

Foreign Agricultural Service

Global Market Analysis

International Production Assessment Division

Web: <https://ipad.fas.usda.gov>**August 11, 2023****Commodity
Intelligence
Report**

South Africa's Agricultural Sector Braces for an El Niño Drought for the Upcoming 2023/24 Crop Season

After three years of favorable weather conditions caused by a “triple-dip” La Niña, South Africa's agriculture sector braces for a possible El Niño drought which could reduce corn production in South Africa and the Southern Africa Development Community (SADC) region during the 2023/24 crop season. In June 2023, NOAA's Climate Prediction Center (CPC) issued an El Niño Advisory, noting that El Niño conditions are present in the central and eastern Pacific Ocean and are expected to gradually strengthen into the winter. El Niño's impacts on the climate extend far beyond the Pacific Ocean and have caused corn production shortfalls in South Africa during the 1972/73, 1982/83, 1991/92, 1997/98, and 2015/16 strong El Niño events (Figure 1).

El Niño is a natural climate phenomenon marked by warmer-than-average sea surface temperatures in the central and eastern Pacific Ocean near the equator, which occurs on average every 2 to 7 years. El Niño warm water events and corresponding weather anomalies can have potential crop yield impacts around the world (Figure 2). The impact on crop yields, however, depends on the timing, geographic location, and the strength of an El Niño warm water event in the Pacific. El Niño and La Niña strengths are measured by NOAA's Oceanic Niño Index (ONI). The ONI is defined by NOAA as the running 3-month mean Sea Surface Temperature (SST) anomaly for the Niño 3.4 region in the Pacific Ocean (Figure 3).

“Strong” and “Very Strong” El Niño warm water events in the Pacific's Niño 3.4 region tend to peak or reach maturity in December. Below-average rainfall and hotter conditions are expected in South Africa during El Niño years, while El Niño's maturity in December occurs in the middle of South Africa's crop season when planting ranges from October through early January and harvest ranges from April through July. The very strong 2015/16 El Niño event reduced seasonal rainfall from October 2015 through March 2016 for the SADC region, and 2016 corn output for South Africa and most SADC countries was 15 percent or more below average (Figure 4).

If the 2023/24 El Niño becomes a strong event by December, seasonal rainfall and corn production for South Africa and most SADC countries are expected to be below average and corn production deficits could be analogous to the devastating 2015/16 El Niño drought in the SADC region. Total corn production for all SADC countries during the 2015/16 El Niño drought was 26.8 mmt (15 percent below average), while the following year beneficial seasonal rains from a weak 2016/17 La Niña produced a record output

