

The Need for International Weather Data and Related Products at the U.S. Department of Agriculture

Presented to

CoCoRaHS

Weather Talk Webinar Series

February 26, 2015

WASDE Report



World Agricultural Supply and Demand Estimates

United States Department of Agriculture

Office of the Chief Economist

Agricultural Marketing Service Farm Service Agency

Economic Research Service Foreign Agricultural Service

WASDE - 510

Approved by the World Agricultural Outlook Board

September 12, 2012

WHEAT: The 2012/13 U.S. wheat balance sheet is unchanged this month; however, small by-class adjustments are made to projected exports and stocks. Projected exports for Hard Red Winter wheat are lowered 25 million bushels with Hard Red Spring and White wheat exports raised 15 million bushels and 10 million bushels, respectively. Corresponding changes are made to projected ending stocks for these three classes. The projected price is lowered to \$7.50 to \$8.70 per bushel compared to the summer months, when prices remained well below cash bids and futures prices reported earlier in the year.

Global wheat supplies for 2012/13 are projected lower than last month. An increase in foreign beginning stocks partly offsets the projected 4.1-million-ton reduction in world wheat output. Beginning stocks are raised for Canada and Egypt, but lowered for Argentina. Production for Russia is reduced 4.0 million tons with lower reported area and reduced yields as harvest results confirm additional drought and heat damage to both the winter and spring wheat crops. Production is also lowered 0.5 million tons for adjoining Kazakhstan, which experienced the same adverse drought and heat during July and August that affected spring wheat in the central and eastern growing regions of Russia. EU-27 production is lowered 0.5 million tons mostly reflecting lower expected yields in the United Kingdom. Ukraine production is raised 0.5 million tons based on higher reported yields. Production for Afghanistan is raised 0.4 million tons mostly on higher reported area.

Global wheat consumption for 2012/13 is lowered slightly from last month. Residual use in Russia and Kazakhstan. Food use is lowered 0.5 million tons with additional reductions projected for food use in Egypt, Afghanistan, Iran, and Libya.

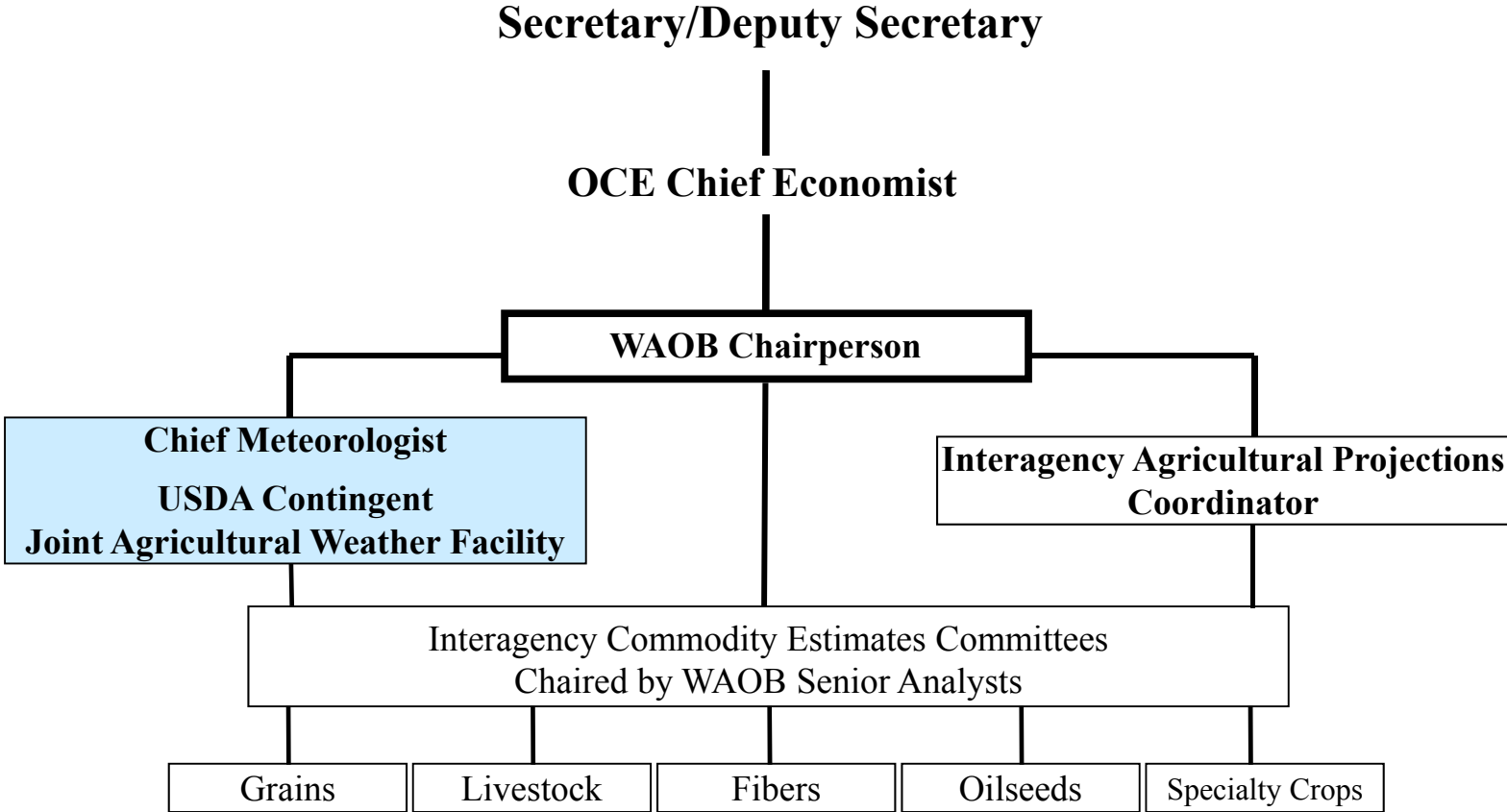
Global wheat trade for 2012/13 is lowered slightly from last month. EU-27, Israel, and Nigeria. Import increases for EU-27, Israel, and Nigeria. Exports are reduced 2.0 million tons for Ukraine. Exports are reduced 2.0 million tons for Ukraine. Government officials and grain traders to limit shipments to domestic supplies. Higher expected exports for EU-27, Israel, and Nigeria. Ukraine reduction.

World ending stocks for 2012/13 are projected 0.5 million tons lower with changes to a number of countries. The largest declines in stocks are for Russia, EU-27, China, Brazil, and Argentina. The largest increases are for Ukraine, Canada, Iran, and Turkey.

COARSE GRAINS: U.S. feed grain supplies for 2012/13 are projected higher this month with a reduction in forecast corn production more than offset by higher projected corn carryin. U.S. corn production is lowered 52 million bushels with the national average yield forecast 0.6 bushels per acre lower at 122.8 bushels. Lower yields and production in the Corn Belt and Central Plains are partly

Global wheat supplies for 2012/13 are projected 3.1 million tons lower mostly due to lower expected production in Russia. An increase in foreign beginning stocks partly offsets the projected 4.1-million-ton reduction in world wheat output. Beginning stocks are raised for Canada and Egypt, but lowered for Argentina. Production for Russia is reduced 4.0 million tons with lower reported area and reduced yields as harvest results confirm additional drought and heat damage to both the winter and spring wheat crops. Production is also lowered 0.5 million tons for adjoining Kazakhstan, which experienced the same adverse drought and heat during July and August that affected spring wheat in the central and eastern growing regions of Russia. EU-27 production is lowered 0.5 million tons mostly reflecting lower expected yields in the United Kingdom. Ukraine production is raised 0.5 million tons based on higher reported yields. Production for Afghanistan is raised 0.4 million tons mostly on higher reported area.

USDA Situation and Outlook Organizational Structure



USDA/JAWF'S Main Responsibilities

- Routinely collect **global agricultural weather information** to determine the cumulative impact of growing season weather conditions on crops and livestock production prospects;
- Provide information on weather-related agricultural developments to the Office of the Chief Economist and the Secretary of Agriculture;
- Publish the *Weekly Weather and Crop Bulletin*; and
- Provide crop-weather assessments for WAOB's monthly World Agricultural Supply and Demand Estimates (WASDE) lockup report.



U.S. Dept. of Commerce

**National Oceanic &
Atmospheric Administration**

Climate Prediction Center (CPC)

