

Subject: **Forecasted Maize Yield**

Region: **Southern Africa**

Issuing date: **1 March 2011**

INTRODUCTION

The present document provides a preliminary forecast of crop yield expected at the end of the current growing season. Forecasts are provided from halfway the growing season (70 growing days). Although at that time the most critical stages of crop development have passed, the final outcome may still be subject to some change depending on how the second half of the season proceeds. Our forecasts are updated with the most recent satellite data available and distributed through email on a personal subscription basis every ten days.

SUMMARY

Below average maize yields in 4 countries

The FAST crop yield forecast points to below average maize yields in Swaziland (-9%) and Namibia (-8%). However, in Namibia the picture may still change as the growing season proceeds. In the main growing areas of Malawi and Mozambique yields are expected to fall 5-6% below average.

A very good maize yield is expected in Lesotho (+14%). Good yields are also anticipated in Botswana: 13% above average in the main growing areas and +6% overall. South Africa is also doing well with an estimated +9% in the main growing areas and +5% overall.

It is noted that within the countries there may be large and contrasting differences between provinces. Details may be found in table 2, which presents the expected yields at GAUL1 level. Although the growing season is more than halfway in most countries, some developments may still take place. This applies in particular to Botswana and Namibia.

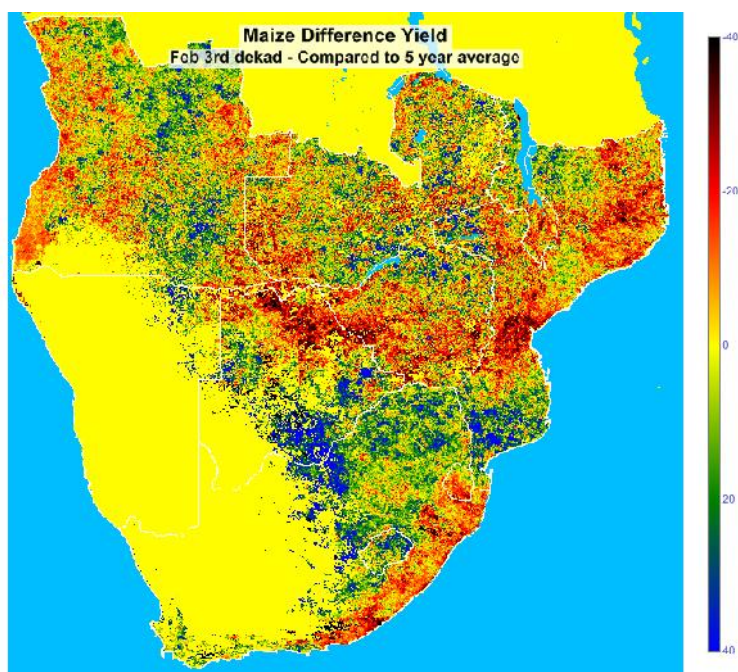


Figure 1: Crop difference yield relative to the 5 yr average (in %)

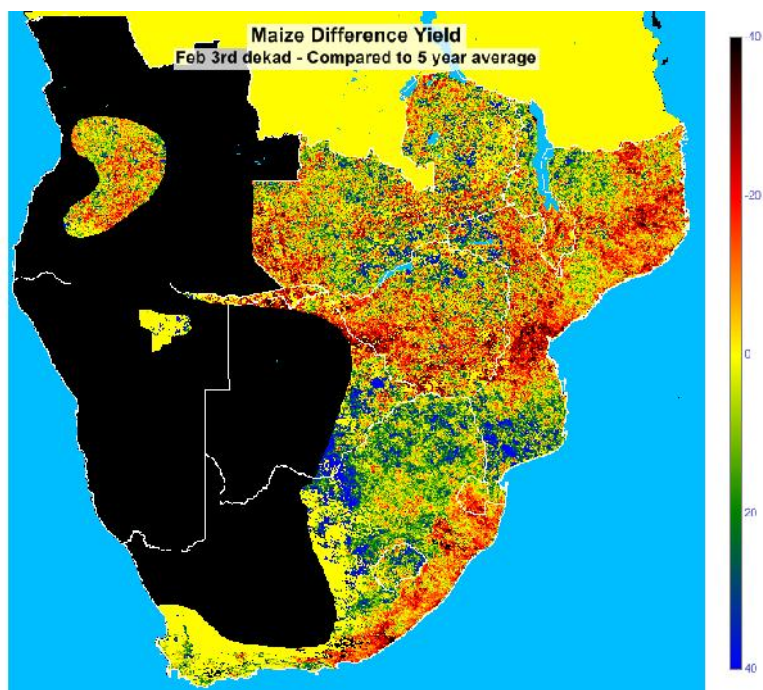


Figure 2: Crop difference yield relative to the 5 yr average for all maize growing areas (in %)