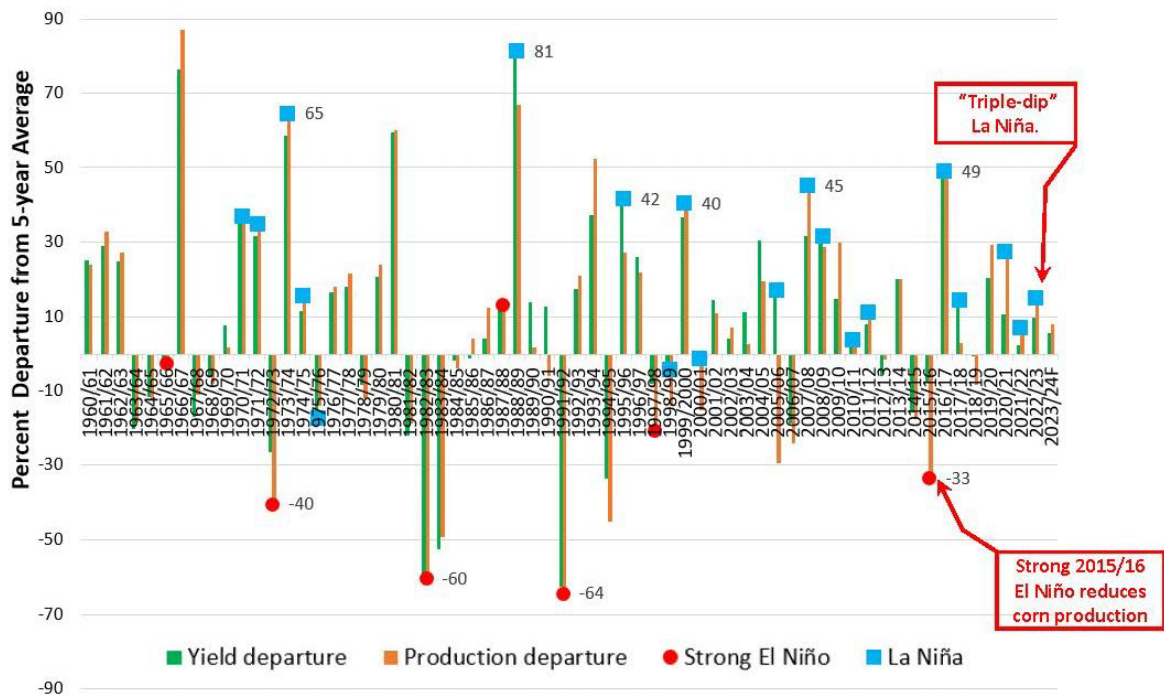
of 39.9 mmt (33 percent above average). South Africa (-2.8 mmt) and Zimbabwe (-1.3 mmt) also experienced very large corn deficits during the 2015/16 El Niño drought, and their 2016 corn import requirements nearly exceeded Durban's port capacity of approximately 4 mmt of grain per year (Figure 5).

Strong and very strong El Niño events have caused corn production deficits for South Africa and the SADC region since the 1970s (Figure 6). The World Food Program reported the 2015/16 El Niño drought affected 32 million people living in the SADC region, and it also globally affected 60 million people who required humanitarian food assistance (Figure 7).

South Africa partially mitigated the 2015/16 corn production shortfall by increasing irrigated corn area to a record 25 percent of total corn area (Figure 8). Similarly, irrigated corn area for the 2023/24 crop could be larger than last year even though electrical power shortages and load-shedding challenges have raised irrigation costs during the past several years. But farmers are still expected to plant more irrigated corn area in October this year because recent ONI measurements indicate an increased likelihood of an upcoming El Niño drought around December.

In summary, USDA forecasts South Africa's 2023/24 corn production at 16.8 million metric tons (mmt), down 0.2 million (1 percent) from the previous year, but up 1.25 mmt (8 percent) from the 5-year average. Corn area is forecasted at 3.0 million hectares, unchanged from the previous year. Yield is forecasted at a trend yield of 5.6 tons per hectare, up 6 percent from the 5-year average. It should be noted that USDA's 10-year trend yield forecast assumes normal weather for the upcoming 2023/24 South Africa crop season, and USDA will adjust its 2023/24 yield forecast after actual weather anomalies, insect infestations, fertilizer leaching, etc. indicate potential trend yields have been impacted (Figure 9).

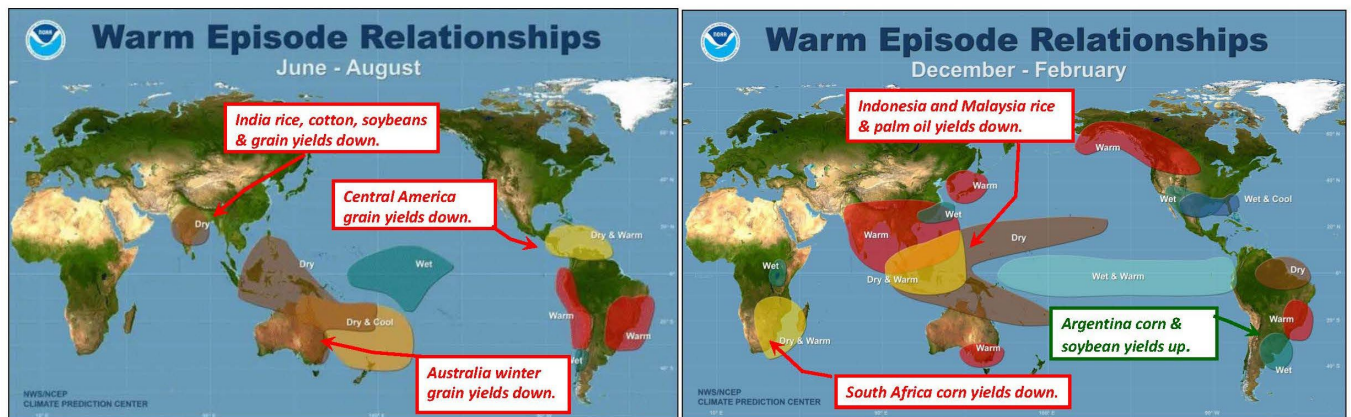
South Africa Corn Yield and Production Departures from 5-year Average