National Weather Service/
National Centers for Environmental
Prediction

Global Weather Data



U.S. Dept. of Agriculture

**Office of the Chief
Economist**

**National Agricultural
Statistics Service**

**World Agricultural
Outlook Board**

**Agricultural
Statistics Board**

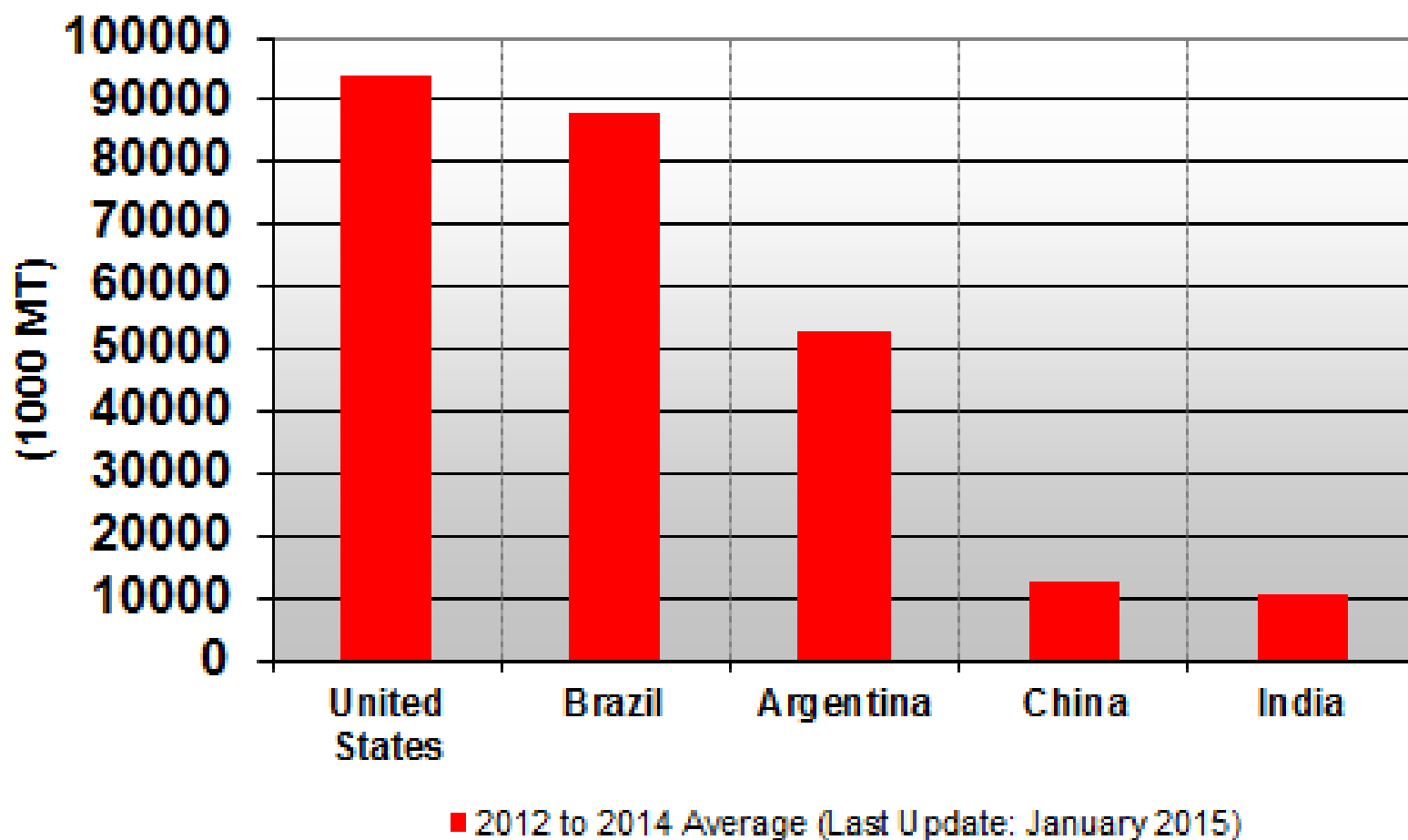
**International
Crop
Information**



**Domestic
Crop
Statistics**

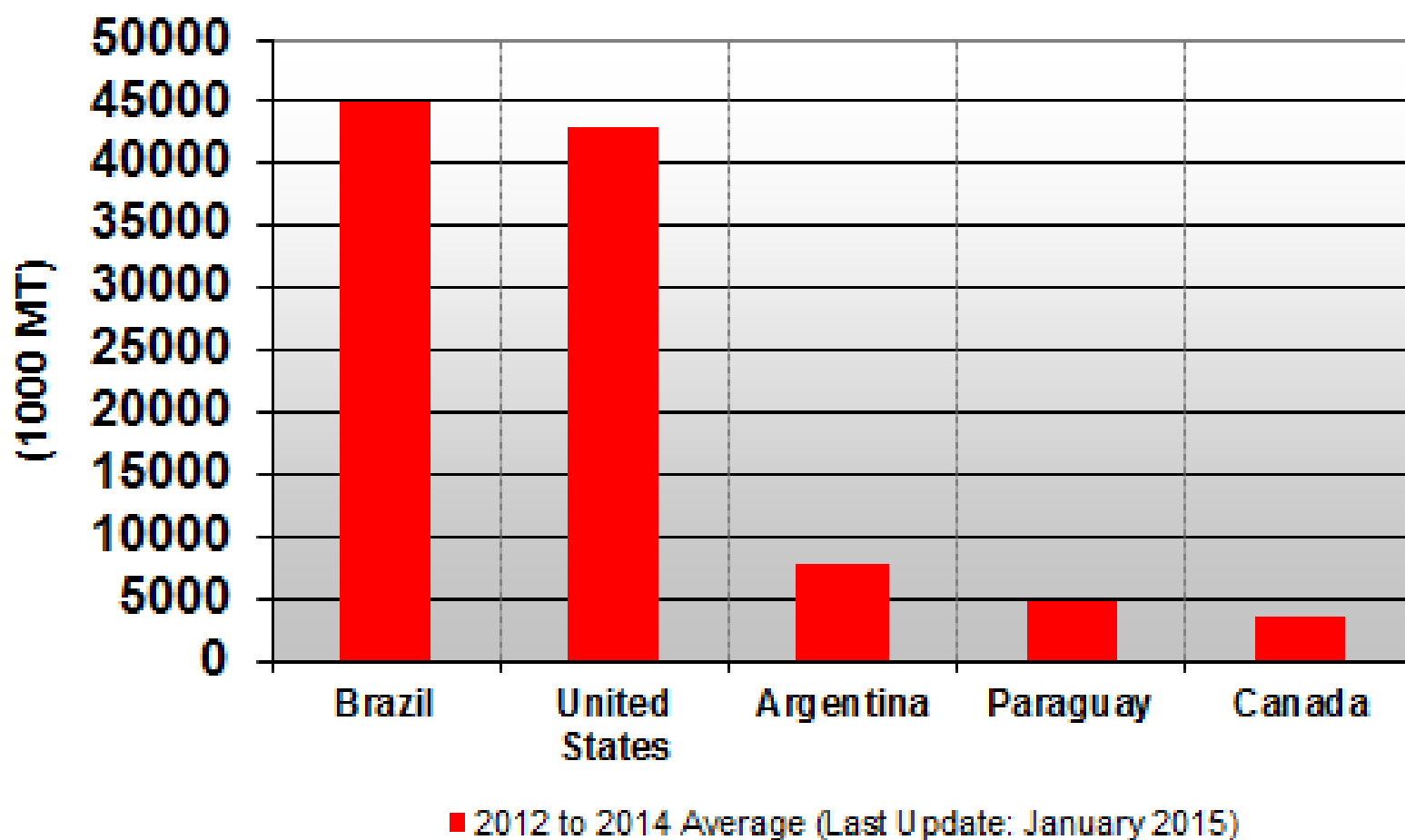


Oilseed, Soybean Production



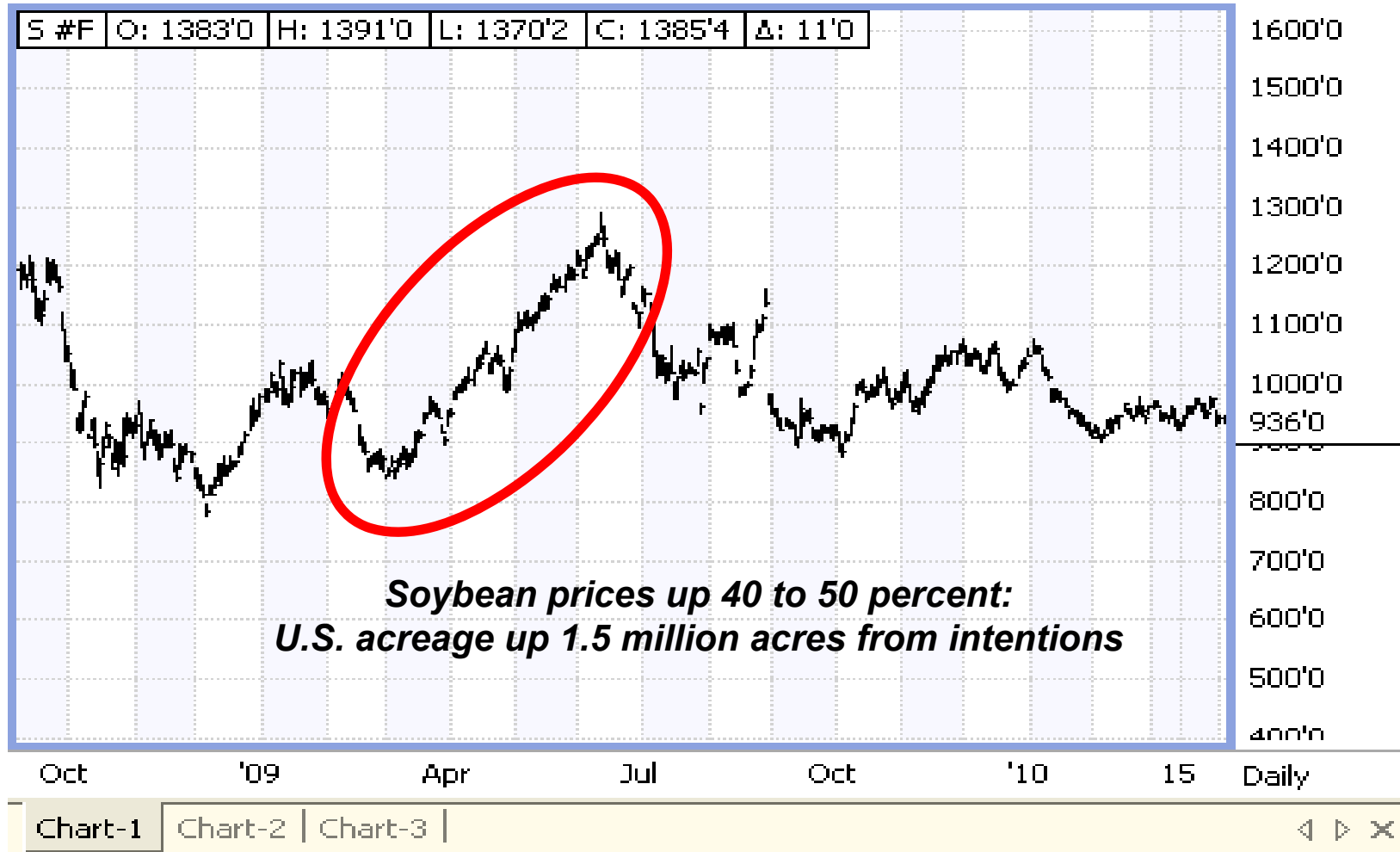
Source: USDA

Oilseed, Soybean Exports



Source: USDA

Price Impact of 2008 Argentina Drought



Sampling of Press Report Headlines - February 2015

Soaking rains to benefit Brazil coffee, sugar cane, grain crops - RTRS

Rain fosters soy and corn crops in Argentina -meteorologist - RTRS

Higher-than-normal temperature in north China favorable for wintering of wheat - XINHUN

Hailstorm damages upto 20% wheat crops in Shahkot, Nakodar - HINDUT

UPDATE 1-Cyclone threatens over 10 pct of Australian sugarcane -industry body - RTRS

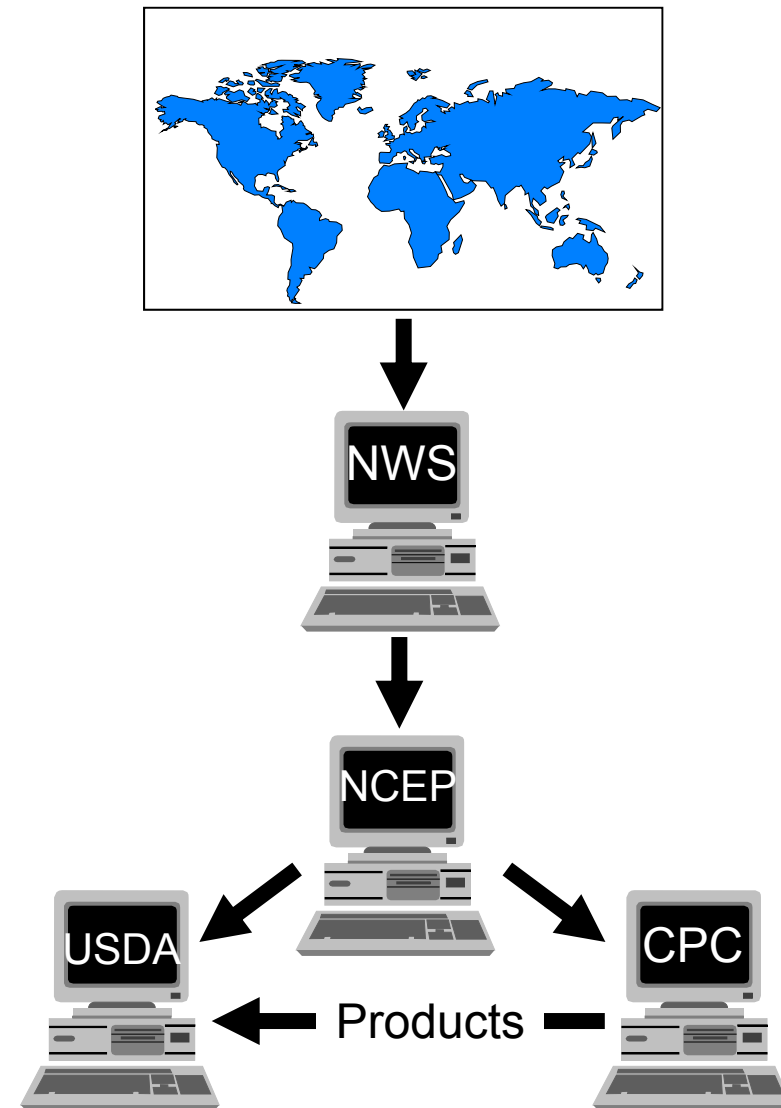
23-Feb-2015 11:05 - MOROCCO COULD HARVEST RECORD CEREAL CROP ABOVE 10 MLN TONNES THIS YEAR AFTER FAVOURABLE RAINS - FARM MINISTRY OFFICIAL

