



Highlights of 2010

Drought-tolerant maize for Africa: Better food security and livelihoods

Four years on: are we succeeding?

In 2010, the DTMA project was in its fourth year and this was a critical time for the project teams as they reviewed progress made and strove towards achieving the overall project vision of success: "Over 10 years, to reach 30-40 million people with improved drought tolerant maize varieties that yield 1 t/ha more under drought and give 20-30% more yields in farmers' fields". So far strides have been made in variety development, release and adoption; seed production; capacity building and training; and communication and advocacy. These Annual Highlights will give details of selected project achievements so far and specific ones for 2010.

Updates on DT maize variety development and release

As of September 2010, 60 DT maize varieties have been officially released and are being marketed in the 13 project countries; with 74 more in the variety release pipeline (see Tables 1 and 2). This has been achieved through technical collaboration between the project, national agricultural research and extension systems,

and seed companies, in aspects of: germplasm development, expansion of drought screening sites, variety testing, training of breeders and technicians, and backstopping for variety release. To date, 29,283 hybrids and 927 OPVs have been evaluated under drought, with the project supporting more than 26 national agricultural research system breeding programs.

Category	Type	AO	ET	KE	MW	MZ	TZ	UG	ZM	ZW	Total
Registered & in Production	OPV	1	1	4	3	0	3	0	2	5	19
	Hybrid	0	0	2	3	0	1	1	4	3	14
In Release Process	OPV	1	0	0	0	2	4	0	2	3	12
	Hybrid	0	0	0	0	3	14	0	3	7	27

Table 1: DT maize varieties released and in progress (September 2010) in eastern and southern Africa (AO-ZW= Angola, Ethiopia, Kenya, Malawi, Mozambique, Tanzania, Uganda, Zambia and Zimbabwe)

Category	Type	BN	GH	ML	NG	Total
Registered & in Production	OPV	8	5	2	7	22
	Hybrid	0	1	0	4	5
In Release Process	OPV	7	6	6	7	26
	Hybrid	2	2	2	3	9

Table 2: DT maize varieties released and in progress (September 2010) in West Africa (BN-NG= Benin, Ghana, Mali and Nigeria)

The Drought Tolerant Maize for Africa (DTMA) Project is jointly implemented by CIMMYT and the IITA, and is funded by the Bill & Melinda Gates Foundation and the Howard G. Buffett Foundation. The project is part of a broad partnership, involving national agricultural research and extension systems, seed companies, non-governmental organizations (NGOs), community-based organizations (CBOs), and advanced research institutes, known as the Drought Tolerant Maize for Africa (DTMA) Initiative. Its activities build on longer-term support by other donors, including the Swiss Agency for Development and Cooperation (SDC), the German Federal Ministry for Economic Cooperation and Development (BMZ), the International Fund for Agricultural Development (IFAD), the United States Agency for International Development (USAID), and the Eiselen Foundation. The project aims to develop and disseminate drought tolerant, high-yielding, locally-adapted maize.

While this is encouraging, more progress will be made through shortening the time for variety release and the harmonization of regional seed regulations and laws for promoting testing, release and marketing of seed of new varieties across borders. Other efforts such as developing the local grain markets will encourage farmers to adopt new DT maize varieties, as farmers will be assured of a market for their produce. In the coming year, the DTMA project will continue working with governments, partners and other stakeholders such as non-governmental and community-based organizations in the project countries towards realization of this goal.

Ghana releases four new DT maize varieties

On 15 March 2010, four new drought tolerant quality protein maize varieties were officially released in Ghana. The varieties were collaboratively developed by the International Institute of Tropical Agriculture (IITA) and Ghana's Council for Scientific and Industrial Research (CSIR)-Crops Research Institute (CRI) and the Savanna Agricultural Research Institute (SARI). Manfred Ewool, maize breeder from CRI led the CSIR team. Ghanaian farmers have welcomed these new varieties which are expected to boost maize production and have even given them local names – denoting their importance in Ghanaian society and based on their characteristics. They are CSIR-Omankwa ('gives life'), CSIR-Aburohema ('Queen mother of maize'), CSIR-Abontem ('extra early maize') and CSIR-Enii Pibi ('father's child'). Says Ewool, "The extra early DT varieties will help bridge the 'hunger gap' during the planting season. Farmers could plant early, harvest and sell or use it as food before the main season begins." On average they harvest between 1.5 and 2 tons/ha, and when drought hits this drops to 0.5 tons/ha, especially where local varieties are planted. With the new DT maize varieties released, farmers could harvest between 1 and 2 tons/ha under drought. The yellow DT variety – CSIR-Abontem – would contribute to national savings of US\$ 1.8 million annually spent on importing yellow maize for the poultry industry.