Sources: Production and yield departures from USDA PSD Online; and El Niño/La Niña years defined by the Oceanic Niño Index (ONI) from NOAA-CPC

Figure 1. South Africa Corn Yield and Production Departures from 5-year Average

Typical El Niño Weather Anomalies and Impact on Global Crop Yields

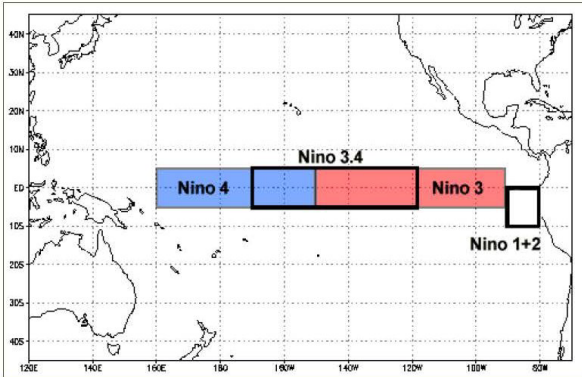


Sources: Crop Yield Impacts from FAS/GMA/IPAD; and El Niño Weather Anomalies from NOAA’s Climate Prediction Center (CPC)

Figure 2. Typical El Niño Anomalies and Impact on Global Crop Yields

Niño 3.4 Region in Eastern Pacific Ocean

Historical El Niño and La Niña Strength Based on Oceanic Niño Index (ONI) Measurements