+ many others regarding weather impacts in other parts of the world

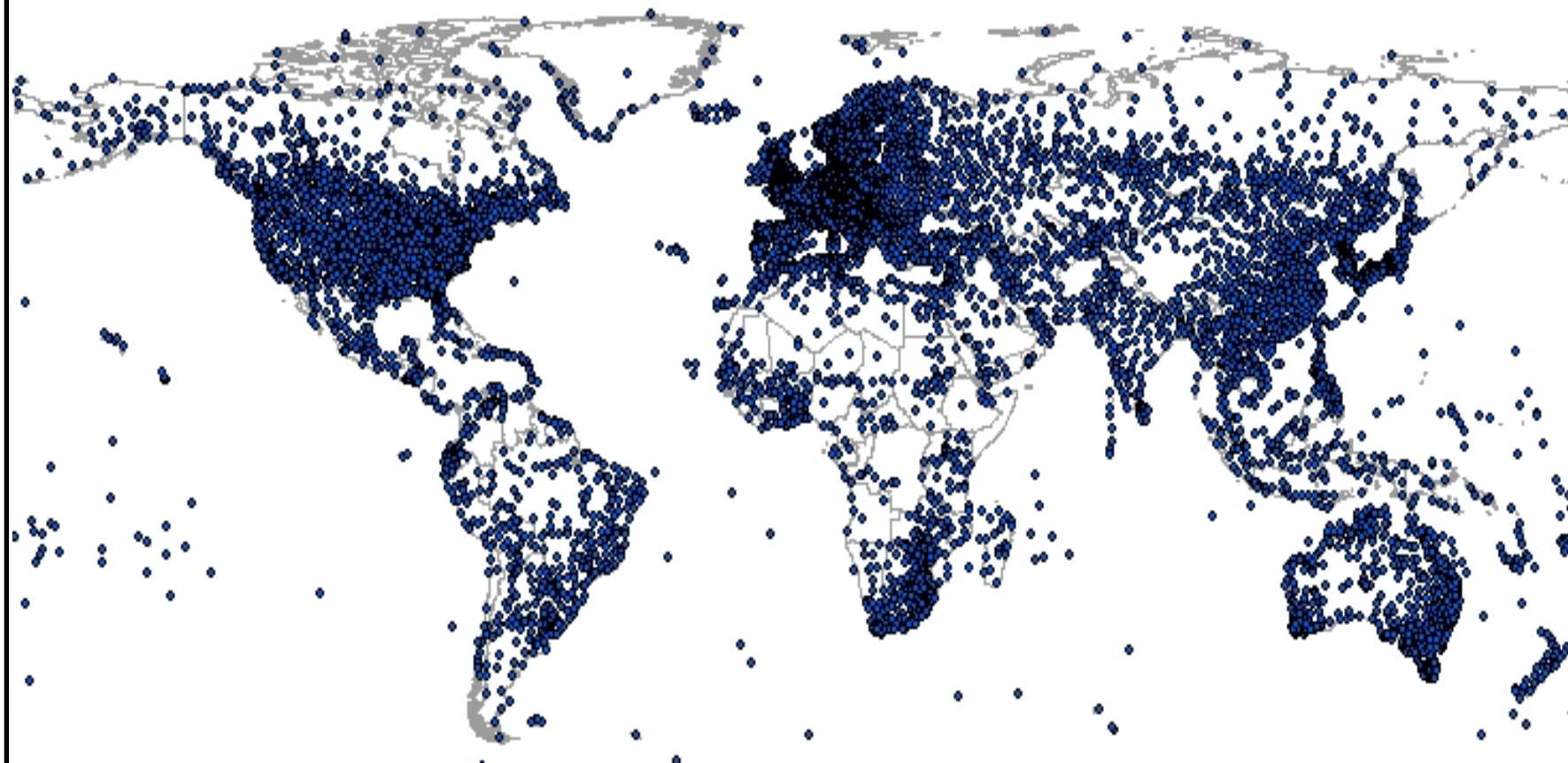
Weather Data

WMO Synoptic and Metar Observations

- Weather has a significant impact on crop development from pre-planting to harvesting.
- Weather events must be closely monitored in all crop areas as each crop is affected differently by heat, drought and other weather and climate extremes during the growing season.



*** Random sampling of available daily weather data**



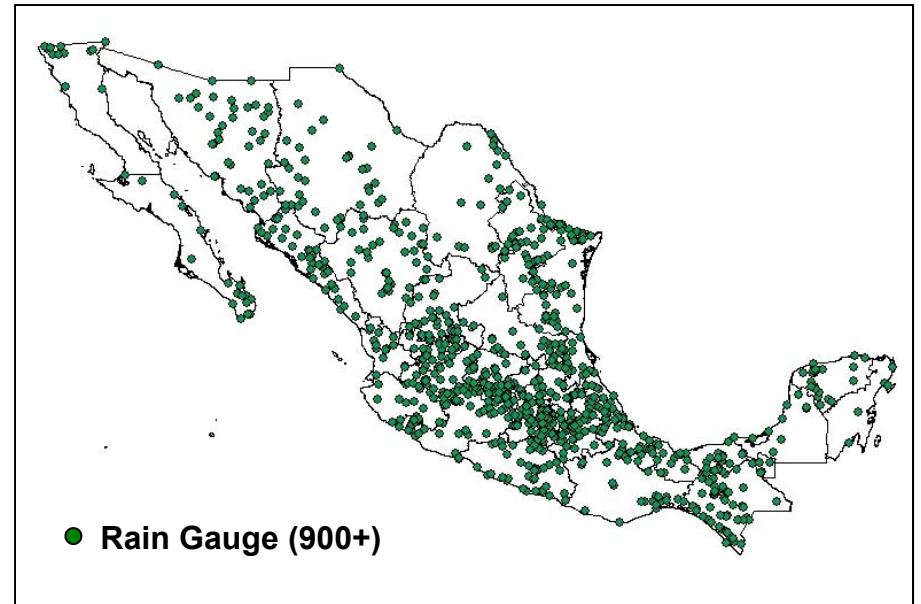
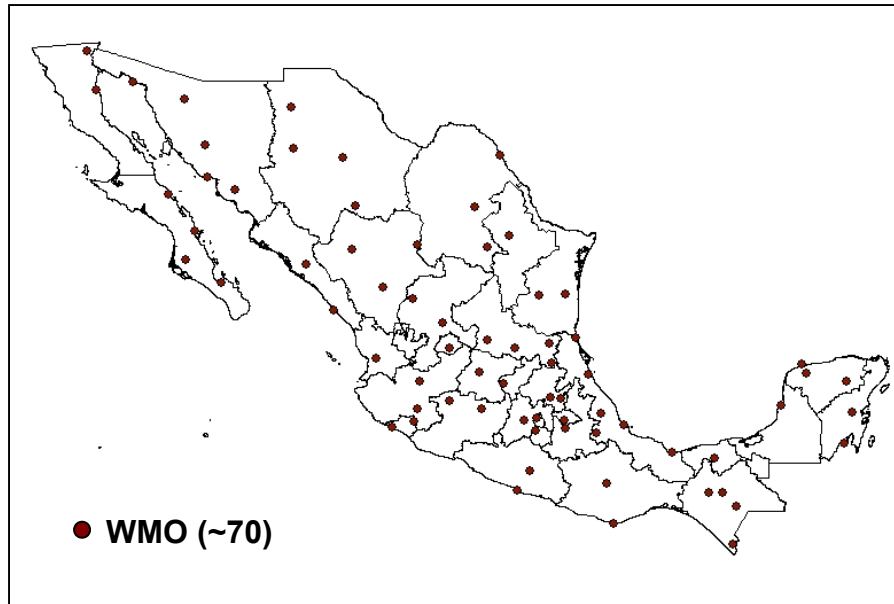
*** Most have data since at least 1982
(many with normals)**

 **Location of weather stations
received daily via the WMO¹**

¹ United Nations World Meteorological Organization

Data, Products, and Services (in support of WAOB/JAWF)

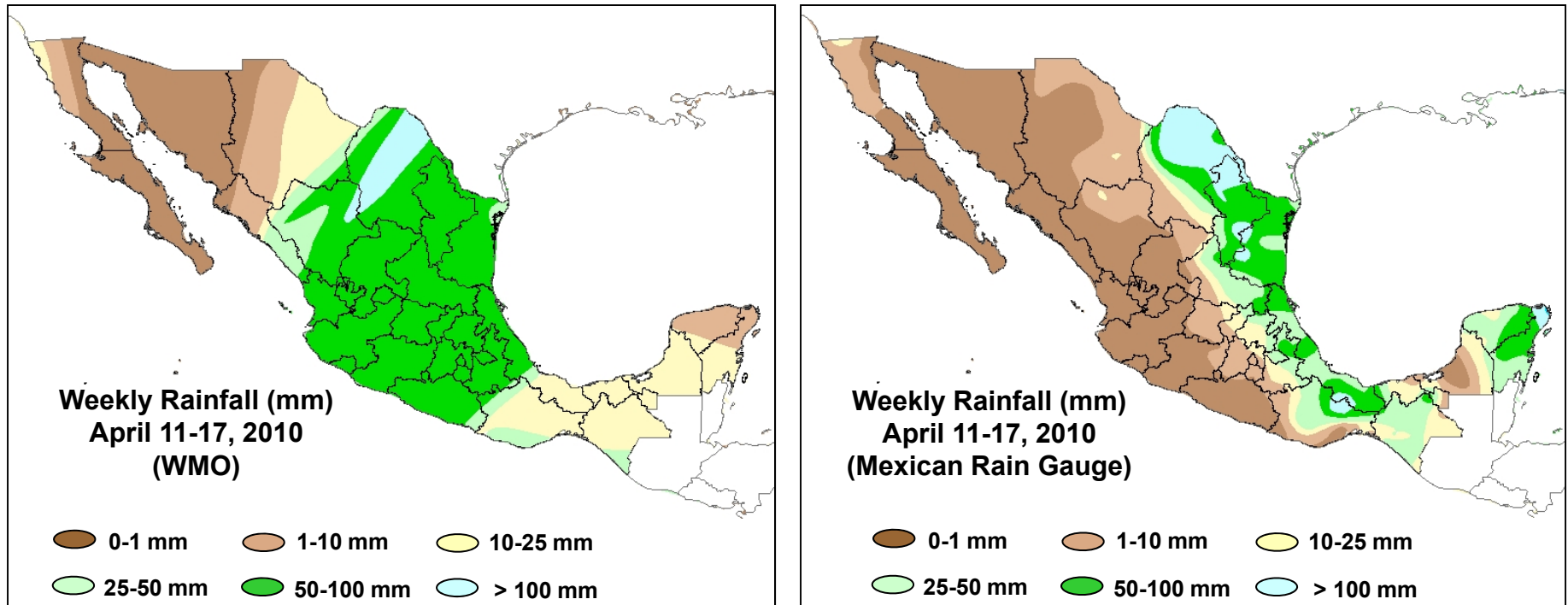
Secondary sources of weather data



Data obtained by CPC from the Mexican weather bureau are incorporated into the weekly rainfall chart created for the *Weekly Weather and Crop Bulletin* and are provided separately to USDA analysts for their analysis of crop weather impacts.