CSIR-Omankwa ('gives life')



CSIR-Abontem ('extra early maize')

Identifying the best bet DT varieties in Malawi

In Malawi, the DTMA project works closely with the Ministry of Agriculture and Food Security, the Chitedze Research Station, Seed Co, Demeter Seeds and non-governmental organizations. During the last main cropping season (December 2009-March 2010), a severe drought hit these areas. However, two new varieties – ZM 523 and ZM 309 (jointly developed by CIMMYT and the Chitedze Research Station) – were noticeably more drought tolerant than other varieties grown. Farmers who grew the DT varieties were able to harvest a crop while their neighbors who grew other varieties suffered crop losses.

Bamusi Stambuli, from Balaka, estimated he will save US\$330 over 12 months from growing ZM 309. This year, Stambuli's maize yields of this variety were nearly twice those of other popular local varieties. "I will now be able to feed my family for 12 months," said Stambuli, who has seven children and five grandchildren.

ZM 309 and ZM 523 are providing a niche market for improved open-pollinated variety (OPV) seed. This year, Seed Co Malawi and Demeter Seeds increased their seed production to target the drought-hit areas. Seed Co's aimed to produce 165 tons of ZM 309 and 210 tons of ZM 523, while Demeter Seeds aimed to produce 520 tons of ZM 523. Demeter is also producing ZM 621, ZM 623 and ZM 721 – to increase farmers' DT maize options.

"Farmers are now asking for these varieties by name. We hope that from seeing the performance of ZM 309, farmers will be encouraged to start buying certified maize seed to boost production," says Dellings Phiri, Managing Director of Seed Co Malawi.

More: <http://www.cimmyt.org/en/about-us/media-resources/newsletter/715-maize-farmers-and-seed-businesses-changing-with-the-times-in-malawi>

Expanding drought screening capacity: new facility launched in Nanga, Zambia

Nanga, a national irrigation research station in Zambia, became the newest DTMA project drought screening site on 29 September 2010. The site represents significant investments by both CIMMYT (through the DTMA Project) and the Zambian Agricultural Research Institute (ZARI) and was selected because it has well defined dry and rainy seasons, uniform soils, and a reliable irrigation source. The site was inaugurated by Zambia's Deputy Minister of Agriculture, Enoch Embebe, and the participants included farmers, local leaders, students, the surrounding community and CIMMYT staff – Boddupalli Prasanna, Global Maize Program Director; Wilfred Mwangi, Associate Director and DTMA Project Leader; and maize breeders John MacRobert and Amsal Tarekegne. During the event, participants experienced firsthand the site's managed drought screening activities by viewing ongoing CIMMYT and ZARI drought trials. The site will enhance the DTMA Project's efforts of developing DT maize in southern Africa.

Ghana passes a new seed law

On June 4, 2010, Ghana's parliament passed the "Plants and Fertilizer Act of Ghana", which will have positive impacts for the country's seed industry, and the work of the DTMA project in Ghana and the greater West African region. The new Act is in three parts: the Seed Law, Fertilizer Law and Plant Protection Law. Through efforts coordinated by the Alliance for a Green Revolution in Africa (AGRA) and Ghana's Millennium Development Authority (MiDA), various stakeholders were engaged in reviewing the new law. AGRA's Policy Officer, Dr Augustine Langyintuo, led these efforts and was co-author of a recent DTMA project report on the West African seed sector that provided useful insights in the revision of the Act, which repeals all previous seed, fertilizers and pesticide laws. With the new laws, the country's private seed sector will be more involved in foundation seed production, previously a reserve of the state-run Ghana Grains Legumes Development Board. Expected benefits include better access by seed companies

to foundation seed (seed that is used to produce the seed which is finally sold to farmers), and a more vibrant and streamlined seed sector, with these benefits spilling over to Ghana's neighbors. Nigeria, Mali and Benin are the region's other DTMA project countries. More information: Dr Augustine Langyintuo, Alangyintuo@agra-alliance.org.

Projected pay-offs for Africa's farmers and consumers from drought tolerant maize

More than 4 million people in sub-Saharan Africa stand to escape poverty and several millions more will improve their livelihoods, if all current improved maize varieties were replaced with drought tolerant ones developed by the DTMA project between 2007 and 2016.