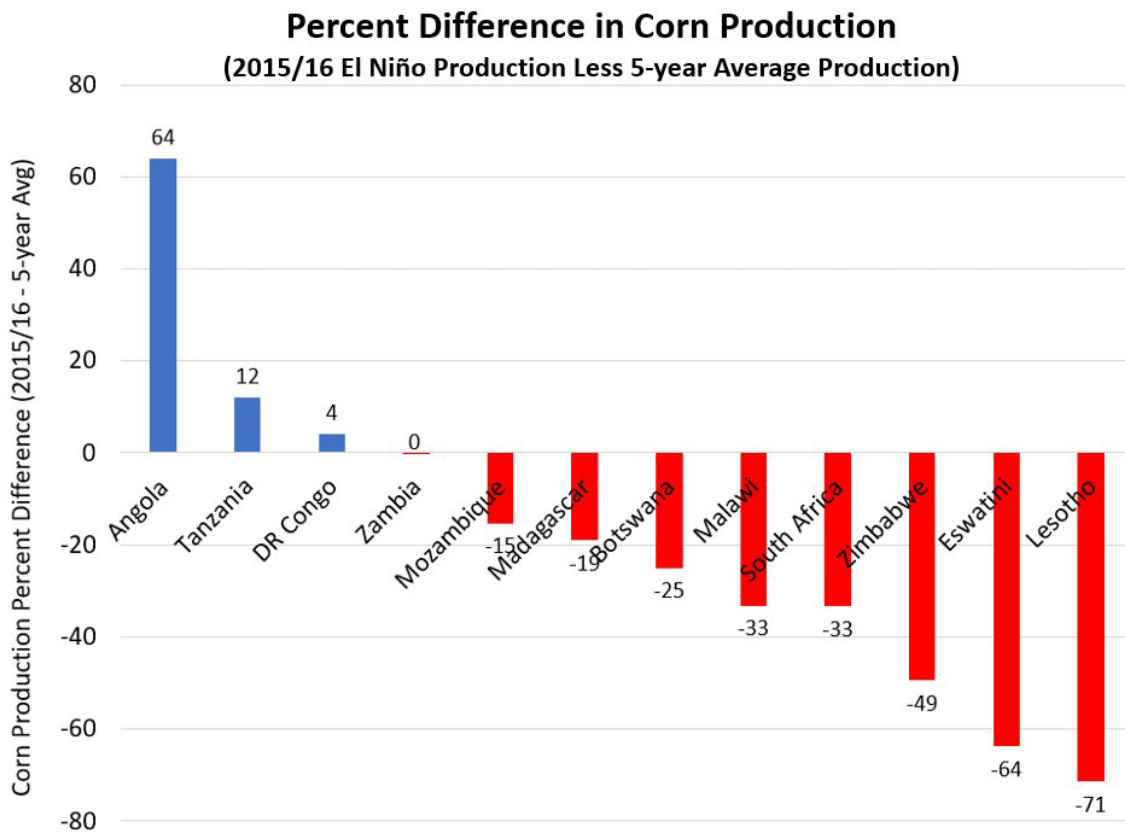


El Niño - 26				La Niña - 23		
Weak - 11	Moderate - 7	Strong - 5	Very Strong - 3	Weak - 11	Moderate - 5	Strong - 7
1952-53	1951-52	1957-58	1982-83	1954-55	1955-56	1973-74
1953-54	1963-64	1965-66	1997-98	1964-65	1970-71	1975-76
1958-59	1968-69	1972-73	2015-16	1971-72	1995-96	1988-89
1969-70	1986-87	1987-88		1974-75	2011-12	1998-99
1976-77	1994-95	1991-92		1983-84	2020-21	1999-00
1977-78	2002-03			1984-85		2007-08
1979-80	2009-10			2000-01		2010-11
2004-05				2005-06		
2006-07				2008-09		
2014-15				2016-17		
2018-19				2017-18		

Oceanic Niño Index (ONI) is defined as the 3-month running-mean sea surface temperature departures in the **Niño 3.4 region** (5°S-5°N, 170°W-120°W).

Sources: Oceanic Niño Index (ONI) from NOAA’s Climate Prediction Center (CPC)

Figure 3. Oceanic Niño Index (ONI) Measures the Strength of El Niño and La Niña Events