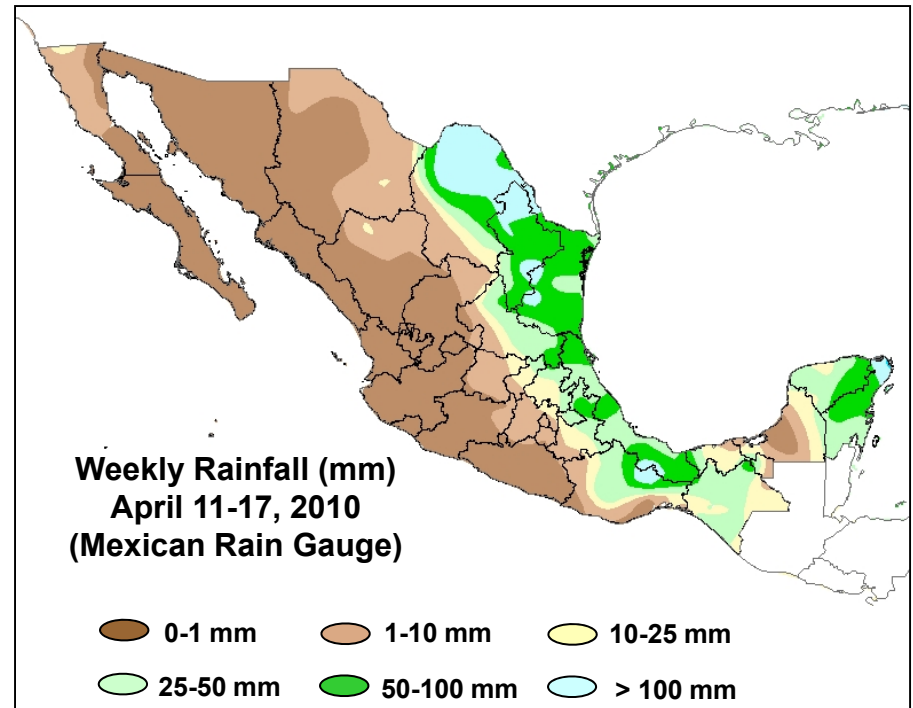
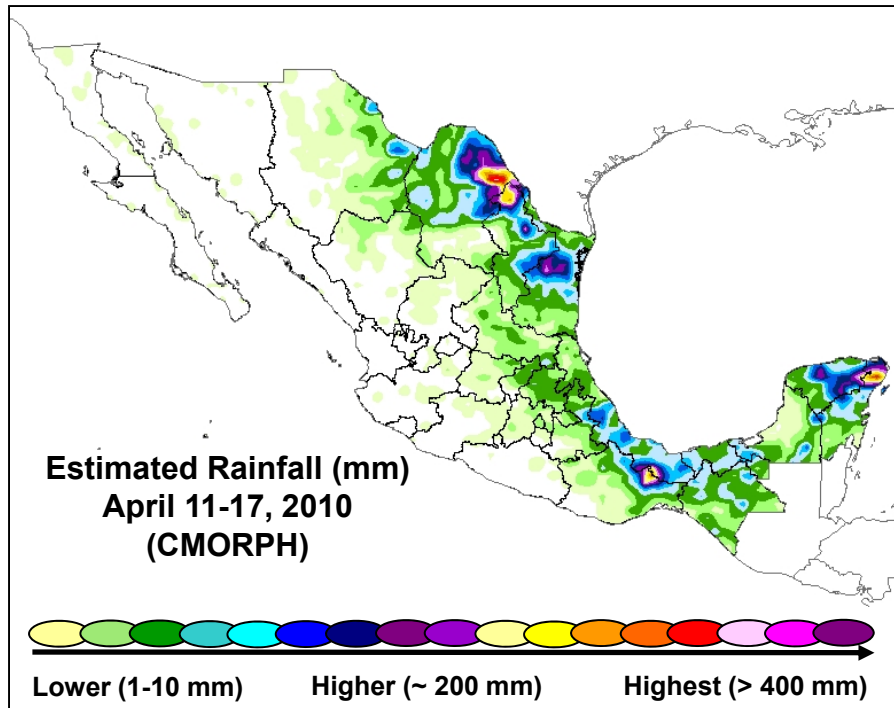
Data, Products, and Services (in support of WAOB/JAWF)

Secondary sources of weather data

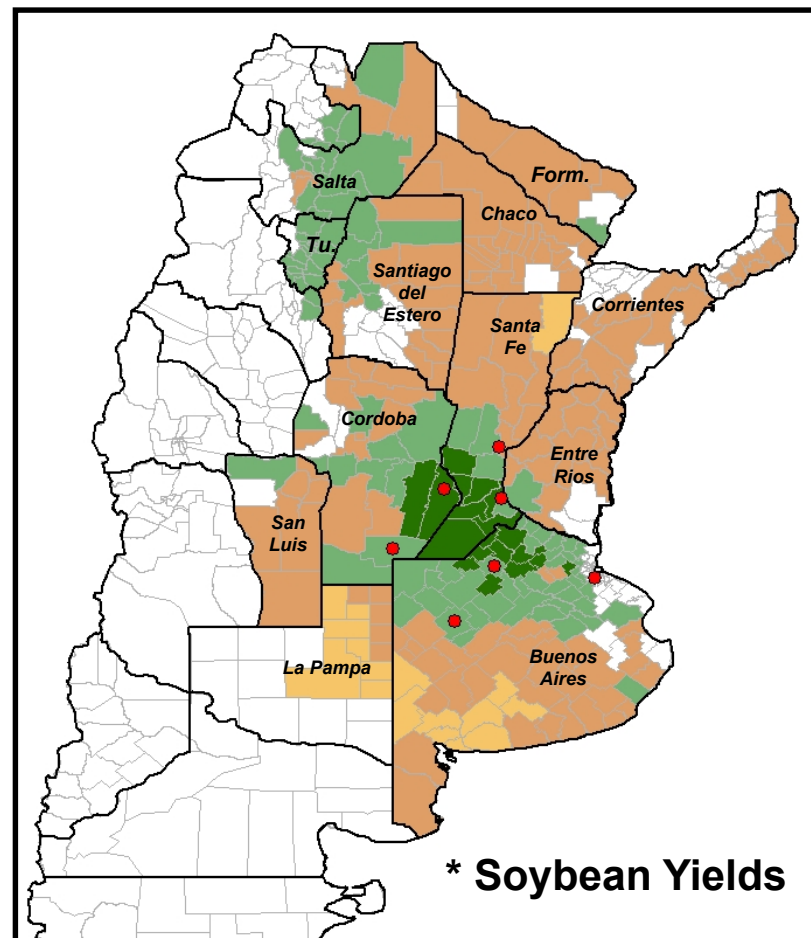
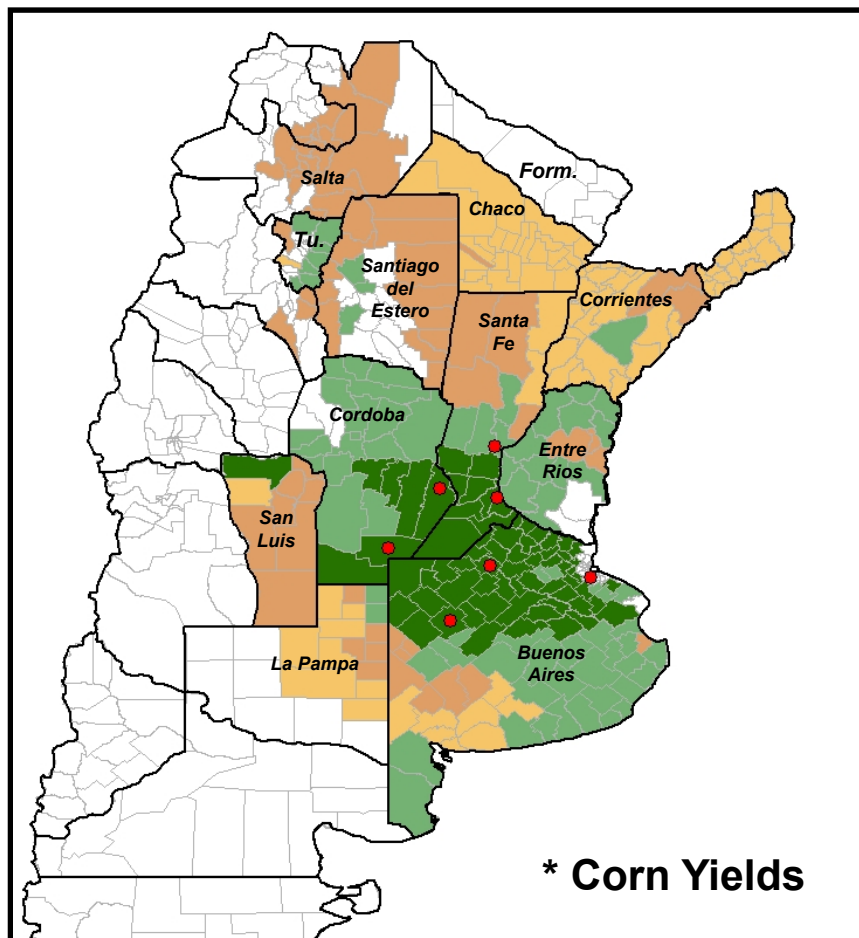


The maps above highlight the differences that arise using WMO data, which are sparse in coverage, versus the supplemental rain gauge data, which provides a denser network of stations and a better representation of rainfall.

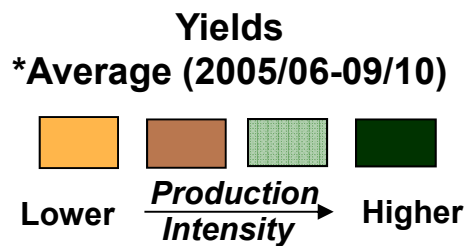
Data, Products, and Services (in support of WAOB/JAWF) Validation using existing GIS products



Comparison with other sources of information, including satellite derived estimates (CMORPH), support the rain gauge analysis.



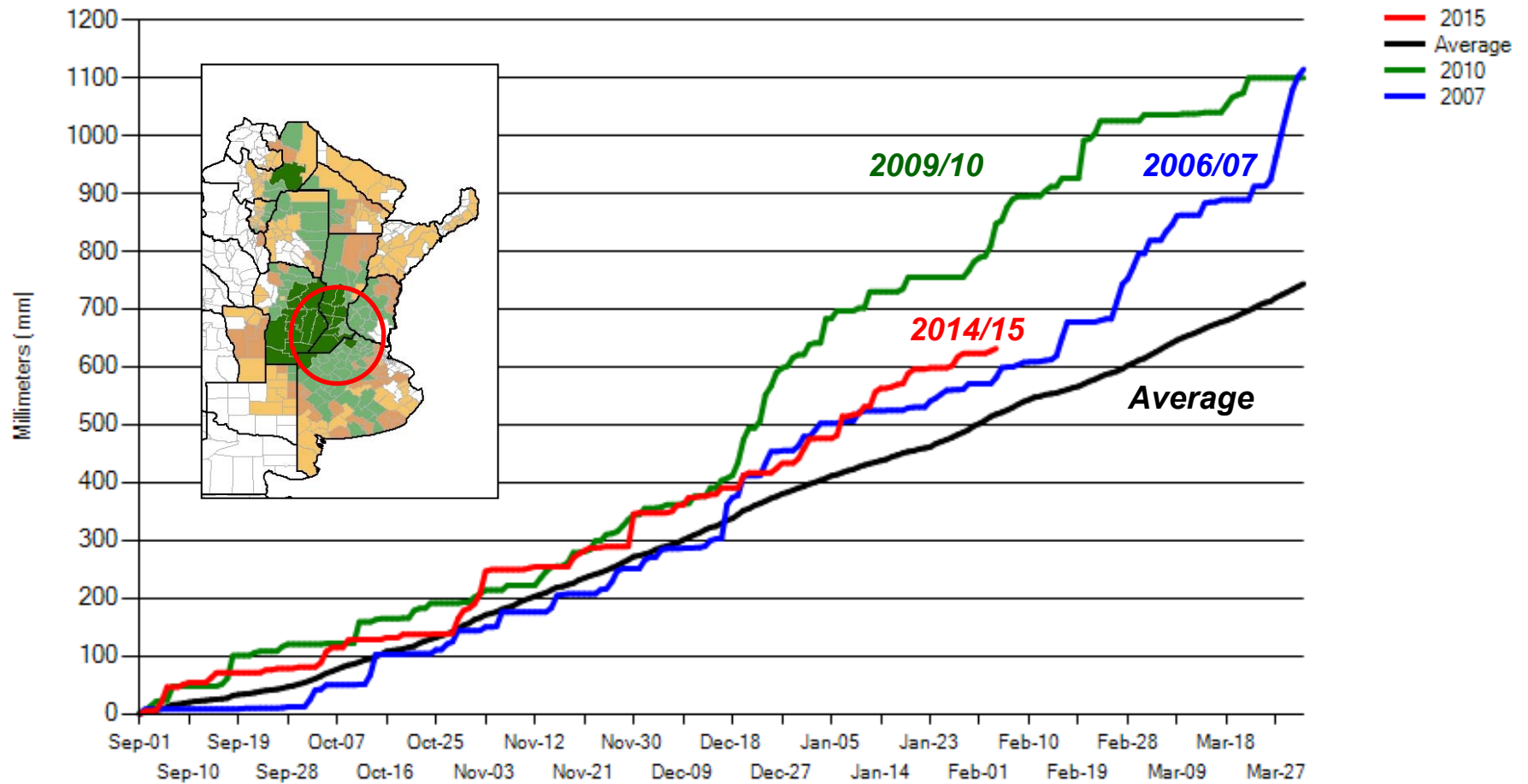
● Stations in "Main Crop Area"



