help partners replace outdated, less productive, less resilient and/or less profitable commercial varieties in the target market segment with improved genetics; and

4. To monitor breeding progress and enhance genetic gains in maize breeding.

In order to be considered during the first round of product allocations and licensing, interested institutions are requested to submit a letter of interest along with duly-filled application (Form A and Form B) by **9 February 2021** by email to **GMP-CIMMYT@cgiar.org**, with attention to **Dr B.M. Prasanna**, Director, Global Maize Program, CIMMYT, and **Nicholas Davis**, Program Manager, Global Maize Program, CIMMYT. Any applications received after that deadline will be considered during subsequent rounds.

2020 Available CIMMYT Hybrids for Licensing to Partners

Following a rigorous trialing and a stage-gate advancement process culminating in the 2020 Eastern Africa Regional On-Farm Trials, CIMMYT, together with national partners in eastern Africa, has advanced a total of five (5) new elite maize hybrids that are now available for allocation/licensing to partners, as outlined in the following table.

Product Profile	**Newly available CIMMYT hybrids**	***Basic traits***	***Nice-to-have / Emerging traits***	***Trial summary***
Eastern Africa Product Profile 1A (EA-PP1A)	CIM19EAPP1A-17	Intermediate-maturing, white, high yielding, drought tolerant, NUE, and resistant to GLS, TLB, Ear rots, and MSV	MLN, Striga, FAW	Appendix 2
Eastern Africa Product Profile 1B (EA-PP1B)	CIM19EAPP1B-05	Early-maturing, white, high-yielding, drought tolerant, NUE, resistant to MLN, MSV, TLB	FAW, Striga	Appendix 3
	CIM19EAPP1B-10			
	CIM19EAPP1B-17			
Eastern Africa Product Profile 2 (EA-PP2)	CIM19EAPP2-31	Late-maturing, white, high-yielding, Drought tolerance, NUE, and resistant to GLS, TLB, MSV Ear Rots, and rust	FAW, MLN, Striga	Appendix 4

The data on grain yield and other relevant traits of entries across contrasting environments in eastern Africa, and the performance of selected CIMMYT maize hybrids available for licensing to the partners, is presented in **Appendices 2-5**.

Interested NARS and seed companies are hereby invited to apply for permission to pursue registration and commercialize selected maize hybrids from the available list of CIMMYT hybrids. In order to be considered during the first round of product licensing, kindly submit duly-filled application (Form A and Form B) by **9 February 2021** by email to **GMP-CIMMYT@cgiar.org**, with attention to **Dr B.M. Prasanna**, Director, Global Maize Program, CIMMYT, and **Nicholas Davis**, Program Manager, Global Maize Program, CIMMYT. CIMMYT Maize Product Allocation Committee will review the applications received by the due date and will take decisions on allocation of specific products based on clear criteria designed to promote equitable support to our valued partners (see **Appendix 1**). Any applications received after the 9 Feb deadline will still be accepted, but will only be considered during subsequent rounds of product allocation.

Once CIMMYT finalizes its allocation decisions, applicants considered during the first round of allocations will be notified as to the success or otherwise of their applications by **26 February 2021**. CIMMYT will maintain absolute confidentiality of commercially sensitive information (e.g., pedigree of an allocated hybrid) for all the allocation decisions and related data. Successful applicants will be expected to demonstrate to CIMMYT the path of their commercialization efforts within reasonable timeframe, and are expected to sign an agreement to that effect.

Further information regarding the product allocation process is given in **Appendix 1** below. For any further clarifications in this regard, please do not hesitate to contact any of the following contact persons in CIMMYT:

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APPENDIX 1: ACQUISITION AND USE OF CIMMYT MAIZE HYBRIDS FOR COMMERCIALIZATION