This is one of the broad aims of the project and one of the key findings of a recent study conducted in the 13 project countries (Angola, Benin, Ethiopia, Ghana, Kenya, Malawi, Mali, Mozambique, Nigeria, Tanzania, Uganda, Zambia, and Zimbabwe). The study - *Potential impact of investments in drought tolerant maize in Africa* – was led by CIMMYT socio-economist Roberto La Rovere, and evaluates the potential impacts of the DTMA project.



Using geographic information system data, data on the probability of failed crop seasons (PFS), yield data from breeders, projected maize adoption rates mainly from seed experts, and poverty data from socio-economists, the study's authors found that farmers and consumers will benefit from higher yields and from reduced season-to-season yield fluctuations, through the adoption by farmers of improved, drought tolerant maize varieties. At the most likely rates of adoption, based on several recent studies and expert advice, and assuming conservative yield improvements, drought tolerant maize can generate US\$ 0.53 billion from increased maize grain harvests and reduced risk over the study period. Assuming more optimistic yield gains, the economic benefit is nearly US\$ 0.88 billion in project countries. The most striking economic and poverty benefits will accrue in Nigeria, Kenya, and Malawi, based on the amounts of maize sown in these countries, the importance of maize in local diets and livelihoods, and their historical levels of adoption of improved maize. In comparison, the benefits will be more modest in Angola and Mozambique and moderate in Uganda and Mali.

The drought tolerant varieties considered are the product of conventional breeding—that is, they are not transgenic. It is expected that farmers who adopt these varieties will continue to grow them beyond 2016 – making the returns on investments to the project's work even more significant. This report is available on the DTMA website (<http://dtma.cimmyt.org>)

DTMA project at FARA African Agricultural Science Week

As part of advocacy efforts the DTMA project was represented at the Forum for Agricultural Research in Africa (FARA) African Agricultural Science Week during 19-23 July 2010, in Ouagadougou, Burkina Faso. FARA is a key umbrella organization for major agricultural stakeholders in Africa. The event tackled key issues affecting African agricultural research and development in the face of climate change and the global financial crisis, and was attended by more than 700 representatives, among them ministers of agriculture, researchers from international and national agricultural centers, policymakers, development partners, and partners from farmer and non-governmental organizations. The work of the DTMA project was found to be highly relevant as it addresses climate change.

The project was showcased as part of CIMMYT initiatives in Africa under the 'Market Place' side event and the DTMA project's progress in developing and disseminating new drought tolerant maize varieties was shown through poster displays, reports and leaflets; with a focus on getting seed into farmers' hands (through the Innovation Learning Platform in Malawi) and the 'crop insurance' element of DT maize. Among the visitors was Rwandan Minister of Agriculture, Dr Agnes Kalibata, who was interested in DT maize technology and how it could be introduced and scaled up in her country. Other visitors to the exhibition booth were also interested in the DT maize technology, how to obtain seed, and community-based seed production; and project publications – the seed sector study and policy briefs, and the seed business management in Africa manual. French translations of some of the materials proved useful and popular.

More information: www.fara-africa.org and <http://www.faraweek2010.blogspot.com/>



Promoting the DTMA Project through radio and video

DTMA project to begin radio extension partnership

More than 70% of smallholders in sub-Saharan Africa own a radio, and radio represents a very effective means of reaching farmers with agricultural extension messages. However, only 7% of radio airtime is devoted to agriculture, with a huge potential for more. In July, the Bill & Melinda Gates Foundation and Farmer Voice Radio (FVR) organized a workshop for 26 representatives from 10 foundation grants across 17 organizations, including the DTMA project, to explore opportunities available for maximizing airtime with radio stations. FVR is a consortium of radio broadcasters, agricultural experts, and farmers, established to provide a variety of agriculture-related radio programming, and serve as a megaphone for two-way extension priorities from content providers. FVR is planning a series of radio programs whose focus is to be on the farmer, with content developed collaboratively by experts, farmers and radio extension officers. The DTMA project will participate through generating content, and providing expert interviews. The work will initially be in Kenya and Malawi, and move out to Ghana, Mali, Tanzania and Uganda.