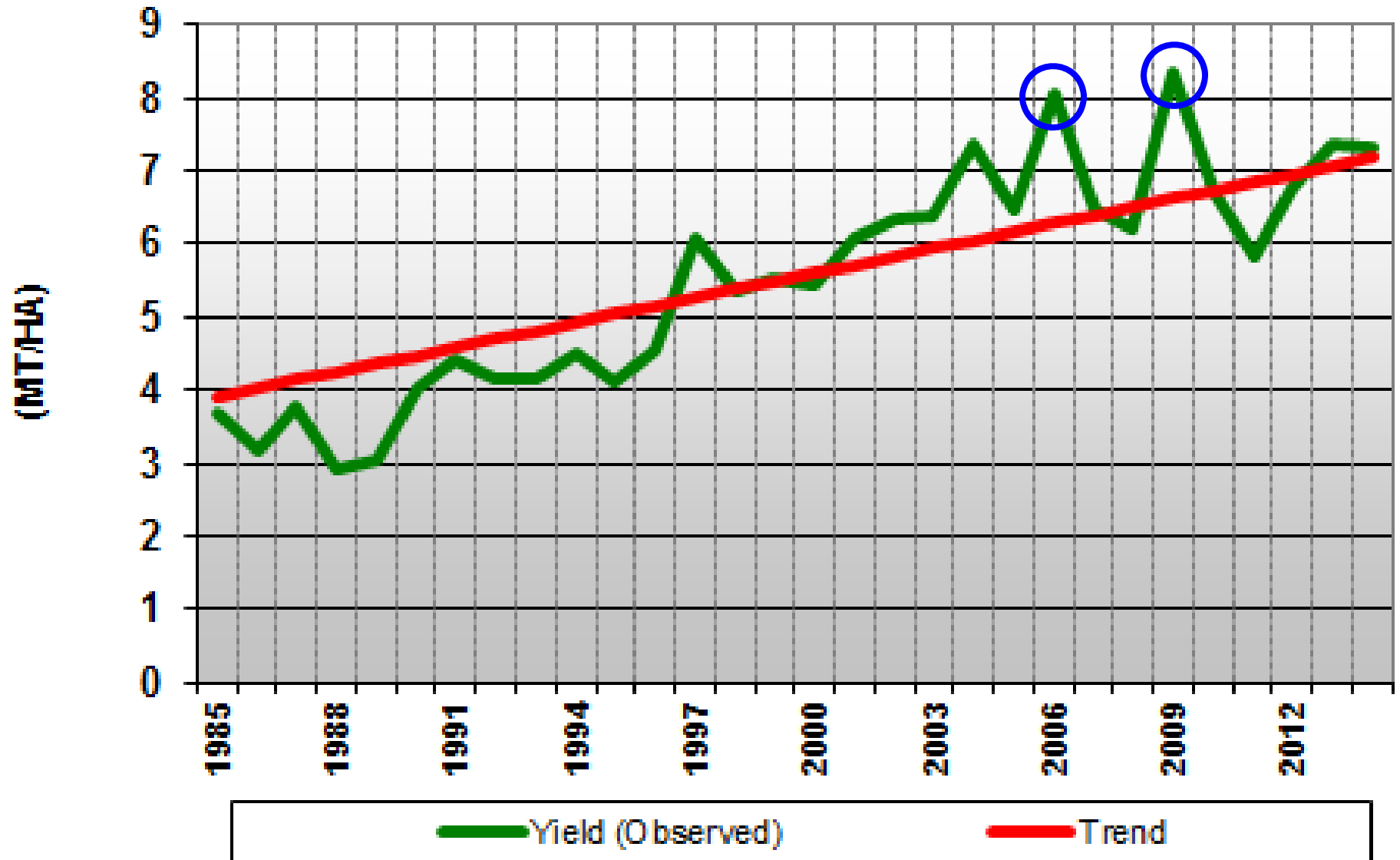
*Source: SAGPyA

6 - MAIN CROP AREA

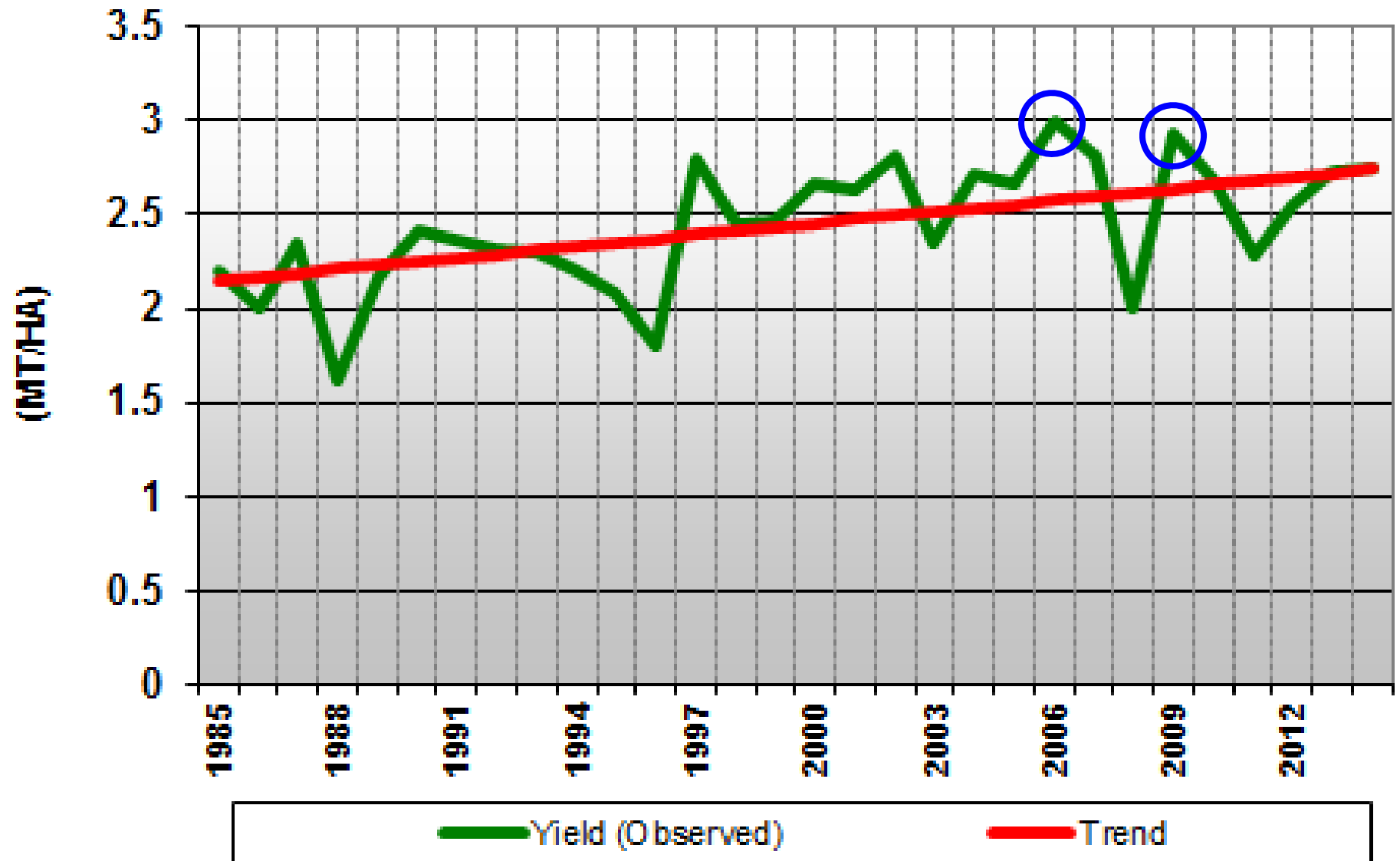
Cumulative Precipitation



Argentina: Corn

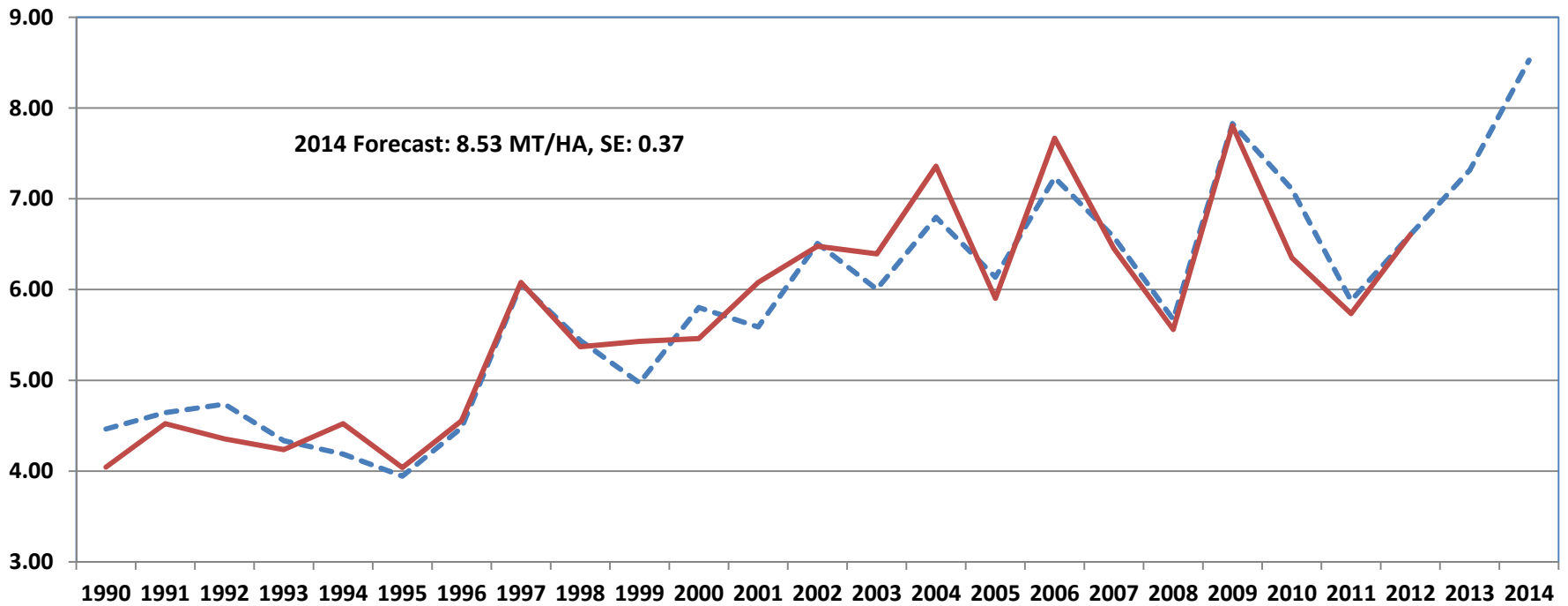


Argentina: Oilseed, Soybean



MT/HA

Argentina Corn Yield Actual vs. Forecast

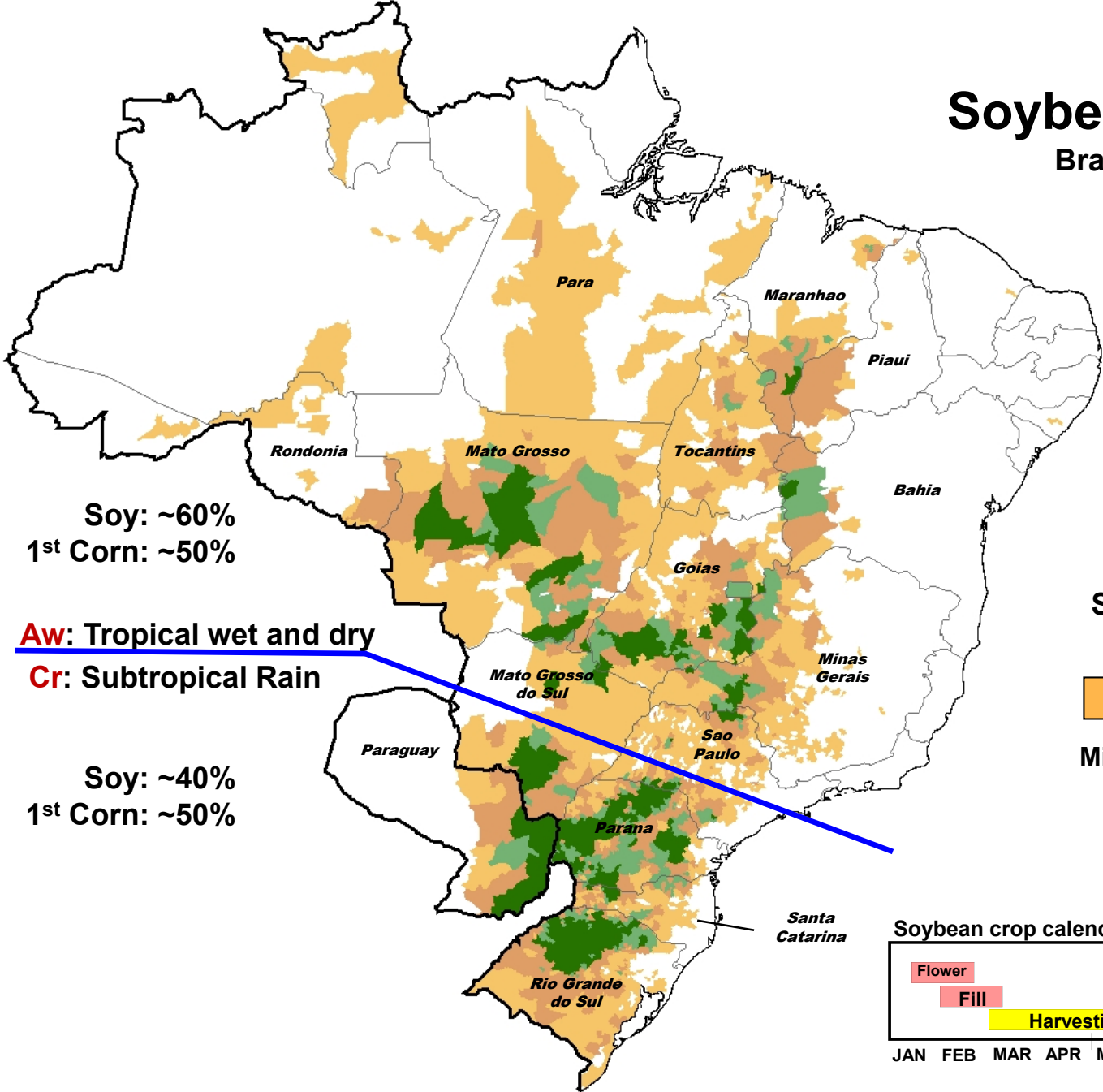


--- Fcst — Actual MinAg Yield

Min Ag Yield $f(\text{trend}, 2012 \text{ Dummy}, \text{Dec-Jan Avg Temp}, \text{Dec-Jan Total Pcp}, \text{Dec-Jan Total Pcp}^2)$

