



FEED THE FUTURE

The U.S. Government's Global Hunger and Food Security Initiative

Feed the Future Public-Private Partnership Technical Forum DISCUSSION PAPER: SEED TECHNOLOGY

Session Purpose: *The U.S. Government views hybrid and genetically engineered seeds as important tools for addressing current and future global food security challenges, but also recognizes that countries have the option to choose which technologies to adopt. Science-based information about seeds and seed systems is in some cases lacking, undermining a country's ability to make evidence-based decisions. This session will focus on how to provide such information and support local evaluation capacity for decision-makers in Feed the Future countries, especially in Africa.*

Session Deliverable: *Identify potential public-private partnership mechanisms to support information sharing, local evaluation capacity, and distribution systems for new seed technologies.*

Context/Rationale:

While not silver bullets, investment in science-based technologies like genetic engineering (GE) and hybrid technologies are important tools for addressing current and future global food security challenges. For countries that are interested in using these technologies, there is a great deal of potential to increase agricultural production, reduce crop loss due to insects and disease, and make local sourcing of products more viable. USDA, USAID, and State have existing activities and resources to support evaluation, delivery and use of GE and hybrids, including capacity building, scientist exchanges, outreach/communications activities, technical support to regulators, and development of new crop varieties. Private industry also has existing programs, including outreach activities through CropLife International, information exchange through local dealers, and GE research projects such as the Water Efficient Maize for Africa (WEMA) project and the Improved Maize for African Soils (IMAS) project.

Potential Partnership Focus Areas:

Potential Countries for GE utilization: The region with the most potential to utilize GE through more formalized cooperation is likely East Africa. This region encompasses IMAS target countries (Kenya, S. Africa), WEMA countries (Mozambique, Tanzania, Uganda, S. Africa and Kenya), USDA and USAID cooperative programs working with the Common Market for Eastern and Southern Africa (COMESA) to build a regional regulatory system, USAID bilateral activities providing regulatory support (in Uganda, Kenya, Malawi, possibly Tanzania), and other crop development projects (e.g. GE banana, cassava, sweet potato). The Department of State is also exploring engagement with Ghana, Kenya, Malawi, Mozambique, Nigeria, Tanzania, and Uganda in FY 2012.

Uganda is one of the East African leaders in biotechnology with many technologies in the pipeline (such as virus-resistant cassava, biofortified banana, and Bt Cotton) and has significant capacity in its National Agricultural Research Organization (NARO) along with growing political support. Kenya has recently approved its implementing regulations for GE cultivation/import; however, significant challenges are still anticipated as new technologies that can benefit small holders move through the nascent system. Tanzania has comparatively fewer research activities; however, maize is a focus value chain under the Feed the Future program. Cooperation in Tanzania will be needed to strengthen the evaluation and

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knowledge base regarding GE if Tanzanian producers are to consider knowledgeably the potential benefits of biotech maize production.

Potential Countries for Hybrid Utilization: Farmers in some African countries have difficulty accessing quality hybrid seed. Cost is one issue that limits purchase of hybrids. However, often, farmers are distrustful of local seed suppliers and have no way of verifying that seed for sale is viable and a high quality hybrid. Public/private partnerships could be very helpful in ensuring that local farmers are able to obtain viable, high quality corn hybrids that they desire to grow. East Africa makes sense as an area of focus to increase hybrid utilization because (1) many of the Feed the Future programs in the region have identified maize as one of their focus value chains (Kenya, Uganda, Tanzania, Rwanda, Ethiopia and Zambia) and (2) maize is an area where the private sector has significant value to bring in the form of hybrids. As experience in Malawi has shown, countries not prepared to use GE technologies can still see tremendous benefits in using modern hybrids.

Example Projects:

- ***Mentorships:*** A challenge for African public-sector partners involved in developing new varieties through GE is the practical knowledge of what is needed to move a variety from the lab to commercial availability. This is an area where private-sector plant biotech companies excel and could act as mentors and consultants to these African public-sector product developers. While this is likely already happening in projects such as IMAS and WEMA, this mentorship is needed in other initiatives being undertaken by NGO's, NARS, CGIAR, and universities. Counsel could be offered on a variety of topics, such as good practices in conducting confined field trials, techniques to evaluate varietal performance, preparing solid regulatory packages, how to deliver effective communication messages, and product lifecycle stewardship. This could be done in either a formal or informal method, depending on the way in which partners want to engage.
- ***Product Developer Exchanges:*** Along the lines of mentorship, more formalized programs of "product developer" exchanges (3-6 months) with private-sector companies would not only give product developers better exposure to the real life process, but also likely create a network of people who are more knowledgeable about GE and hybrids. One possibility would be to explore how these exchanges could be fit into both new and existing U.S. Government capacity development and fellowship programs.
- ***Enabling technology through policy:*** An area that constantly requires attention is feedback to host country governments on the implications of draft laws (biosafety, varietal registration, input policies, etc). While this is already happening, it continues to be a valuable way in which policy makers can understand either the positive or negative effects of a policy on private investment and the public good, and should be continued under any private sector/U.S. Government cooperation.
- ***Faculty Exchanges:*** Private-sector representatives could give university short courses in developing countries on key emerging technologies, e.g., GE seeds and hybrids.

