DTMA Drought Tolerant Maize for Africa

DT MAIZE

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A Quarterly Bulletin of the Drought Tolerant Maize for Africa Project

About the Bulletin

DT Maize is a quarterly publication of the Drought Tolerant Maize for Africa (DTMA) 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.

Open air maize storage in Darabougou village of Sikasso, southern Mali (Photo: Tsedeke Abate, 11/11/2013)

Maize in Mali: Successes and Opportunities

Overview

Mali is West Africa's third largest producer of maize even though it stands fifth in the area harvested. The 2010-13 FAO data show that the total area harvested is close to 0.7 million hectares, with annual production of nearly 1.5 million metric tons. Mali has the highest average yield of 2.35 t/ha amongst all the 15 countries that produce maize in the sub-region, compared to 1.94 t/ha for Cote d'Ivoire, 1.80 t/ha for Nigeria, 1.78 t/ha for Ghana and 1.65 t/ha for Burkina Faso. Said another way, this means an average yield gain of 121.4 kg/ha/year, in comparison to -19.8, 44.3, 30.7, and -3.3 kg/ha/year, respectively, for Cote d'Ivoire, Nigeria, Ghana, and Burkina Faso between 2000 and 2013.

Mali has the fastest growing maize area and production among its neighbors (Figure 1). The annual rate of growth (ROG) between 1980 and 2013 in area (and production) for maize in Mali was 6.6% (9.0%), in comparison to 4.1% (5.6%) for Nigeria, 2.7% (4.9%) for Ghana, and 2.7% (4.6%) for Benin. The ROGs for yield were 2.2% each for Mali and Ghana, 1.9% for Benin and 1.5% for Nigeria (Figure 1).

In Mali, maize ranked seventh in 1980, after millet, sorghum, groundnut, rice, cowpea and fonio; just over a decade later it ranked fourth, only behind millet, sorghum and rice; since 2010 it has firmly established itself as the number three crop of Mali,

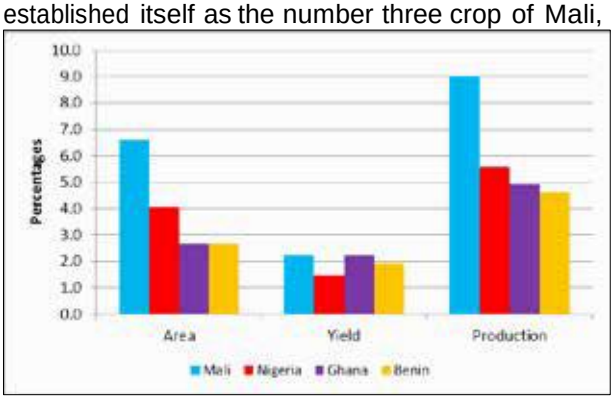

Figure 1: ROGs for maize area, yield and production in four West African countries between 1980 and 2013 (source: constructed by the authors from FAOSTAT, 10/03/2015)

after millet and sorghum. In other words, maize is the fastest growing staple in Mali. As stated above, maize area grew at an annual rate of 6.6% between 1980 and 2013, compared to 4.7% for rice, 3.6% for groundnut, 2.7% for sorghum, 2.6% for millet and 2.5% for cowpea.

In general, maize showed steady progress in terms of area expansion and production (Figure 2). There was relatively more sustained growth in area and production between the first quarter of 2000s and 2010s; positive changes were also observed in yield even though there have been dips during drought

years.

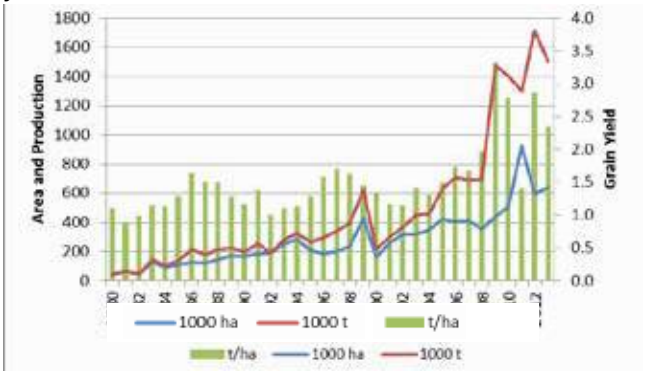

Figure 2: Performance of maize in Mali between 1980 and 2013 (source: constructed by the authors from FAOSTAT, 10/03/2015)

Maize in Mali is grown by smallholder farmers, whose average land holdings are less than 3 ha. Women account for 60% of labor, in addition to processing and marketing. Approximately 30-40% of the grain produced in Mali is sold commercially whereas the remainder is used as food in the households. The average per capita consumption is estimated at about 53 kg/person/year.