The principle purpose of CIMMYT's Germplasm development work is to provide improved, adapted and stress-tolerant varieties with particular benefit to resource-poor farmers. CIMMYT has produced both open-pollinated varieties (OPVs) and hybrids of maize suited to various agro-ecological zones. Furthermore, there are varieties with specific traits, such as Quality Protein Maize and Pro-vitamin A maize. Institutions (both public and private) may apply for permission to register CIMMYT varieties in specified countries within the framework of the applicable laws, rules and regulations of those countries, harmonized regional seed laws, the Multilateral System of the Food and Agriculture Organization's International Treaty on Plant Genetic Resources for Food and Agriculture, the Standard Material Transfer Agreement (SMTA), CIMMYT and CGIAR guidelines and policies, and the CIMMYT Maize Hybrid Registration and Commercialization Licensing Agreement. In granting permission to an institute to register CIMMYT-derived pre-commercial hybrids as varieties, CIMMYT retains all legal rights which it currently has in such varieties, including parental lines, and since CIMMYT Germplasm is an International Public Good, the partner institution may not acquire any ownership interest in the varieties or parental lines. In many instances, seed of CIMMYT varieties, and their parents, is already in the possession of parties other than the institution to which permission is granted, and therefore such varieties may continue to be used for testing and research purposes, or commercialization in other countries.

The approach used by CIMMYT in granting permission to Institutions to register CIMMYT maize varieties differs depending on whether the variety is an OPV or hybrid. Here, the process for hybrids is described. By nature, hybrids are uniquely defined by their parental combination, are more difficult to produce than OPVs, and the grain from hybrids will be less productive than their parents and should therefore not be planted as seed. Consequently, permission to register hybrids is granted to particular institutions on a confidential basis. The institution becomes the maintainer of the hybrid variety, and may give the hybrid a unique name, although a CIMMYT-generated Varietal Identification Number (VIN) will be assigned to each hybrid and this will need to be included on each bag/package of certified seed intended for commercial sale. The institution is not otherwise obligated to publicly reveal the source of the variety nor provide parental seed to other interested parties.

Allocation Process for CIMMYT's Elite Pre-commercial Hybrids to Interested Institutions

Institutions that are interested in registering CIMMYT elite products (pre-commercial maize hybrids or OPVs) may request permission to register varieties of their choice, by submitting duly-filled application (Form A and Form B) by email to **GMP-CIMMYT@cgiar.org**, with attention to **Dr. B.M. Prasanna**, Director, Global Maize Program, CIMMYT, and **Nicholas Davis**, Program Manager, Global Maize Program, CIMMYT. If more than one partner is interested in registering a particular product in a given geography, CIMMYT reserves the right to allocate the variety to only one partner based on an evaluation of the following criteria:

1. Investment by the applicant in variety testing and seed production.

2. Likelihood that seed will become widely available to smallholder farmers.
3. Likelihood that seed will become widely available as soon as possible.
4. Diversity among suppliers of improved seed.
5. Diversity of regions where the variety will be marketed.
6. Track record of the applicant as a CIMMYT collaborator (including the applicant's progress in commercializing any previously licensed CIMMYT products).
7. Relative importance of a variety for the variety portfolio or success of an applicant.

Once the CIMMYT Product Allocation Committee has reviewed and approved the allocation of a particular product to an applicant, CIMMYT will forward a CIMMYT Maize Hybrid Registration & Commercialization License Agreement for signature by the applicant. Upon signature by both parties, the licensee (partner institution) will need to submit a formal seed request. CIMMYT will provide small quantities of breeders' seed of the hybrid (and its parents, where appropriate) to enable the institution to begin testing and multiplication of the product (see Table 1, below). The partner institution will need to submit advance payment for any applicable shipping costs. Seed may not be immediately available in sufficient quantities for immediate shipment, in which case it may take up to one growing season, or up to two growing seasons in case applicable phytosanitary regulations require a quarantine period. Upon receipt of the seed, the licensee will be responsible for further testing, registration and commercialization of the allocated product in the target geographies for which the product has been allocated.

Table 1: Details of Seed supply for licensed CIMMYT hybrids

Class of Seed	Upon allocation	Any additional seed material requested
Breeder's seed		
Inbred parent	Up to 1 kg of each Parent line at no cost for seed.	For each additional kg up to 10kg maximum (beyond the 1 kg of free seed), cost recovery fee is US $7/kg (plus shipping costs, if any).
Single-cross female	It is the partner's responsibility to produce single-cross female parent seed; CIMMYT does not provide.	
Basic Seed		
Inbred parent	It is the partner's responsibility to produce basic seed; CIMMYT does not provide.	
Single-cross female		
Hybrid seed		
NPT	Up to 4 kg of each entry at no cost for seed.	For each additional kg up to 10kg maximum (beyond the 4 kg of free seed), cost recovery fee is US $7/kg (plus shipping costs, if any). At least one growing season advance notice is required.
Demo	Up to 4 kg, upon request at no cost for seed.	For each additional kg up to 10kg maximum (beyond the 4 kg of free seed), cost recovery fee is US $7/kg (plus shipping costs, if any).