Current Efforts:

In Uganda, significant political will and commitment exists from high-level officials to commercialize GE products; however, legislation to facilitate the introduction of these new technologies has yet to be approved. While the USAID-supported Program for Biosafety Systems (PBS) has been providing technical capacity-building to policy makers at the request of the Ugandan government, continued effort

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is needed to mobilize and engage on this issue. Groups like the Uganda Biotechnology and Biosafety Consortium (UBBC) will need to drive the implementation of science-based legislation.

The situation in Kenya has been well documented recently in the media, especially regarding food aid containing products derived from biotechnology. As the Kenyans implement their new biosafety law, support will be needed to address both the processes and more complicated issues, such as stacked traits and continued low-level presence issues. There are strong voices on both sides of these issues. Kenya has most recently been a primary African focus country for anti-GE activism.

In Tanzania, liability clauses embedded in the 2009 Environmental Management (Biosafety) Regulation have prohibited product developers from actively moving forward on research activities. However, there may be interest in repealing some of these clauses.

Key Questions for Discussion

- What countries in East Africa are best positioned today to take advantage of available seed improvement technologies like hybrid and GE seeds?
- What is the appropriate role of the private sector in supporting evaluation and utilization of GE and hybrid technologies while mitigating possible conflicts of interest?
- How can the U.S. government leverage private-sector efforts and how can the private sector leverage U.S. government efforts for new technology?
- What are reasonable entry points for the U.S. government to assist private-sector seed dealers in supporting utilization of improved seeds?
- What role might other actors along the value chain have?
- How might U.S. government programs and the private sector support the distribution of science-based information to farmer organizations on the basics of hybrid and biotech seed?

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APPENDIX

Illustrative Current Investments

<i>Purpose/Brief description</i>	<i>Organization (and partners when applicable)</i>	<i>Amount (1,000's)</i>	<i>Year(s)</i>	<i>Point of Contact</i>
Technical support to host country regulators, policy makers on biosafety. In E. Africa, currently active in Kenya, Uganda and Malawi. Also works with COMESA on facilitating adoption of a regional biosafety policy.	International Food Policy Research Institute	~\$3M per year for all programs	FY03-FY13	John McMurdy
Developing transgenic insect-resistant cowpea and transgenic abiotic stress-tolerant rice. Rice project is active in Uganda while cowpea project is only W. Africa.	African Agricultural Technology Foundation	~\$2.5M per year combined	FY04-FY14	Larry Beach
Smaller effort to develop transgenic banana, sweet potato, and potato varieties in Uganda and Kenya.	CGIAR Centers	~\$250K per year for each crop	no grant expiration	Eric Witte/John McMurdy
Developing transgenic cassava in Uganda, Kenya.	Danforth Plant Science Center	~\$500K per year	FY09-FY14	Larry Beach
Developing water efficient maize (conventional/GE) in Kenya, Uganda, Mozambique, Tanzania and S. Africa.	Monsanto/AATF			
Developing nitrogen-use-efficient maize (conventional/GE).	Pioneer	--	Ongoing	Jane Bachmann
African Biofortified Sorghum – developing sorghum varieties with increased micronutrient content through GE.	Pioneer/Africa Harvest	--	Ongoing	Lonetta Ragland
Borlaug/Cochran Fellows Programs: Short-term USDA exchange programs focused on policy makers/researchers (Borlaug) and agribusiness (Cochran) in cooperation with U.S. institutions	USDA	Varies each year	Ongoing	USDA/OCBD
Building regional biosafety framework: Engaging with COMESA, focusing on capacity-building projects to foster science-based regulatory frameworks, supporting technology adoption, facilitating information sharing, strengthening both scientific community and COMESA member states to engage in relevant international discussions.	USDA/PBS	\$1.4M	FY12-14	Zhulieta Willbrand