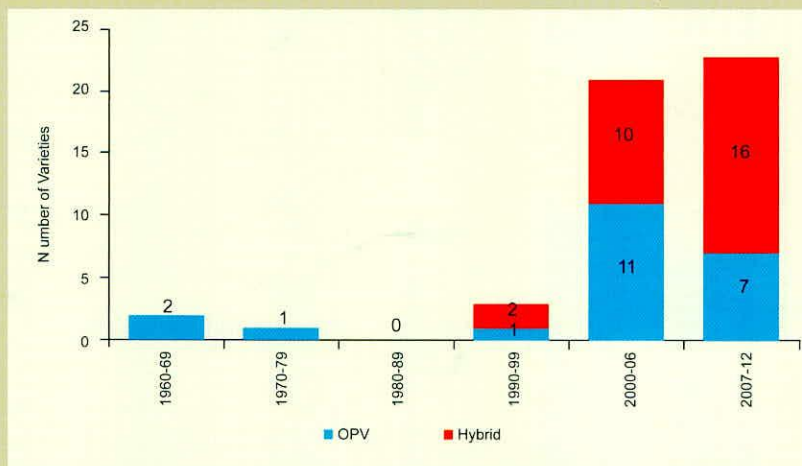


About the Bulletin

DT Maize is a quarterly publication of the DTMA (Drought Tolerant Maize for Africa) project, funded by the Bill & Melinda Gates Foundation. Its aim is to inform partners and the general public at large about developments related to drought tolerant maize in Sub-Saharan Africa. It publishes short, general articles, relevant news, and events related to DTMA. Articles and news on all aspects of maize in Africa from sister projects and other partners are also welcome. Any feedback from our readers would be appreciated.



Number of open pollinated maize varieties and hybrids released in Uganda during different periods

Drought Tolerant Maize in Uganda: Progress and Prospects for DTMA

Background

Maize occupies the largest area of all crops and is grown by the largest number of households in Uganda. According to Uganda Bureau of Statistics (UBOS, 2007), nearly 86% of all smallholder farmers (nearly 3.6 million households) in the country grew maize during the 2005/06 crop seasons. According to UBOS (2010), the total area planted to maize in 2008/09 was estimated at more than 1 million ha (about 20% of the total crop area). Other major crops include cassava, common bean, sweet potato, bananas, coffee, sesame and tea. Maize in Uganda is grown both in pure stands (47%) and as a mixture, or intercrop (53%).

Smallholder farmers all over the country grow maize for food security and household income; it is also used as an important source of feed and non-traditional export crop. Export earnings for 2011/12 are estimated at US\$ 28¹.

The crop had a lackluster performance through the early second half of the 1980s; it showed a steady growth between the early 1990s and late 2000s. Faster growths have been registered in more recent years, mainly due to increased adoption of improved varieties. Growths in yield, and hence in production, were particularly impressive, as presented in Figure 1. For example, the annual rates of growth for area, yield and production for the 1991-2000 (and 2001-2010) period were 4.4% (5.0%), 1.3% (3.1%), and 5.8% (8.3%), respectively. The average yield for 2009-10 was approximately 2400 kg/ha, which is appreciably greater than the SSA average of less than 1800 kg/ha.

Box 1: Codes used to define maize yields (MT/ha)*

Yield code	Maturity group			
	Very Early	Early	Medium	Late
Very high	>6	>7	>8	>9
High	5-6	6-7	7-8	8-9
Medium	4-5	5-6	6-7	7-8
Low	3-4	4-5	5-6	6-7
Very low	<3	<4	<5	<6

*See Table 1

¹Bank of Uganda, Annual Report 2011/12

Maize Agro-ecology in Uganda

Uganda's maize agro-ecology can be categorized as largely mid-altitude and highland. The bulk of maize is grown in the mid-altitude that occupies about 85% of the total maize and the highland ecology occupies 15%. However, the highland agro-ecology, particularly the Mt. Elgon region, is a major growing area, accounting for about 30% of the total production. Regionally, the largest production is in Eastern Region (38%), followed by Northern Region (24%), Central Region (19%), and Western Region (19%). Uganda has two distinct growing seasons; the first season runs March to June, and the second September to December.

Maize Varieties in Uganda

The National Agricultural Research System in Uganda released a total of 27 maize varieties between 1960 and 2006 (avg. = 0.59 varieties per year). These included 12 hybrids and 15 OPVs. Variety releases were very slow through 1999. For example, two varieties were released in 1960; one each in 1971 and 1991; and two in 1999. The first hybrids (Longe 2H and Longe 3H) were released in 1999. The frequency of variety releases showed accelerated improvement starting from 2000 (see top of front page); from 0.2 varieties per year in the 1960s and 0.1 per year in the 1970s, it reached 3.5 varieties per year between 2000 and 2006, and 4.2 varieties per year between 2007 and 2012 (see front cover).