Major Constraints

Like most other countries in Sub-Saharan Africa, Mali has its share of natural, technical, socioeconomic and institutional constraints to adoption of improved maize varieties. Drought is the most important natural constraint. Farmers in Mali reported drought frequency of four years out of ten between 2004 and 2013. Fifty percent of these farmers said that they could not afford the price of improved maize seed. There is very limited government extension service in Mali. For example, only 11.1% of the farmers interviewed said they receive their information about improved maize varieties from government extension, compared to 61.0% in Benin, 52.0% in Ghana, and 46.7% in Nigeria. There is shortage of labor and farm equipment, which adversely affects women farmers in particular. Mali's postharvest handling of maize leaves a lot to be desired. Maize is stored in open air and is exposed to aflatoxin contamination and quality loss.

Major Agro-ecologies

Mali has four main agro-ecological zones, viz. Pre-Guinea Savanna (1100 mm rainfall, 5 months, sandy or sandy loam soil), Sudan Savanna (600-1100 mm), Sahelian Zone (200-600 mm) and Sahara Zone (<200 mm). Sudan Savanna accounts for about 70% of total maize area, followed by Pre-Guinea Savanna (20%), Sahelian Zone (8%) and Sahara (2%, under irrigation). Major maize growing administrative regions (Figure 3) include Sikasso (59%), Koulikoro (17%), Kayes (16%), and Ségou (7%).

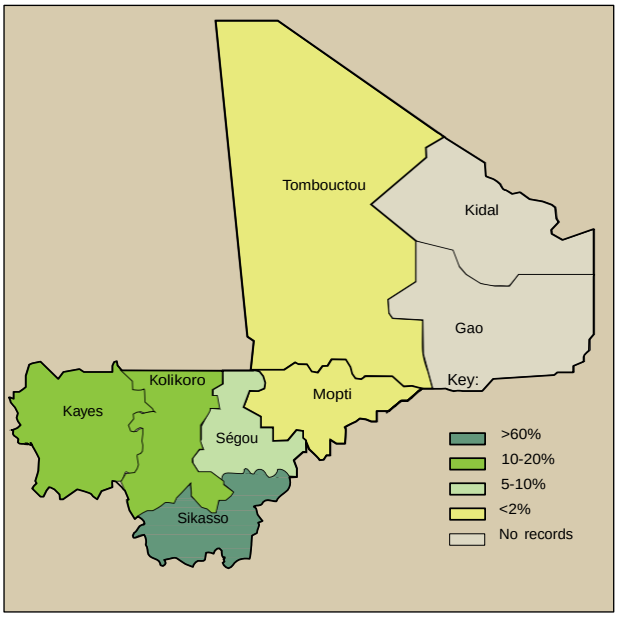

Figure 3: Distribution of maize production in Mali. (Source: Enquête Agricole de Conjocture)

Dominant Varieties

Available records show that variety releases in Mali started with an open pollinated variety (OPV) Tiémanté (or Zambalara) in 1972 and the first hybrid in 1985. A total of 40 varieties have been released through 2014. These included 6 hybrids and 34 OPVs. The frequency of variety releases in Mali has been sporadic, especially more so for hybrids (Figure 4). For example, it took 10 years to release the second OPV and nine years for another hybrid. There was only one hybrid release in 23years, between 1988 and 2011.

A total of 12 varieties, including nine hybrids and three OPVs, were released between 2009 and 2014, with the help of the DTMA project; five of the hybrids were released in 2014 alone. What this implies is that variety release in Mali is sporadic and project-dependent. The increased frequency of varieties in the mid- 1980s and early 1990s was due to the WECAMAN project implemented by IITA, as is the case between 2007 and 2014 with the DTMA project.

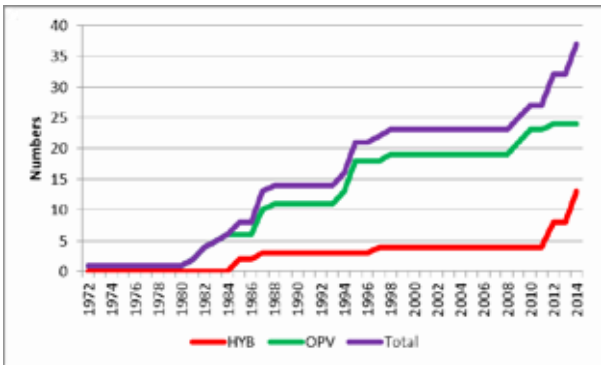

Figure 4: Maize variety releases in Mali between 1972 and 2014 (source: own informal surveys)

A recent DTMA monitoring survey shows that a total of 15 varieties were grown in the areas surveyed in 2013. These included four improved OPVs and 11 local or traditional varieties. The area covered by improved OPVs and traditional varieties accounted for 40.1% and 59.9%, respectively, meaning that the total area covered by modern maize varieties was 40.1%. The survey results showed that the OPVs Sotubaka and Dembanyuman (Obatanpa), released in 1995 and 1998, respectively, were by far the most dominant varieties grown by farmers in Mali. Out of 397 households interviewed in 40 villages in 2013, Sotubaka and Dembanyuman covered 23.5% and 23.2%, respectively, of all maize plots grown by those households. Jorobana and Brico were the other two improved OPVs released under DTMA in 2009 and 2010, respectively, and accounted for 1.9% and 1.3%. The average age of maize varieties (all OPVs) grown in Mali is about 18 years.