Source: PSD Online

Figure 4. Percent Difference in Corn Production during the 2015/16 El Niño

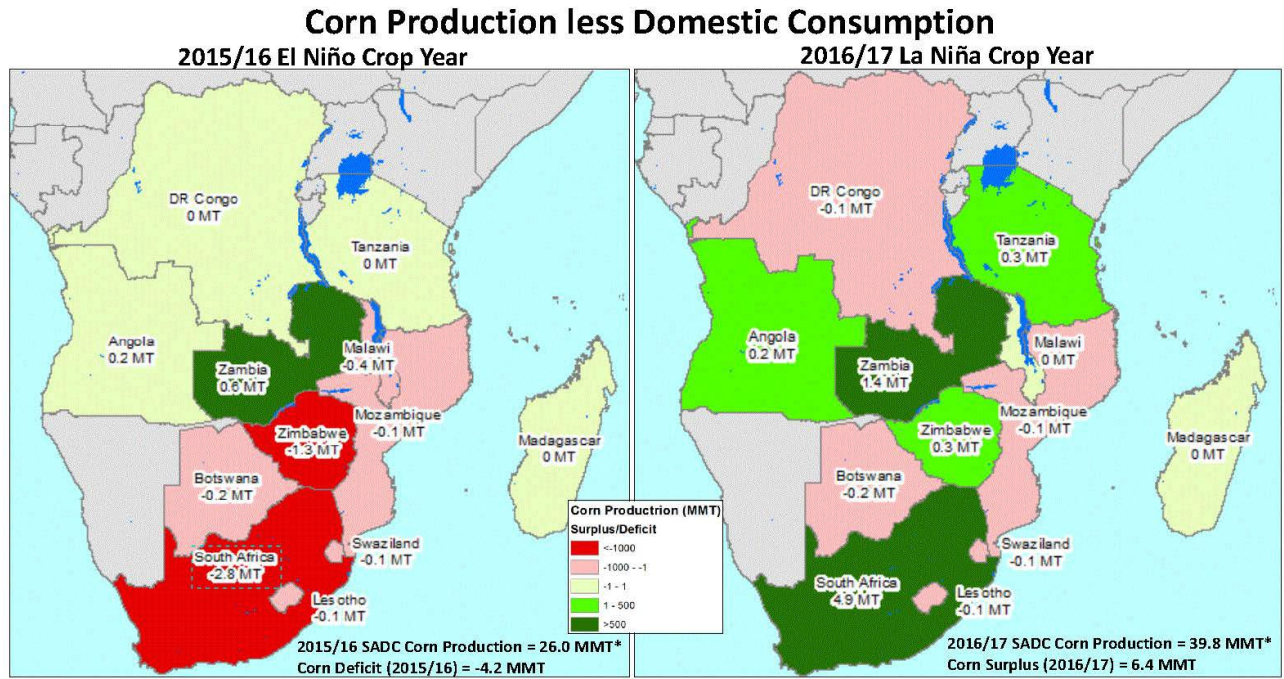


Figure 5. Corn Production less Domestic Consumption