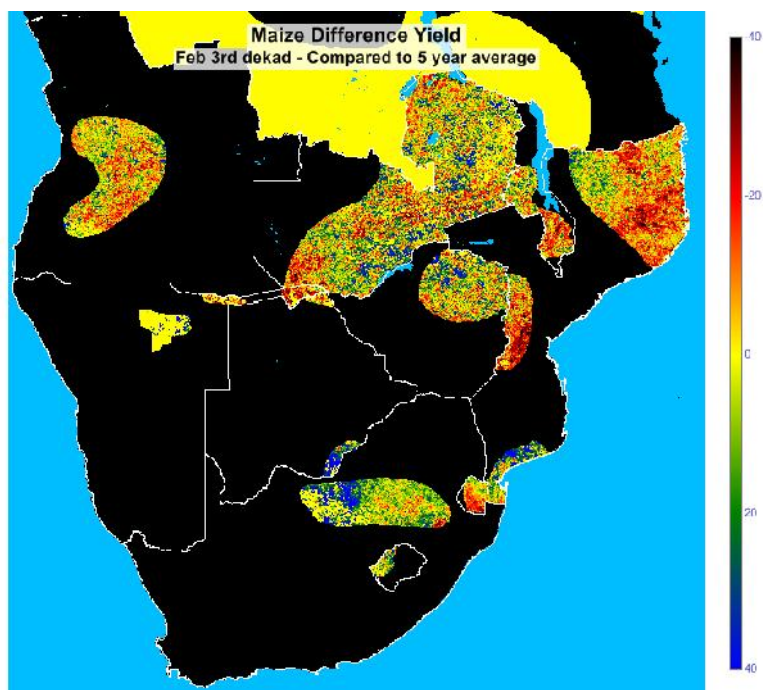


Figure 3: Crop difference yield relative to the 5 yr average for the main maize growing areas (in %)

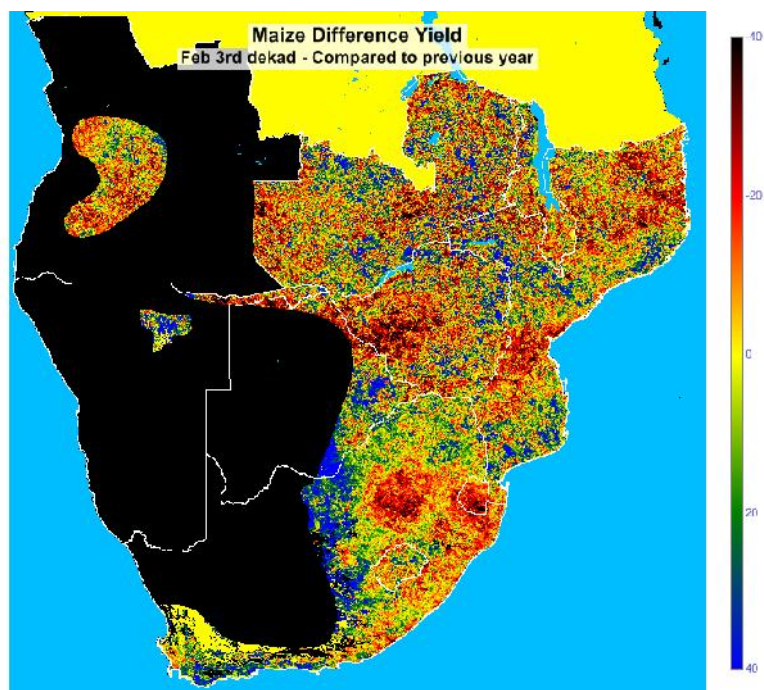


Figure 4: Crop difference yield relative to the previous year for all maize growing areas (in %)