NB: Quantities are subject to availability. At least one growing season advance notice is required, or two seasons in case applicable phytosanitary regulations require a quarantine period. The recipient is responsible for any costs for or related to seed shipment or processing. Indicated cost recovery rates are subject to periodic revision.

What does the CIMMYT Maize Hybrid Registration and Commercialization License Agreement entail?

The standard CIMMYT Maize Hybrid Registration and Commercialization License Agreement establishes the terms and conditions under which CIMMYT grants permission to our partners to pursue registration/release and eventual commercialization of our maize hybrid products within a specific country or group of countries. CIMMYT does not charge royalties or licensing fees under the standard License Agreement; all we ask in return is that our partners make sincere efforts towards commercializing these hybrids and provide CIMMYT with information that we can take back to our donors to demonstrate that their investments are creating real impact for resource-poor farmers who otherwise would have no access to our improved maize products.

What rights does the agreement grant to CIMMYT partners?

- The agreement gives the CIMMYT partner exclusive permission to produce (or have produced) the parental lines and hybrid seed and to register and commercialize (or to have another person commercialize) the hybrid(s) only in the specific countries identified in the agreement.
- Partners may not register or commercialize (nor provide sublicenses to organizations for registering or commercializing these hybrids), in any country outside of the specific countries listed in the agreement.
- Public institutions may collect a reasonable royalty from their sublicensee(s), but private (including parastatal) companies may not. CIMMYT must be informed of any sublicenses.
- CIMMYT will not knowingly give similar licenses to anyone else in the same specified countries as long as the agreement remains valid.
- CIMMYT treats the pedigrees of the licensed hybrids as confidential information, and only provides this information to other licensed partners, including any other partner who may have similar licenses for registration and commercialization in other countries (different from the ones in any other given partner's agreement).
- CIMMYT will provide limited amounts of the breeder seed and hybrid seed, but some costs may apply (see Table 1).
- Partners have the option of ending the agreement with six (6) months' prior written notice to CIMMYT. So if for example a partner is unable to register and/or commercialize one or more of the CIMMYT hybrid(s), they may simply terminate or amend the agreement with respect to any such hybrid(s).
- Partners owe CIMMYT no royalties on the commercialization proceeds, but are invited to make a voluntary contributions to support CIMMYT's R&D programs.
- Partners may also use the parental line and hybrid seed for their own research, breeding and training purposes, and may develop new germplasm from any of it. Partners will own

such newly derived germplasm, but obligations of the SMTA continue to apply to any germplasm derived from that transferred under the SMTA.

What are the Partner's responsibilities and obligations?

- Once CIMMYT has provided the initial breeder seed, it is the partners' responsibility to produce (multiply) and maintain their own stock of certified seed of the parental lines for producing the hybrids. If the partner is unable to produce sufficient certified seed of the parental lines, they may contract with one or more third-party seed producers to have it produced on their behalf.
- Licensees are responsible for maintaining the genetic purity of the parental lines.
- Licensees are required to submit annual reports demonstrating that they are making efforts in good faith to try and register and commercialize their licensed hybrids within a reasonable timeframe. The content and format of those reports will be determined by CIMMYT.
- Partners must keep confidential all information that CIMMYT specifies as confidential information, including among other things the pedigree for the CIMMYT hybrid(s) licensed under the agreement and the specified countries in which the partner has been given license.
- If a partner or CIMMYT terminates the agreement for any reason, their obligations to keep the pedigree of the CIMMYT hybrid(s) confidential continue for 10 years after the expiration or ending of this agreement.
- Partners may not give or transfer any parental line seed to any other person or organization, with the exception of any seed producers whom they have contracted for assistance with seed production.
- If a partner uses one or more of the parental lines to develop new germplasm, they will own that new germplasm, but because it incorporates genetic material from the seed CIMMYT will have transferred under an SMTA, when transferring the new germplasm to any other person or institution for research, breeding or training, it must be under a new SMTA.[1] Other SMTA obligations continue if a partner or others commercialize germplasm created from the original germplasm transferred under the SMTA.