Surplus and Deficit Corn Production for South Africa and SADC Countries

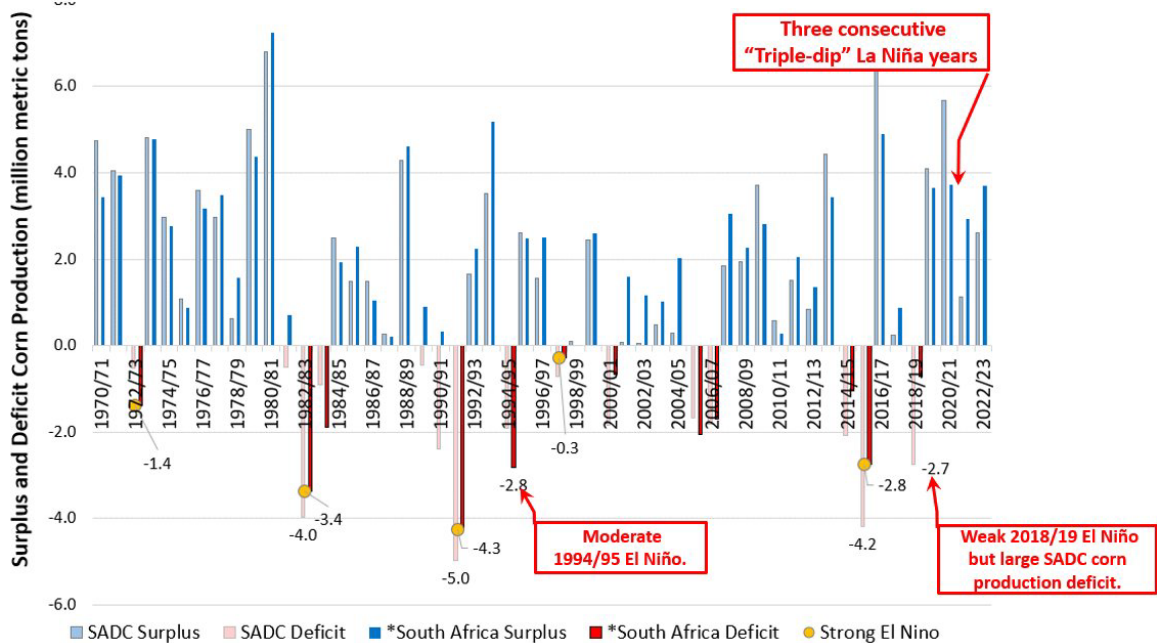
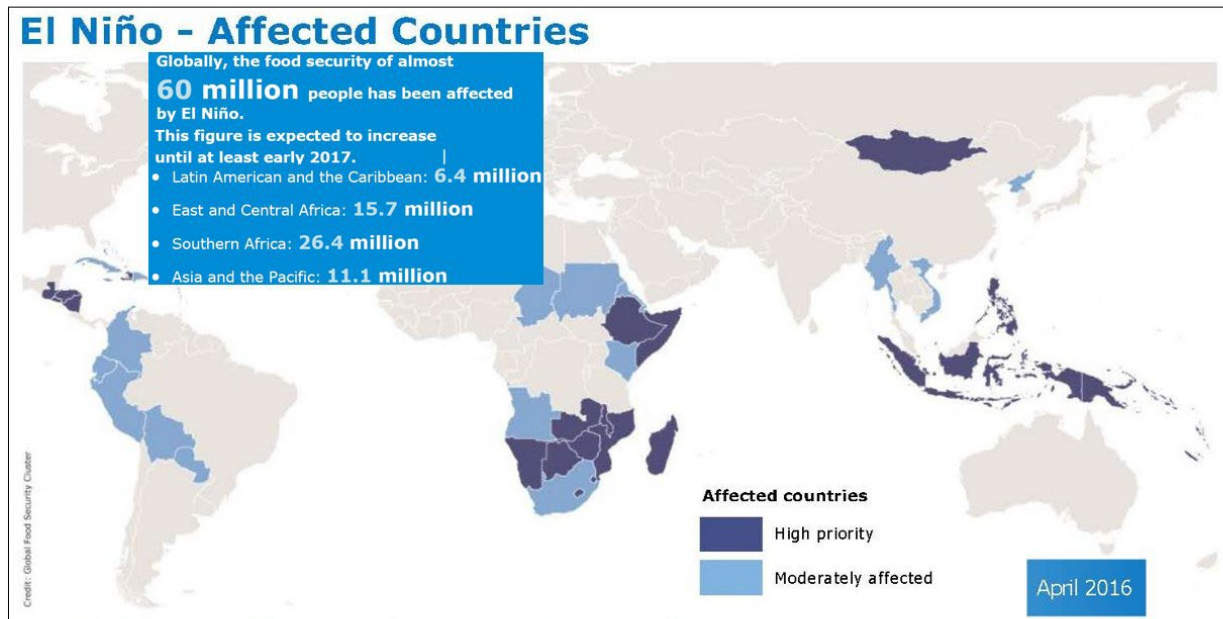


Figure 6. Surplus and Deficit Corn Production for South Africa and SADC Countries