Variety release in Uganda is carried out by both national and regional research organizations, as well as national, regional and international seed companies. The National Agricultural Research Organization (NARO) was responsible for 18 of the 42 varieties released in the country to date. Other companies include: PANNAR, Kenya Seed Company (KSCO), Monsanto, Farm Inputs Care International (FICA), Pioneer, Seed Co, Uyole, Victoria Seeds, NASECO, East African Seeds, and Western Seed Company (WSCO).

The national maize team of Uganda, in collaboration with DTMA, has released a total of seven varieties in recent years (Table 1). These included six hybrids and one OPV. Three of the varieties are in the early-intermediate maturity (115-120 days) group whereas four are in the intermediate maturity (120-125 days) group. On-farm yields of the hybrids range from low-medium (4-6 MT/ha) to very high (8-9 MT/ha), as defined in Box 1. In addition to being drought tolerant, these varieties are resistant to major foliar diseases such as maize streak virus (MSV), northern leaf blight (NLB), and grey leaf spot (GLS).

All of the varieties are suited to altitudinal ranges of 1000–1600 meters above sea level, which covers the bulk of the maize growing areas of Uganda. The pipeline for development of drought tolerant varieties is also filled with a number of segregation populations at different stages with known drought tolerant backgrounds. In addition, six DTMA varieties are currently in the final testing stages of National Performance Trials.

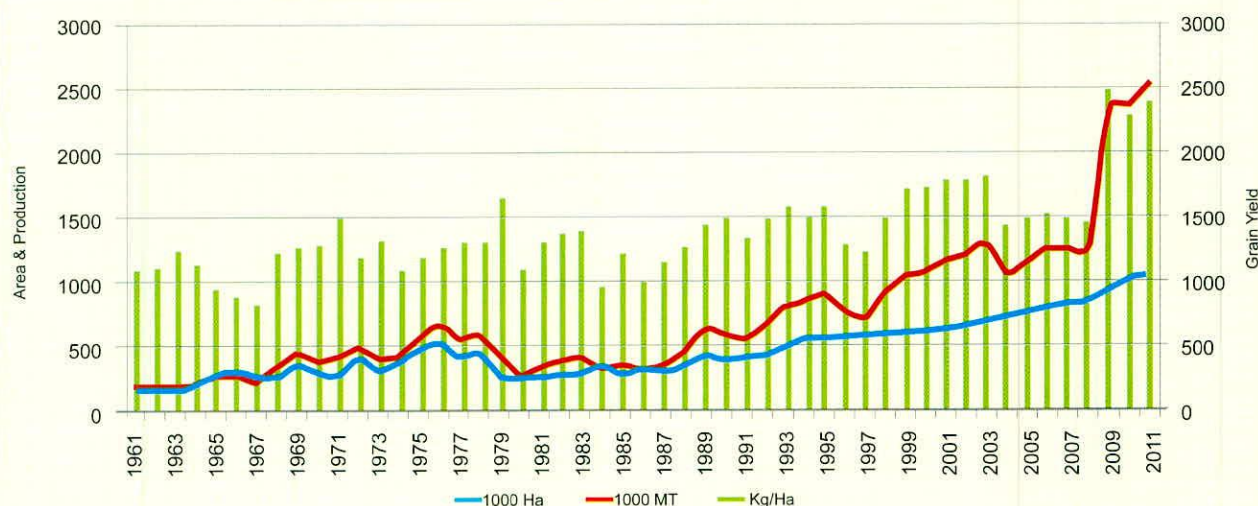


Figure 1: Performance of maize in Uganda (source: calculated from FAOSTAT, Feb 2013)

Table 1: Drought tolerant maize varieties released under DTMA in Uganda (2007 to July 2013)

Release name	Year of release	Hybrid/ OPV	Maturity range (days)	Suitable altitudes (m)	Grain yield category*	Special/additional traits
Longe 9H	2009	Hybrid	120-125	1000-1600	High	Resistant to MSV, NLB & GLS
Longe 10H	2009	Hybrid	120-125	1000-1600	Very high	Resistant to MSV, NLB & GLS
Longe 11H	2009	Hybrid	120-125	1000-1600	High	Resistant to MSV, NLB & GLS
UH 5051	2012	Hybrid	115-120	1000-1600	Medium to high	Suited to mid-altitudes
UH 5052	2012	Hybrid	115-120	1000-1600	Medium to high	Suited to mid-altitudes
UH 5053	2012	Hybrid	115-120	1000-1600	Medium to high	Suited to mid-altitudes
VPMAX	2012	OPV	120-125	1000-1600	Low to medium	

*See Box 1

Availability of Drought Tolerant Maize Seed in Uganda

A total of 1572 MT of drought tolerant maize varieties seed was produced in Uganda during the 2011/12 seasons. This included the old varieties (those released before 2007) Longe 5, Longe 7H, Longe 4, and Ssalongo; and the new variety Longe 10H (Figure 2). Longe 5 and Ssalongo are QPM. The total amount of seed produced for the reporting period is adequate to cover nearly 63,000 ha of land that would consist of more than 157,000 households of smallholder farmers. In a similar fashion, the total amount of the new variety, Longe 10H, is estimated to cover nearly 15,000 ha or 37,000 households.