What are CIMMYT's rights?

- CIMMYT retains ownership rights to the parental lines and hybrids.
- CIMMYT may give (or may have already given) similar licenses to register and commercialize the same hybrids to different partners in other countries outside of the

[1] Partners can create a new SMTA, available in six languages (Arabic, Chinese, English, French, Russian and Spanish), at this website: https://mls.planttreaty.org/itt/index.php?r=site/index&lang=en

specified country(ies) listed in any other given partner's agreement. The other partners are bound to the same confidentiality rules and other obligations.

- CIMMYT may make, use and distribute to others (i) the parental lines and (ii) the CIMMYT hybrid(s) licensed to a partner for research, breeding and training purposes only in any country.
- As a member of the CGIAR System Organization, CIMMYT has annual reporting obligations that may require disclosure of certain confidential information relating to licensees. This confidential information is not further disclosed.
- CIMMYT may use information we gather from licensees to develop reports and communications materials that reveal in aggregate (without revealing confidential information) the impact of our work.
- If CIMMYT believes that a partner is not acting with diligence to commercialize their licensed hybrids, CIMMYT may terminate the agreement and re-allocate the same hybrid(s) to one or more other partners in the specified country/ies. This outcome could also negatively affect that organization's prospects for receiving licenses from CIMMYT in the future.
- Once the agreement ends, CIMMYT may re-allocate the CIMMYT hybrid(s) to another institution for commercialization in the same specified country.

How does CIMMYT's IMPROVED MAIZE get to the farmer?

CIMMYT
International Maize and Wheat Improvement Center

Other sources of data on varietal adoption figures and impact (e.g., mobile platforms).

Impact assessment studies at the household and country levels.

Feedback from partners on varietal adoption, certified seed production and impact.

Client preferences and CIMMYT's comparative advantages inform breeding targets.

1 PRODUCT DEVELOPMENT

Breeding funnel
Stage 1
Stage 2
Stage 3

CIMMYT breeders advance the most promising hybrid combinations from one stage to the next.

Assessment on farmer preferences and preferred traits.

Regional on-station trials

Materials from across CIMMYT projects are evaluated on a regional basis (ESA, Asia, LatAm) under controlled conditions at research stations.

CIMMYT organizes field days with partners

Regional on-farm trials

Performance of CIMMYT materials is measured against that of 3-5 competitive commercial varieties in farmer-managed conditions.

Product Advancement Meetings

Regional teams of CIMMYT breeders and seed systems specialists meet to identify the most promising hybrids for their region (ESA, Asia, LatAm).

2 PRODUCT ALLOCATION

Product announcement

List of new, most promising hybrids published with their performance data on CIMMYT webpage

Requests for products

Public and private-sector partners submit formal applications for rights to release CIMMYT maize products within specified geographies.

Review of applications

Regional PACs meet 3-4 times per year to review applications and make decisions on allocation of specific products to specific partners within specific geographies. PACs make their decisions based on a set of criteria that seek to balance the principle of equity among partners and partners' potential for achieving impact.

Allocation to partners

Successful applicants receive licenses from CIMMYT to register specific CIMMYT maize hybrids as their own products within specific countries. CIMMYT charges no royalties, but monitors the follow-through on commercialization commitments.

3 RELEASE & COMMERCIALIZATION

National Performance Trials

Each country has its own process and criteria for seed companies to register new products, usually involving a series of National Performance Trials.

CIMMYT provides technical backstopping with DUS/VCU information.

Varietal release & registration

Products that successfully perform in the NPTs are officially licensed/registered by national authorities in each country.

Seed scale-up

Partners produce and market seed to farmers, using varietal demonstrations and other techniques to stimulate demand.

CIMMYT helps supply early generation seed supply

CIMMYT helps companies develop "Seed Road Maps" to guide their scale-up efforts

CIMMYT provides consultation to partners on seed production and business management

Adoption by farmers

Legend of acronyms

CIMMYT: International Maize and Wheat Improvement Center
DUS/VCU: Distinctness, Uniformity and Stability/Value for Cultivation and Use
ESA: Eastern and southern Africa
LatAm: Latin America
NPT: National Performance Trials
OPV: Open Pollinated Variety
PAC: Product Allocation Committee