“Drought-tolerant maize - high yielding and affordable”

In September and October 2010, Wilfred Mwangi, DTMA Project Leader, and Dellings Phiri, Managing Director, Seed Co Malawi were interviewed by radio journalists in Kenya and Malawi on the emerging importance of drought tolerant open pollinated maize varieties, especially for smallholder farmers. Following is a short introduction to the interview:

For subsistence and smallholder farmers, buying improved maize seed, such as hybrid varieties, is a gamble. If rains fail, they can lose not only their crop, but also the savings they have invested in the seed. In response, the Drought Tolerant Maize for Africa (DTMA) project is developing open pollinated varieties of maize which have shorter maturity and offer high yields. They are also cheaper for seed companies to multiply, and therefore can be sold at a more affordable price. Wilfred Mwangi of DTMA and Dellings Phiri of Seed Co Malawi discuss the new varieties, and their growing popularity.

The interview is available at <http://www.agfax.net/radio/detail.php?i=380>

“Maize is Life”

On 16 October 2010, during the World Food Prize, Jeff Raikes, the CEO of the Bill & Melinda Gates Foundation screened a short film on the DTMA Project's work in Tanzania and Malawi. The film was produced by the Gates Foundation.

Following is a short introduction to the film: *For Sharifa Numbi, a smallholder farmer in Tanzania, maize is life. Maize nourishes her family at every meal. It's also her main source of income, giving her money to send her children to school, visit the doctor, and put a roof over her head.*

The video is available at <http://www.gatesfoundation.org/agriculturaldevelopment/Pages/maize-is-life-video.aspx>

Partners par excellence: Ethiopia, Ghana, Kenya, Nigeria, Zambia, and Zimbabwe win DTMA awards

To promote excellence and team work among national DTMA partners, the project awards the best teams in DT maize breeding and technology dissemination.

In eastern Africa, Ethiopia won both DTMA excellence awards – in breeding and variety dissemination - further raising the bar in

excellence standards. In West Africa, Ghana won the 2009 breeding award while Nigeria won the variety dissemination award. These regional awards were presented in February and March 2010, respectively.

In 2010, Kenya responded to Ethiopia's challenge and won the eastern African best technology dissemination team award with Ethiopia winning the best breeding team award for the fourth time running. In southern Africa, Zimbabwe won the best breeding team award, while Zambia won the best technology dissemination team award. We congratulate all the teams for their concerted efforts to develop and provide improved drought tolerant varieties to farmers in their region!

Training news

Empowering tomorrow's maize breeders

As part of nurturing the next generation of maize breeders, the DTMA project has so far trained more than 350 maize technicians and scientists through short-term in country courses, and technically supervised and backstopped 22 Msc, and 13 PhD students researching on drought in maize. Specific training initiatives in 2010 are highlighted below.

Kenya and Nigeria

Between 17 and 21 May, 2010, the Kenya Agricultural Research Institute (KARI) and the DTMA project organized a training workshop for 35 maize technicians, in Embu, Kenya. Course participants came from five KARI stations, seed companies, NGOs, and the CIMMYT field station in Kiboko. A similar training was conducted at IITA in Nigeria from 19-24 July 2010, with participants from Ghana, Nigeria, Mali and Benin. The trainees got an opportunity to upgrade their skills and knowledge of field trial management, variety testing, registration, and release. Topics covered included breeding for abiotic and biotic stress, management of trials and nurseries, hybrid development, on-farm variety testing, seed production, variety descriptors, variety release and registration, and use of the CIMMYT Fieldbook (software for pedigree and data management). Course presentations were in the form of lectures, demonstrations, and practical sessions.

Christine Khamua from KARI-Kakamega said, “I have especially learnt a lot about randomization of trials.”

Zimbabwe

A training course on maize breeding was held in Harare, Zimbabwe, during 16-31 August 2010 to share new breeding methods and technologies, with early-career maize breeders interested in maize improvement for stress environments. The course, was jointly organized by the DTMA project and the Department of Research and Specialist Services (DR&SS) of the Zimbabwe Ministry of Agriculture, and attracted 57 participants from the private sector and various national agricultural research systems (NARS) from almost all of the DTMA countries. The course covered aspects of: breeding maize with desirable traits (drought tolerance, disease and insect resistance, and good yield); and the use of: marker-assisted breeding and transgenics in maize improvement; advanced information technology tools in maize breeding; and doubled haploid technology to accelerate the development of maize inbred lines. Although focusing on maize, the course also covered general aspects of choosing desirable parents for breeding programs. The course participants observed the maize-breeding process firsthand when they visited the on-going CIMMYT and DR&SS drought screening trials at breeding nurseries in Chiredzi, Chisumbanje, and Mzarabani.