Soybean Production

Brazil and Paraguay



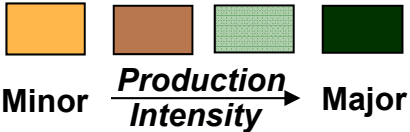
Soy: ~60%
1st Corn: ~50%

Aw: Tropical wet and dry
Cr: Subtropical Rain

Soy: ~40%
1st Corn: ~50%

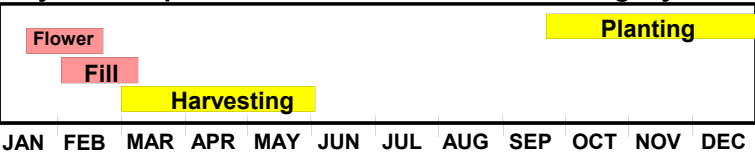
Soybean Production

*Average (2005-09)

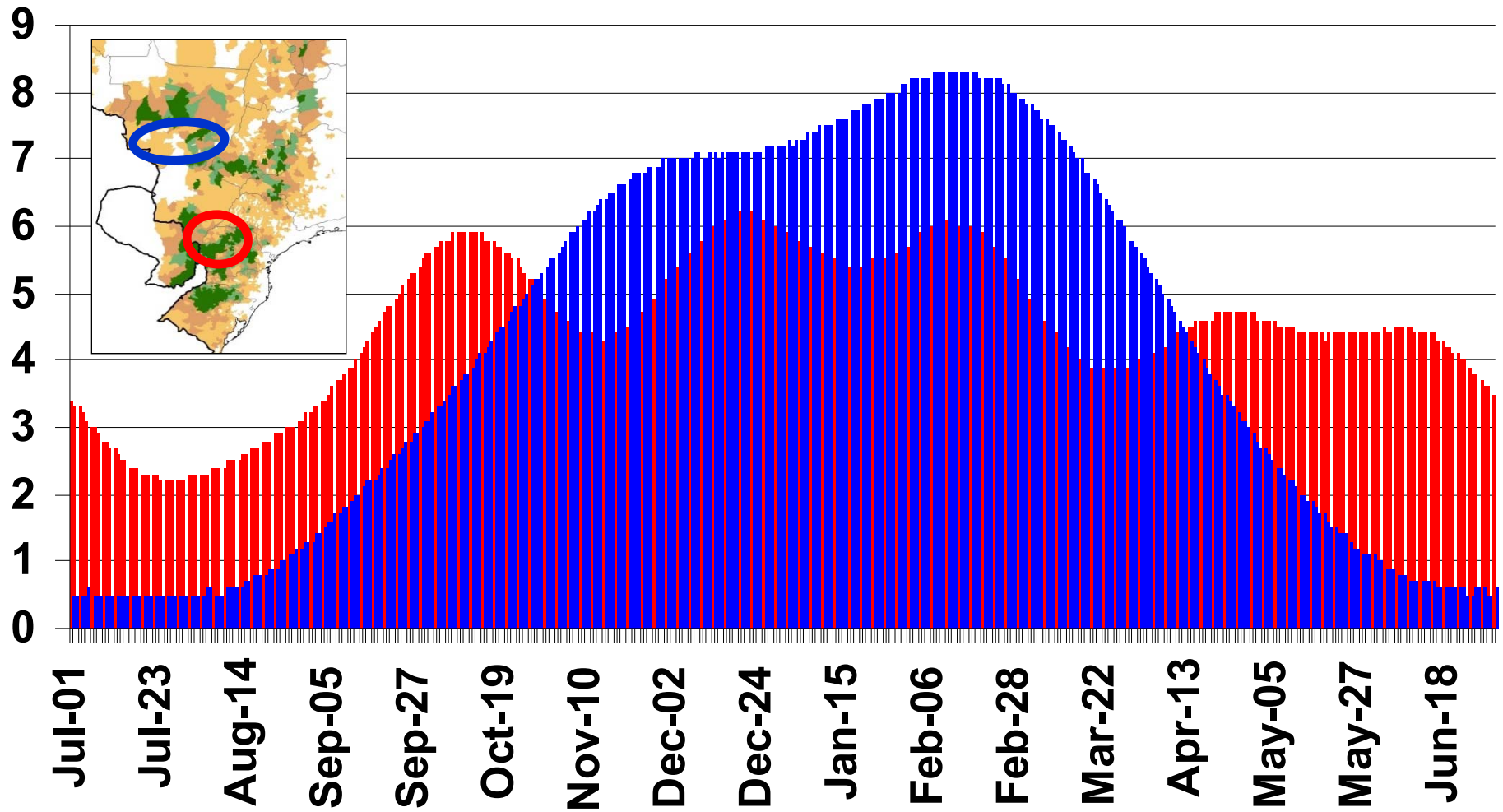


*Source: MINAG / IBGE

Soybean crop calendar for most of Brazil & Paraguay



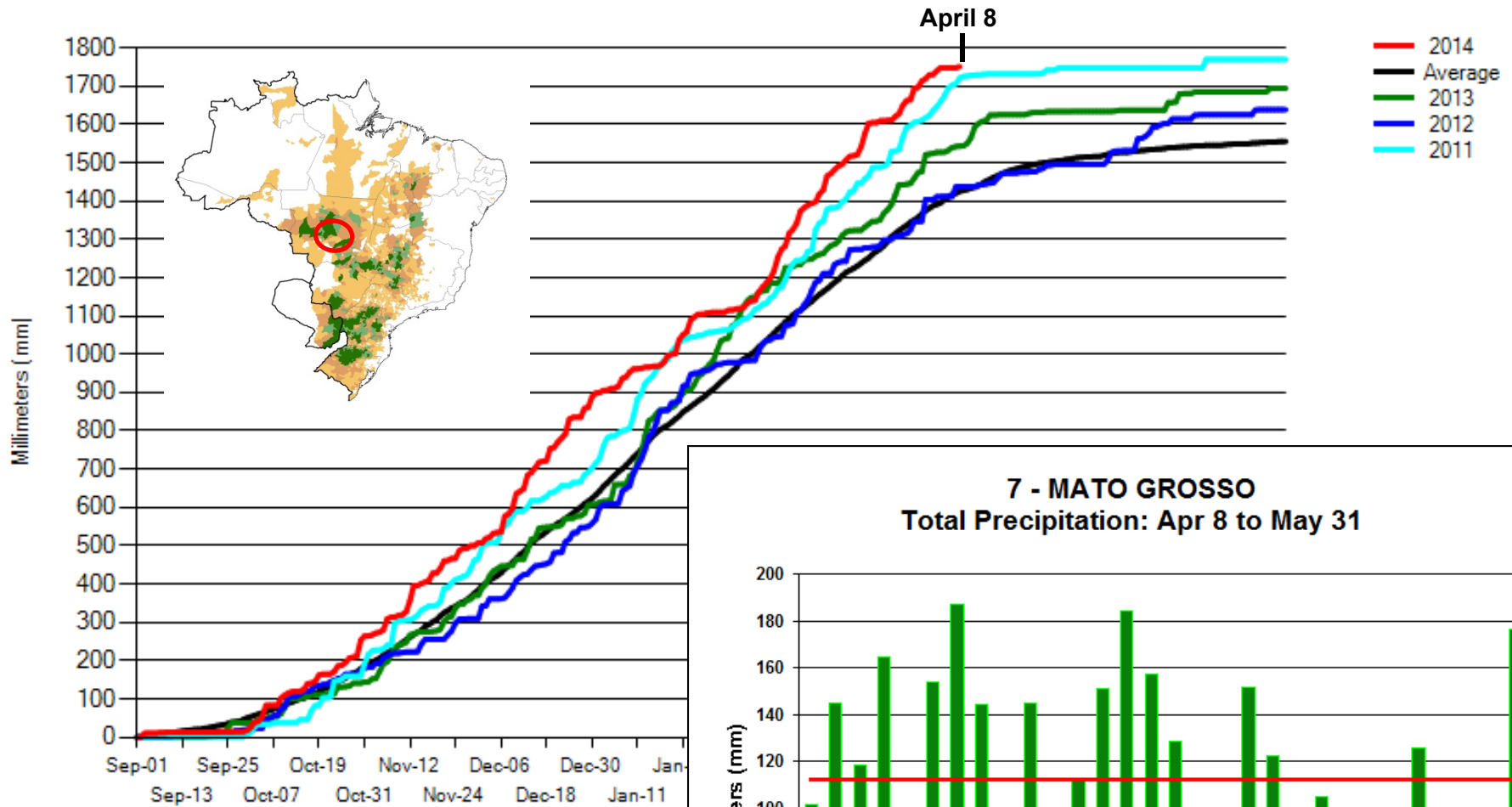
Brazil: Normal Daily Rainfall (mm)