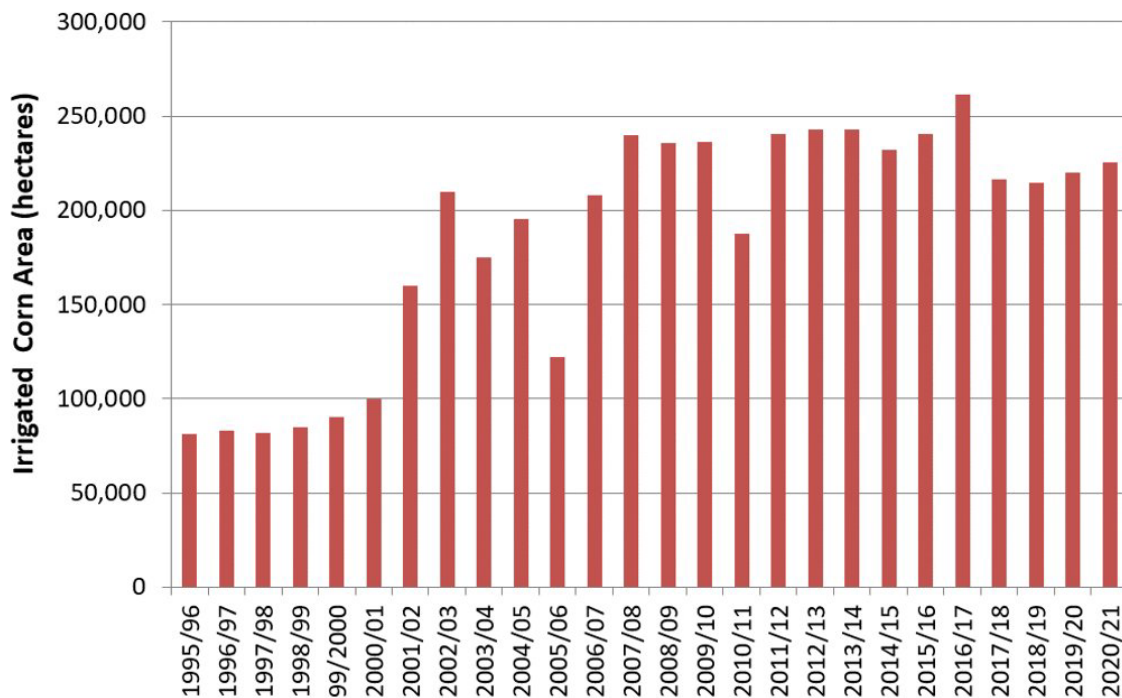
Very Strong 2015/16 El Niño Affects 60 Million People Globally



Source: World Food Program (WFP), 2016- El Niño and Food Security, April 2016; <https://www.wfp.org/publications/2016-el-ni%C3%B1o-and-food-security>