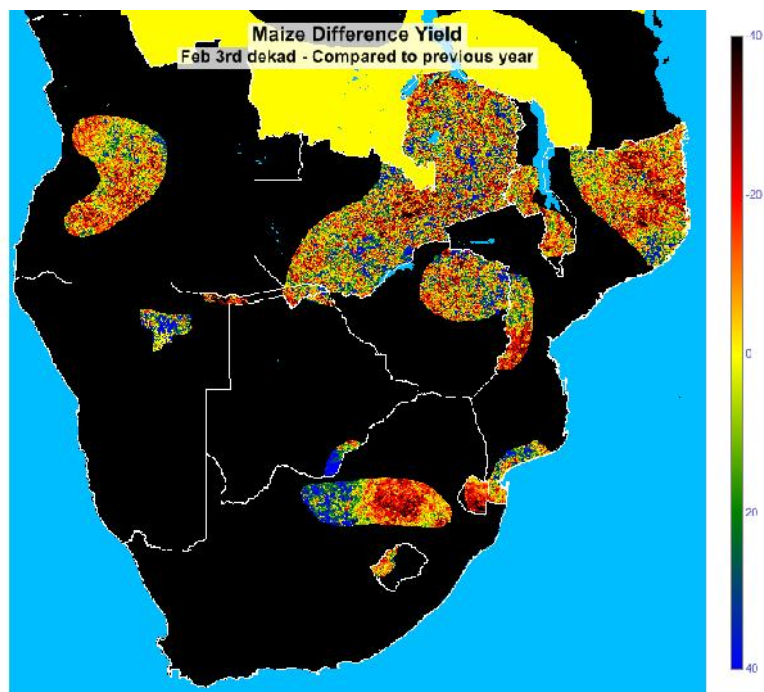


Figure 5: Crop difference yield relative to the previous year for the main maize growing areas (in %)

METHOD

FAST is the acronym of *Food Assessment by Satellite Technology*, a Meteosat based crop yield forecasting system developed and operated by EARS in Delft, the Netherlands. The assessment of crop growth conditions and the crop yield forecasts are based on visible and thermal infrared hourly data. These data are processed in 3 steps:

- (1) Hourly Meteosat data are processed to daily average values of surface temperature, air temperature, global radiation, net radiation, potential and actual evapotranspiration.
- (2) Radiation and evapotranspiration data enter into a crop growth model, which simulates crop yield on a daily basis.
- (3) Distributed crop yield results are integrated for crop growing areas, countries and provinces. Urban areas, forest, water and barren land are excluded.

CROP

The crop calendar in Figure 6 shows the vegetative period (green), the mid-season period (grey) and the harvesting period (yellow) for the countries in the region. The yield response of the plant to evapotranspiration deficits during the growing season is quantified by the yield response factor k_y , based on the relationship described by Doorenbos & Kassam (1986):

$$(1-RY) = K_y (1-RE)$$

RY is the relative yield and RE the relative evapotranspiration. Drought sensitivity of a crop changes during the growing season. For maize, k_y is 0.4 during establishment, increases to 1.5 during the vegetative period, is kept constant at 1.5 during flowering and yield formation and decreases to 0.5 during ripening.

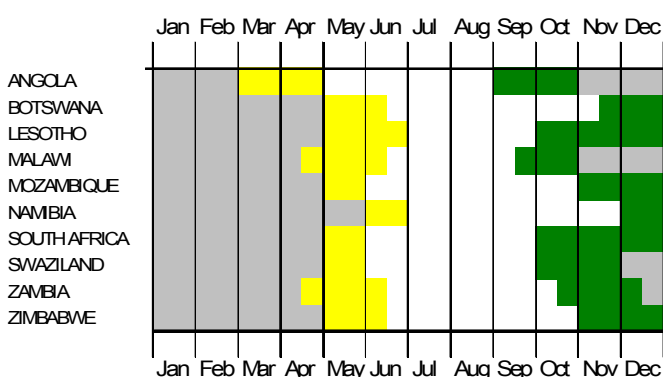


Figure 6: Maize Crop Calendar © FAO 1997

MAPS

The maps on the next page show the Meteosat derived difference yield relative to the historical average yield of five years (Figures 1-3) and to the previous year (Figures 4 and 5).

TABLES

The following tabulated data are provided:

Table 1 : Difference yield forecasts at national level

Table 2 : Difference yield forecasts at GAUL level 1

The difference yields for each country, region or province have been determined by spatial integration of pixel values within agricultural areas and the growing areas of the crop. Data at national level are provided both for main and all growing areas.

The difference yield (DY) presents the forecasted yield of the current year in terms of % deviation from a reference yield. The difference yields are calculated:

- relative to the historical average yield of the five previous years $Yield_{hist}$:

$$DY_{2009 / hist} = \frac{Yield_{2009} - Yield_{hist}}{Yield_{hist}}$$

- relative to the yield of the previous year $Yield_{2008}$:

$$DY_{2009 / 2008} = \frac{Yield_{2009} - Yield_{2008}}{Yield_{2008}}$$

CONTACT

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REFERENCE

Doorenbos, J., Kassam, A. H. (1986). Yield response to water. FAO irrigation and drainage paper 33. Food and Agricultural Organization of the United Nations, Rome.

CROP GROWING AREAS

FAO crop growing areas (<http://www.fao.org/giews>)

LANDUSE

U.S. Geological Survey, Global Land Cover characteristics data base (<http://edc2.usgs.gov/glcc>)

ADMINISTRATIVE BOUNDARIES

National, regional or provincial averages are calculated based on the administrative boundary layers from the Global Administrative Unit Layers (GAUL) system.

LEGAL NOTICE & DISCLAIMER

The crop yield forecasts are issued to the best of our knowledge and the hypothesis that the remaining part of the season will not face additional extreme events. EARS bv is not responsible or liable, directly or indirectly, for any damage or loss caused or alleged to be caused in connection with your use of the information.