■ Parana ■ MT

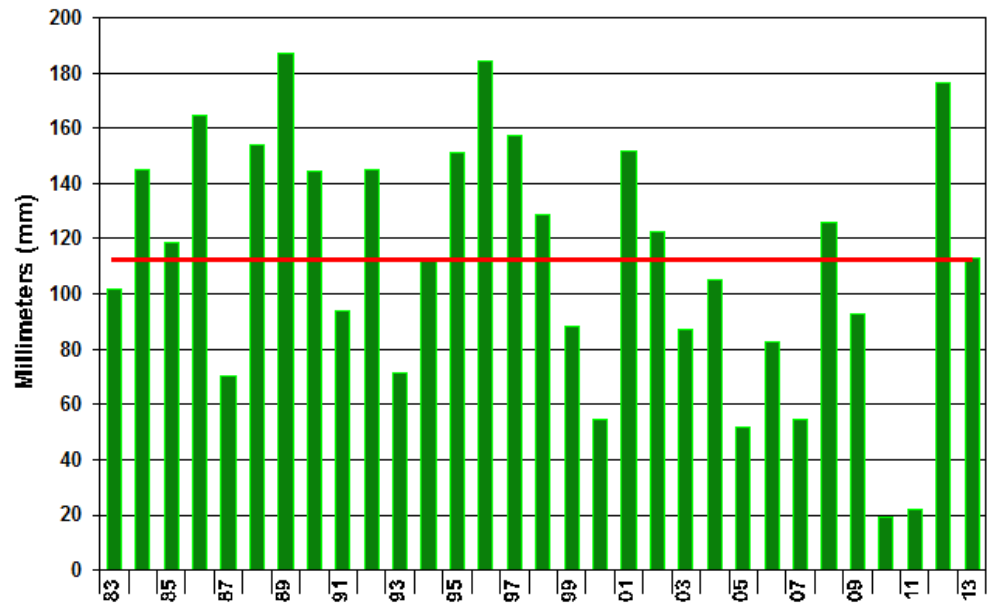
7 - MATO GROSSO

Cumulative Precipitation



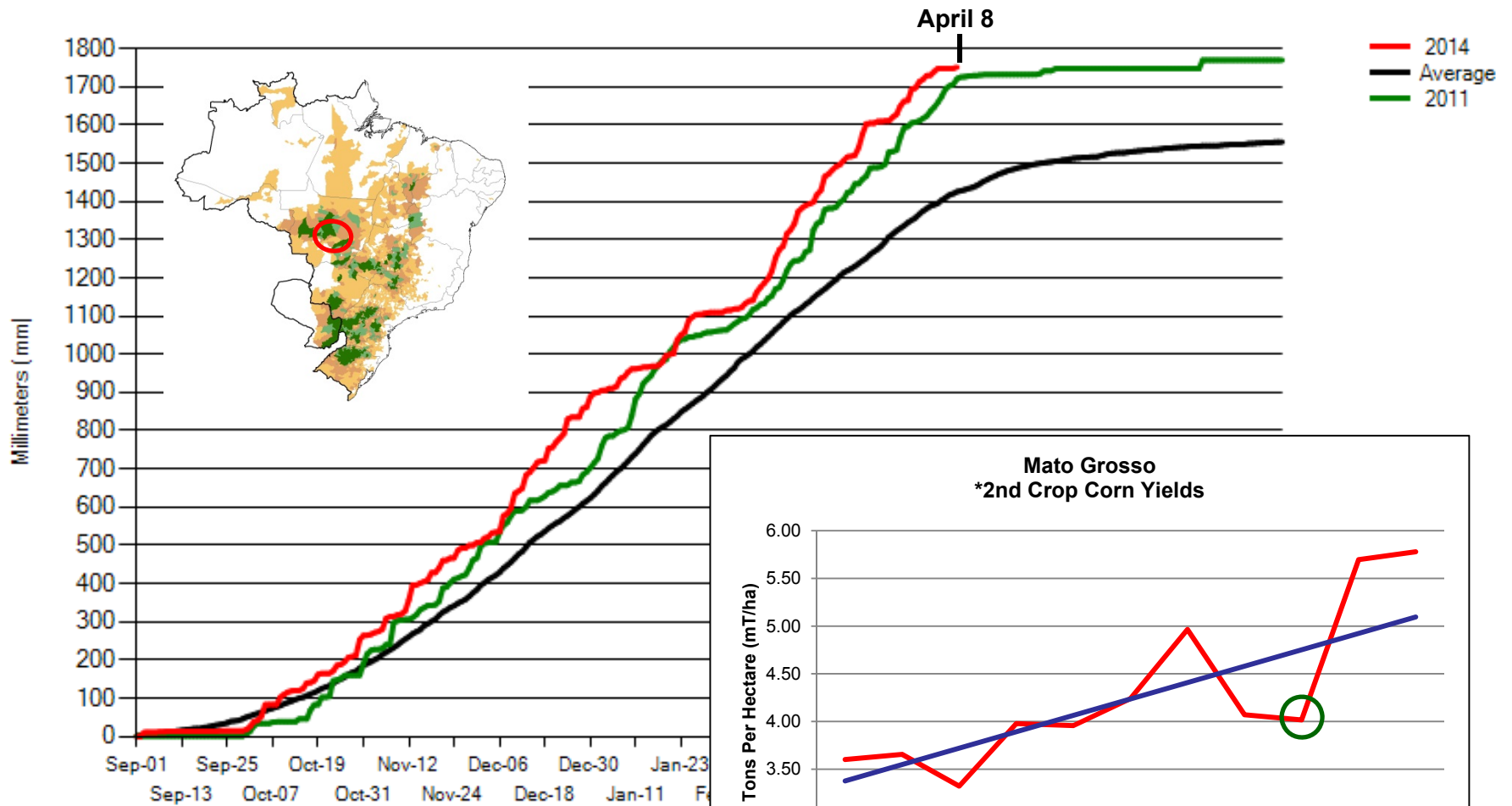
7 - MATO GROSSO

Total Precipitation: Apr 8 to May 31



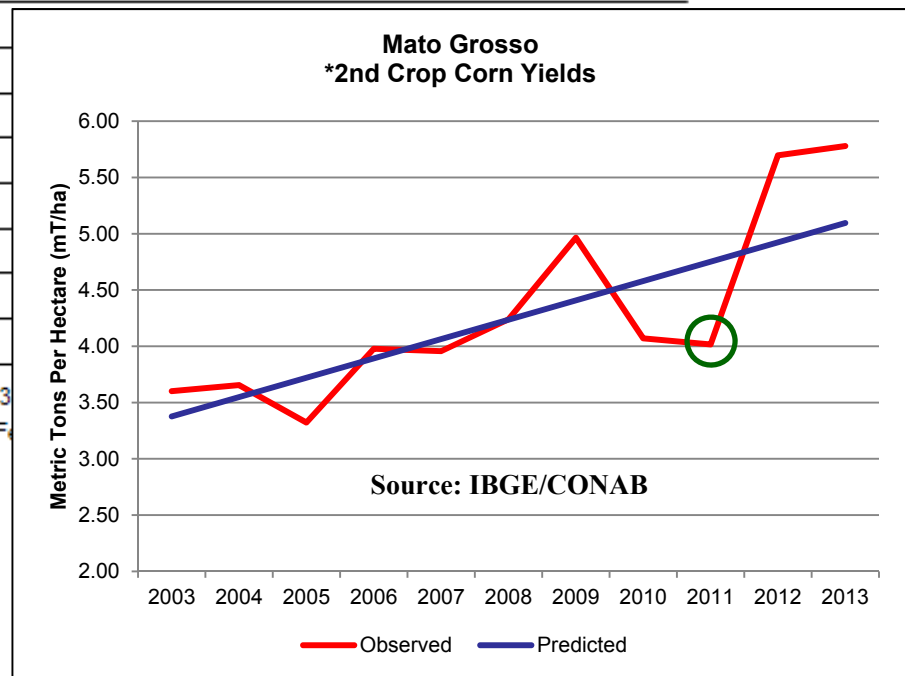
7 - MATO GROSSO

Cumulative Precipitation



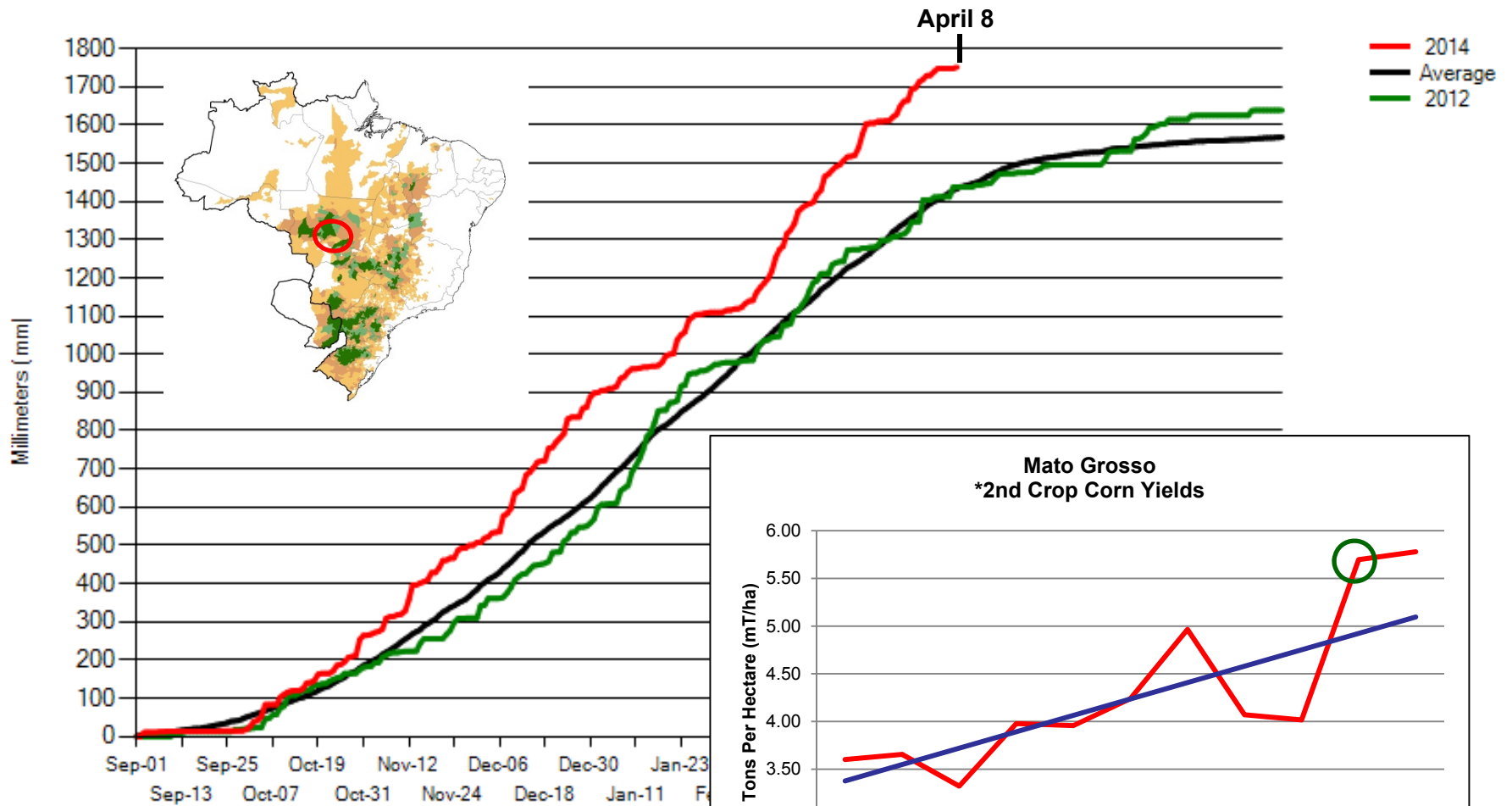
2011: Above-normal rainfall, then early end to season

2nd crop yield: 4.02 mT/ha (down 15.5%)