NASECO was the seed company that contributed the largest amount of seed production for the reporting period. It was followed by Grow More, Arolim, Victoria, FICA and Pearl. The challenge for the national maize team is how to accelerate seed production of the newly released maize varieties.

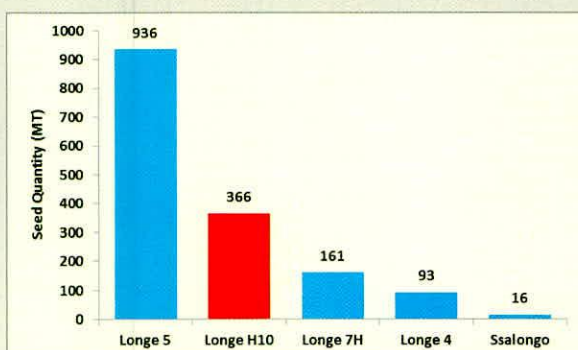


Figure 2: Quantity of old (blue bars) and new (red bar) varieties of maize seed produced during the 2011/12 seasons in Uganda.

It has been projected that the total quantity of drought tolerant maize seed produced (for each year) in the next four years in Uganda would be: 930 MT (2013); 1420 MT (2014); 1940 MT (2015); and 2870 MT (2016). This indicates that the quantity of the new drought tolerant maize seed produced by 2016 would be enough to cover a total area of nearly 115,000 ha that could benefit some 287,000 smallholder households (or 1.44 to 2.01 million people) producing maize in Uganda.

DTMA has established partnerships with NARO and various categories of seed companies in Uganda, as is the case with all other target countries, to strengthen them through provision of breeding populations, varieties for testing, breeders' seed, and capacity building, among others.

Uganda has a good record of its priority for agricultural research and development. The total public expenditure for agricultural research and development in this country more than doubled in less than a decade. For example, it grew from US\$ 40.2 million in 2000 to US\$ 88.0 million² in 2008. The government, through the Development Investment Plan (DSIP) of the Ministry of Agriculture, Animal Industry and Fisheries, has prioritized maize as the top crop commodity for poverty alleviation.

The NARS scientists should take this opportunity to bring about accelerated development of drought tolerant maize in Uganda. ■

*Tsedek Abate (CIMMYT-Kenya);
Godfrey Asea (NARO-Uganda);
Dan Makumbi (CIMMYT-Kenya)*

² 2005 Purchasing Power Parity

News and Events

Support for DTMA Comes from an unlikely source!



Lizzie Stevenson is a 14-year old 9th-grader champion athlete and humanitarian who lives with her family: Graeme (father), Ally (mother), and Annie (sister), in Flaxton, North Canterbury, New Zealand. One day, at age 12, she thought of doing something that would help

smallholder farmers who struggle to overcome the effects of drought on maize production in Africa. She started raising funds from her community. She did not quite know how to disburse the funds she raised. One day she made contacts with Dr. Greg Edmeades, a well-known maize scientist from her country, who has worked extensively on maize in Africa, Asia and Latin America. Greg connected her with the DTMA team in Kenya and Zimbabwe.

It was decided to use the funds for purchasing drought tolerant maize seed for a community of smallholder maize growers in Zimbabwe who

face frequent drought. Dr. Cosmos Magorokosho, a CIMMYT maize breeder based in Harare, is currently organizing the farmers to plant drought tolerant maize in the coming season (starting December) using the funds that Lizzie has raised – NZD 4,303.55 (approximately US\$ 3,363.54).

Lizzie has collected a large number of championship medals and prizes for sports and academic excellence. She is selected to represent her country at the 2013 World Age Group Trampoline Championships to be held in Sofia, Bulgaria, 14-17 November, 2013.

Lizzie's future ambitions include, in her own words "University study to achieve a qualification and the experience to have a successful career that helps others and makes a positive difference to this world; To work hard and influence others with my positivity to make the most of all things in life; and To love a great family life and to enjoy fulfillment and happiness!."

We wish to see Lizzie's future ambitions fulfilled and remain her fans forever! ■

Major visits and meetings by DTMA scientists

Places visited	Scientist(s) involved	Date	Major tasks
Ethiopia (Addis Ababa, Haramaya University)	T Abate	3-6 July	Recruitment of DTMA staff; Dialogue on Ethiopian agriculture
Zambia (Lusaka)	T Abate, J MacRobert, C Magorokosho, A Tarekegne	7-9 August	Attend NSIMA Collaborators' Annual Meeting
Kenya (Nairobi)	T Abate	African Food Security Conference	Paper presentation "Are we asking the right questions and telling stories?"
Uganda (Soroti, Lira, Bulindi, Namulonge, Kampala, Entebbe)	T Abate, D Makumbi	23-26 August	On-station/ on-farm trial visits; policy discussions with government and other officials
Tanzania (Arusha, Babati, Karatu)	T Abate, D Makumbi, F Sipalla	28-30 August	Visits to experiments, seed production sites; policy discussions with officials
Kenya (KARI-Embu)	T Abate, F Sipalla	5 September	On-station visits and discussions with officials