Figure 7. Very Strong 2015/16/ El Niño Affects 60 Million People Globally

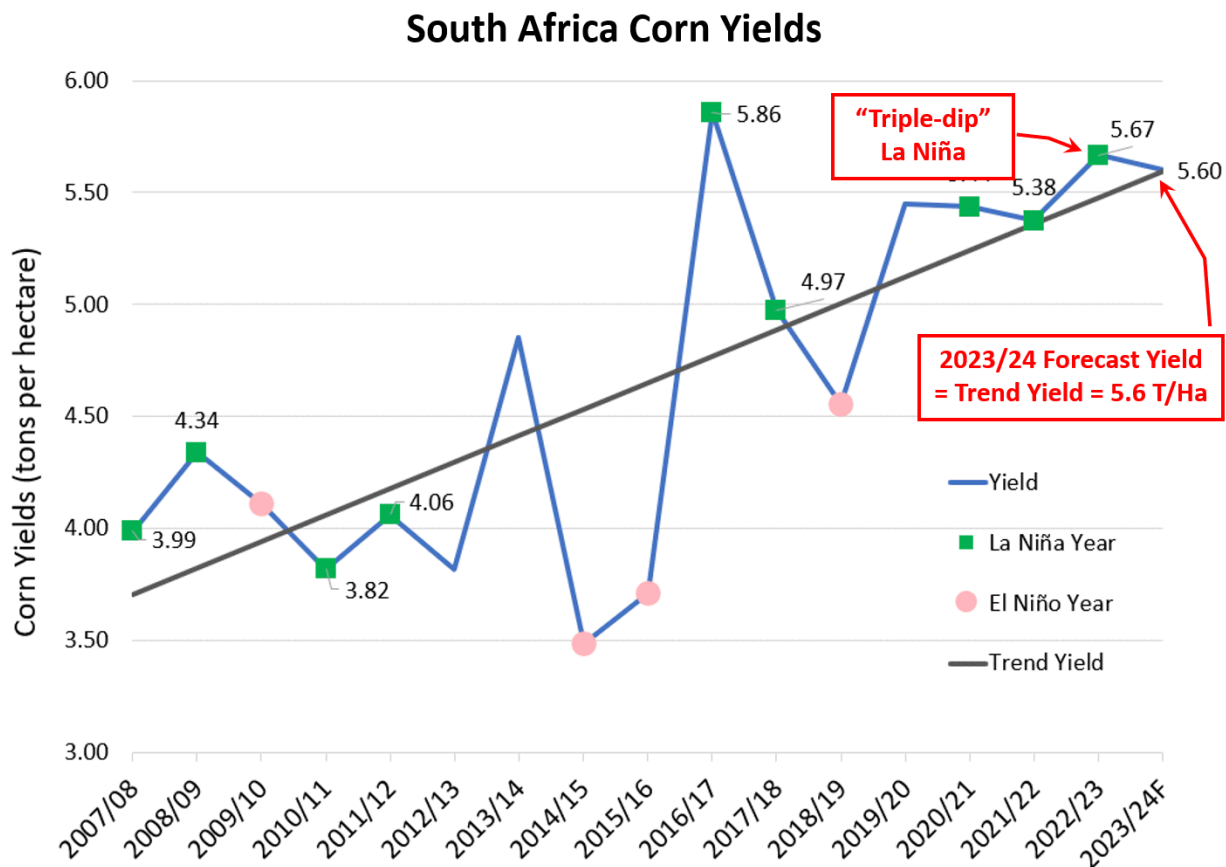
Irrigated Corn Area in South Africa



Source: South Africa Department of Agriculture, Forestry and Fisheries; Trends in the Agricultural Sector.

Note: On average (2016-2020), irrigated white corn area is 5% of white corn area and irrigated yellow corn area is 14% of yellow corn area.

Figure 8. Irrigated Corn Area in South Africa



Sources: Corn yields from USDA PSD Online; and
La Niña and El Niño years defined by NOAA's Oceanic Niño Index (ONI)

Figure 9. South Africa Corn Yields

Previous FAS Commodity Intelligence Reports (CIR) about El Niño Impacts on South Africa Corn Production

[South Africa Corn: Favorable Production Prospects from Beneficial La Niña Rains during Planting Season for MY 2021/22](https://ipad.fas.usda.gov/highlights/2022/02/SouthAfrica/index.pdf) - February 9, 2022

<https://ipad.fas.usda.gov/highlights/2022/02/SouthAfrica/index.pdf>

[El Niño Impacts on 2015/16 Crop Yields](https://ipad.fas.usda.gov/highlights/2016/06/southafrica/index.htm) -June 24, 2016

<https://ipad.fas.usda.gov/highlights/2016/06/southafrica/index.htm>

[El Niño Drought Reduces 2015/16 Corn Prospects in South Africa](https://ipad.fas.usda.gov/highlights/2016/05/SouthAfricaElNiño/index.htm) -May 26 2016

<https://ipad.fas.usda.gov/highlights/2016/05/SouthAfricaElNiño/index.htm>

[Drought Delays 2015/16 Corn Planting in South Africa](https://ipad.fas.usda.gov/highlights/2015/11/RSA/index.htm#:~:text= Sparse%20rainfall%20during%20Oct ober%20and, and%20eastern%20Free%20State%20provinces.) -November 19, 2015

<https://ipad.fas.usda.gov/highlights/2015/11/RSA/index.htm#:~:text= Sparse%20rainfall%20during%20Oct ober%20and, and%20eastern%20Free%20State%20provinces.>

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Current World Agricultural Production Reports

<https://www.fas.usda.gov/data/world-agricultural-production>

Production, Supply and Distribution Database (PSD Online)

<https://apps.fas.usda.gov/psdonline/app/index.html#/app/home>

Global Agricultural Information Network (Agricultural Attaché Reports)

<https://www.fas.usda.gov/databases/global-agricultural-information-network-gain>

Crop Explorer

<https://ipad.fas.usda.gov/cropexplorer/>

Global Agricultural Monitoring System (GLAM)

<https://glam1.gsfc.nasa.gov/>

Global Agricultural and Disaster Assessment System (GADAS)

<https://geo.fas.usda.gov/GADAS/index.html>