The geographic borders are purely a graphical representation and are only intended to be indicative.

TABLE 1 MAIZE YIELD FORECASTS AT NATIONAL LEVEL

SOUTHERN AFRICA	Difference Yield (%)			
	All Growing Areas		Main Growing Areas	
	11/5yrs	11/10	11/5yrs	11/10
ANGOLA	1	-4	1	-4
BOTSWANA	6	7	13	16
LESOTHO	14	4		
MALAWI	-2	-3	-5	-6
MOZAMBIQUE	-1	-1	-6	-4
NAMIBIA	-9	-3	-8	-1
SOUTH AFRICA	5	-4	9	-11
ZAMBIA	2	1	3	2
ZIMBABWE	-2	-1	6	4
SWAZILAND	-9	-20	-9	-21

TABLE 2 MAIZE YIELD FORECASTS AT PROVINCIAL LEVEL

ANGOLA	Difference Yield (%)	
	All growing areas	
	11/5yrs	11/10
BIE	0	5
CUANZA SUL	2	-5
HUAMBO	1	2
HUILA	-2	-10

BOTSWANA	Difference Yield (%)	
	All growing areas	
	11/5yrs	11/10
CENTRAL	6	9
CHOBE	-9	-9
KGATLENG	10	-1
KWENENG	21	19
NGAMILAND	-22	-25
NORTH EAST	4	2
SOUTH-EAST	34	44
SOUTHERN	30	49

LESOTHO	Difference Yield (%)	
	All growing areas	
	11/5yrs	11/10
BEREA	18	11
BUTHA BUTHE	9	-8
LERIBE	7	-6
MASERU	16	9
MOHALE'S HOEK	6	-2
MOKHOTLONG	23	16
QACHA'S NEK	6	-4
QUTHING	17	8
THABA TSEKA	15	4

MALAWI	Difference Yield (%)	
	All growing areas	
	11/5yrs	11/10
AREA UNDER NATIONAL ADMINISTRATION	-1	0

TABLE 2 MAIZE YIELD FORECASTS AT PROVINCIAL LEVEL

MALAWI	Difference Yield (%)	
	All growing areas	
	11/5yrs	11/10
NORTHERN REGION	5	2
SOUTHERN REGION	-9	-5

MOZAMBIQUE	Difference Yield (%)	
	All growing areas	
	11/5yrs	11/10
CABO DELGADO	-7	-9
GAZA	13	2
INHAMBANE	8	7
MANICA	-10	-5
MAPUTO	19	10
NAMPULA	-13	-3
NIASSA	-3	-6
SOFALA	-13	-4
TETE	1	3
ZAMBEZIA	-5	1

NAMIBIA	Difference Yield (%)	
	All growing areas	
	11/5yrs	11/10
CAPRIVI	-14	-2
KAVANGO	-7	-14
OSHIKOTO	1	13
OTJOZONDJUPA	0	21

SOUTH AFRICA	Difference Yield (%)	
	All growing areas	
	11/5yrs	11/10
EASTERN CAPE	-10	-10
FREE STATE	8	-8
GAUTENG	6	-18
KWAZULU-NATAL	-10	-11
MPUMALANGA	7	-7
NORTHERN CAPE	0	-9

TABLE 2 MAIZE YIELD FORECASTS AT PROVINCIAL LEVEL

SOUTH AFRICA	Difference Yield (%)	
	All growing areas	
	11/5yrs	11/10
NORTH-WEST	20	10
WESTERN CAPE	0	-8

ZAMBIA	Difference Yield (%)	
	All growing areas	
	11/5yrs	11/10
CENTRAL	1	-5
COPPERBELT	2	4
EASTERN	1	1
LUAPULA	3	6
LUSAKA	9	4
NORTHERN	3	2
NORTH-WESTERN	4	2
SOUTHERN	8	9
WESTERN	-6	-4

ZIMBABWE	Difference Yield (%)	
	All growing areas	
	11/5yrs	11/10
HARARE	5	6
MANICALAND	-2	12
MASHONALAND CENTRAL	8	3
MASHONALAND EAST	3	9
MASHONALAND WEST	9	1
MASVINGO	-7	3
MATEBELELAND NORTH	-9	-14
MATEBELELAND SOUTH	-9	-9
MIDLANDS	-4	-5

SWAZILAND	Difference Yield (%)	
	All growing areas	
	11/5yrs	11/10
HHOHHO	1	-11
LUBOMBO	-6	-20

TABLE 2 MAIZE YIELD FORECASTS AT PROVINCIAL LEVEL

SWAZILAND	Difference Yield (%)	
	All growing areas	
	11/5yrs	11/10
SHISELWENI	-16	-27