Seed Systems

The maize seed system in Mali is dominated by small private companies, one public company and 22 community-based organizations (CBOs) or farmers' cooperatives. The small private companies include Comptoire 2000, Faso Kaba, Nakoshi, Agritech, SOSEM, and Seed Farm. The only public seed company is the Seed Service of Mali, located in Ségou. There are no regional or transnational seed companies in Mali. The CBOs were established between 2001 and 2006.

Faso Kaba is the largest and most well-known seed company in Mali. It is the only company with established warehouse facilities and seed processing machinery. However, it has only recently added a breeder trained at the MSc level in it work force; none of the other companies and CBOs has such facilities.

Trade

Mali was a net importer of maize grain between the late 1960s and second half of 1980s (Figure 5). According to the FAOSTAT, the country has brought down its import volumes to an absolute minimum and exports even outpaced imports in the mid- 2000s. This has been made possible due to increased production.

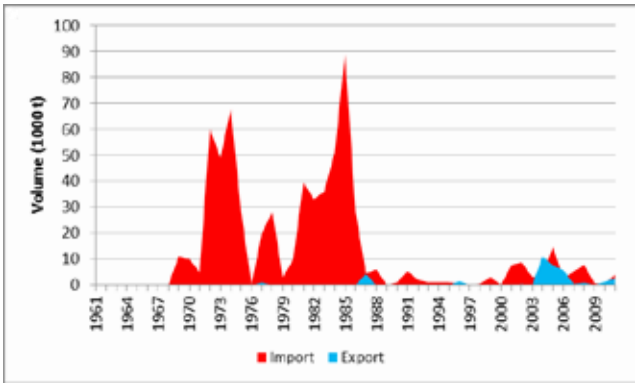

Figure 5: Maize trade in Mali (source: constructed by the authors from FAOSTAT, 10/03/2015)

Research Capacity

Informal surveys carried out by one of the authors (Abate) revealed that Mali has full time equivalent (FTE) researchers of 9 that consisted of 2 PhD, 3 MSc, and 4 BSc degree holders as at 2013. This would mean 4.9 FTE researchers for 1 million tons of maize grain produced. If only PhD and MSc holders are considered as researchers, then the figure becomes 2.7 researchers for 1 million tons of maize produced. All of the maize researchers reported in Mali in 2013 were men.

In summary, maize is the fastest growing staple in Mali. Production grew at the rate of 9.0% per annum between 1980 and 2013 and the country has been no longer a big importer of maize grain. However, this growth resulted mainly from faster growth rates of area as opposed to increases in yield. Variety release has been sporadic and project-dependent. Current research capacity and extension services need substantial government investment for sustainable growth of maize production in Mali.

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News and Events

Country Launches for DTMASS

The country launch meetings for Drought Tolerant Maize for Africa Seed Scaling (DTMASS) that started in December 2014 continued in January and February 2015. These are summarized in the box below. The meetings helped to introduce the new project to national partners and officials in Tanzania, Kenya, and Uganda and obtain their buy-ins. These are summarized in box 1. Represented in each of the meetings were seed companies, ministry of agriculture, extension, research organizations, USAID and CIMMYT.

Box 1: Summary of meetings held

Country	Date	Venue	No. of participants
Tanzania	22/01/2015	White Sands Beach Hotel, Dar es Salaam	23
Kenya	02/02/2015	Tribe Hotel, Nairobi	24
Uganda	04/02/2015	Imperial Royale Hotel, Kampala	35

DTMASS Launch, Tanzania

DTMASS Launch, Kenya

DTMASS Launch, Uganda

Maize Working Group Meeting Held

The Annual DTMA Eastern Africa Maize Working Group meeting was held on19-20 February 2015 at Jacaranda hotel in Nairobi. Progress made in variety release and seed dissemination in 2014 was reviewed, and plans for 2015 discussed and approved. Awards were given for national teams that showed outstanding performance for the year. Top awards for breeding as well as seed dissemination were won by Uganda whereas Ethiopia and Tanzania were runners up for breeding and seed dissemination, respectively.

STMA Planning Meeting Held

Two senior officials from the Bill and Melinda Gates Foundation, Tony Cavalieri and Gary Atlin, held a one-day meeting with senior researchers from CIMMYT and IITA, in Nairobi on 31 March 2015. The purpose of the meeting was to agree on an outline of a new project proposal for Stress Tolerant Maize for Africa (STMA) that would subsume the DTMA and Improved Maize for African Soils by end of 2015. A consensus was reached on the content and way forward.

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