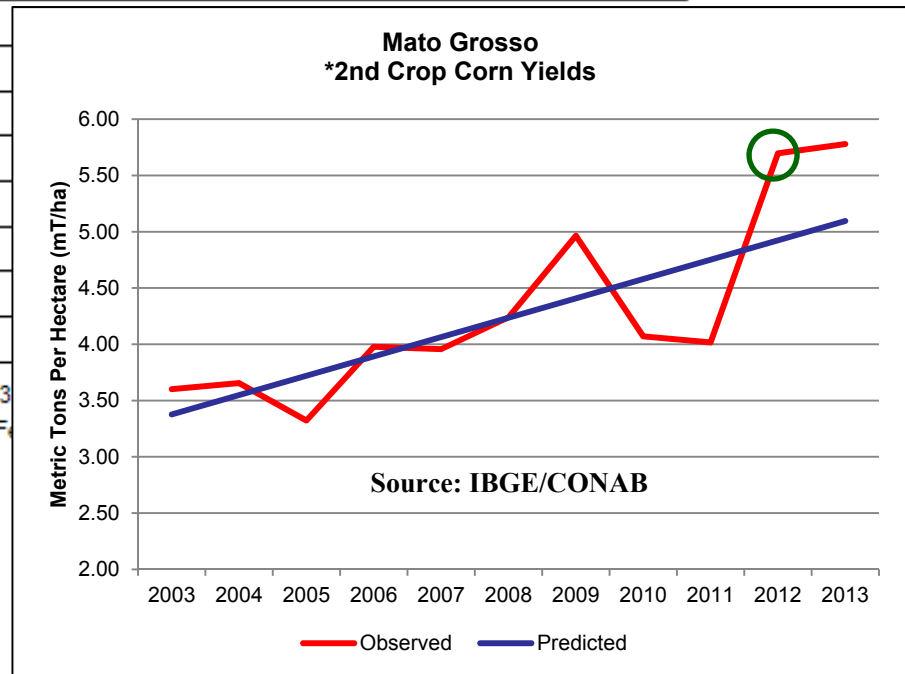
7 - MATO GROSSO

Cumulative Precipitation



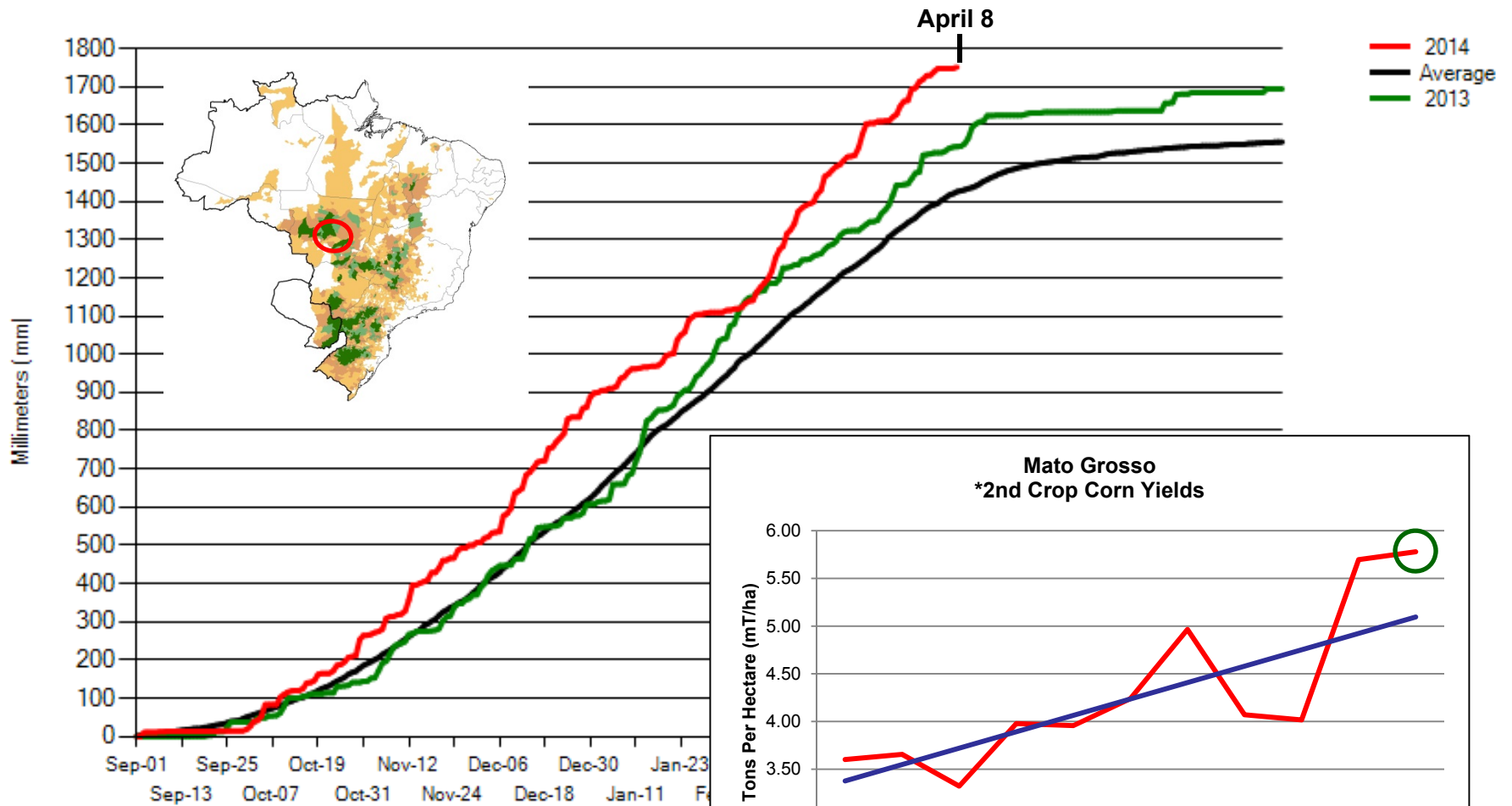
**2012: Near-normal rainfall, then
unusual May / June rainfall**

2nd crop yield: 5.70 mT/ha (up 15.5%)



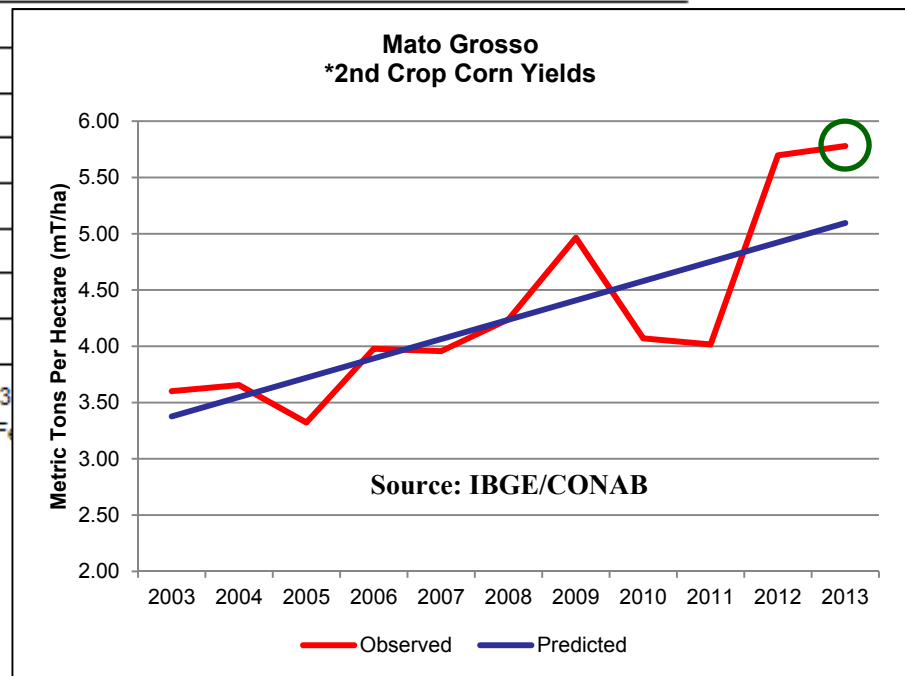
7 - MATO GROSSO

Cumulative Precipitation



2013: Above-normal rainfall, then scattered showers in May

2nd crop yield: 5.78 mT/ha (up 13.4%)



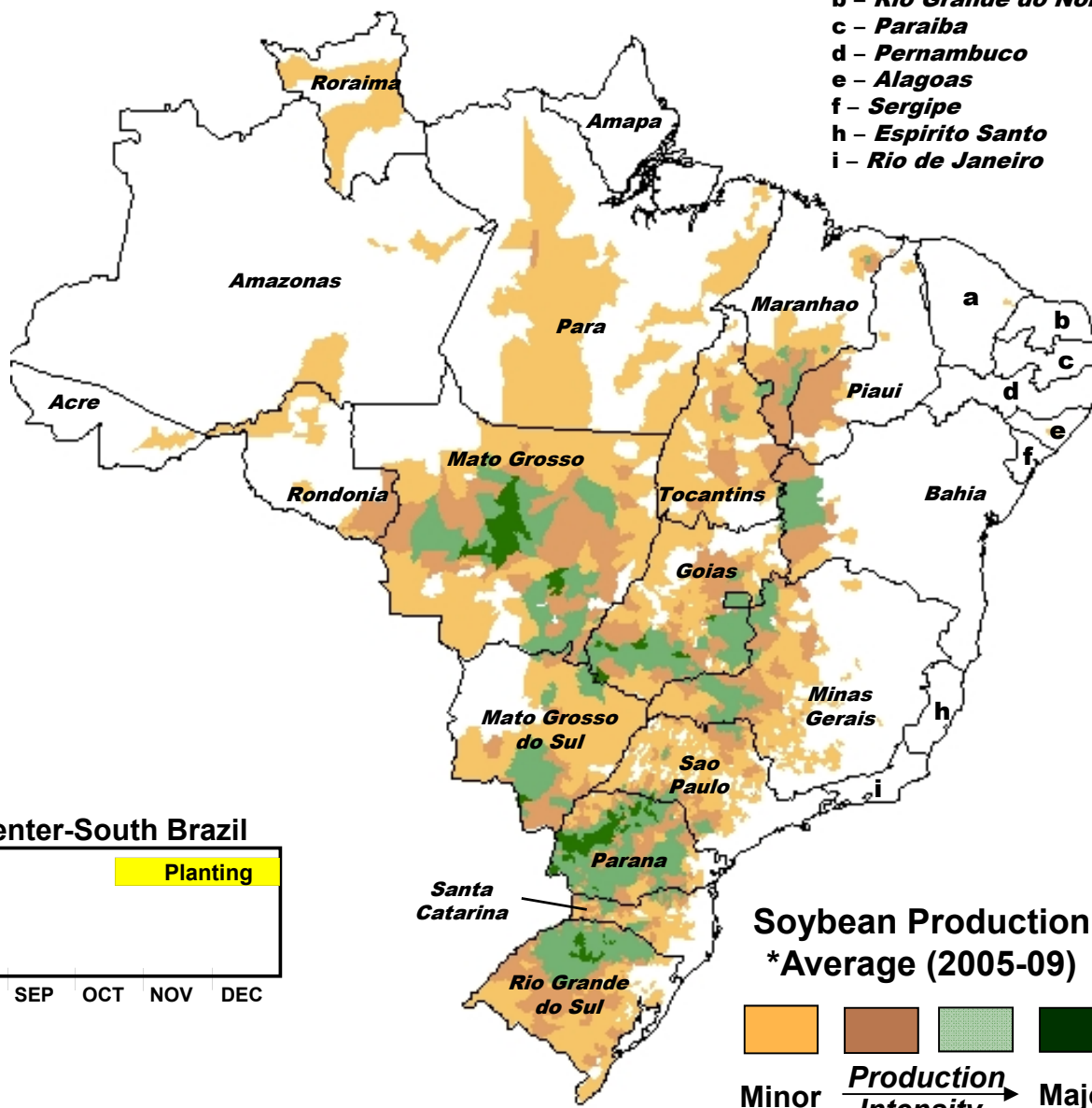
Brazil Soybeans

* State-Level Production (as % of total)

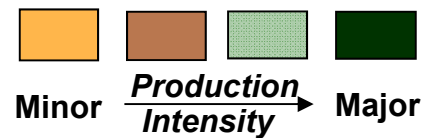
Mato Grosso	30
Parana	19
Rio Grande do Sul	13
Goias	12
Mato Grosso do Sul	8
Minas Gerais	5
Bahia	4
Sao Paulo	3
Maranhao	2
Santa Catarina	2
Tocantins	2
Other	~2

* 2005 to 2009 Average
Source: IBGE Brazil

- a - Ceara
- b - Rio Grande do Norte
- c - Paraiba
- d - Pernambuco
- e - Alagoas
- f - Sergipe
- h - Espirito Santo
- i - Rio de Janeiro

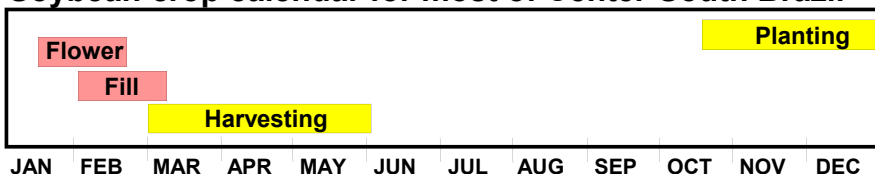


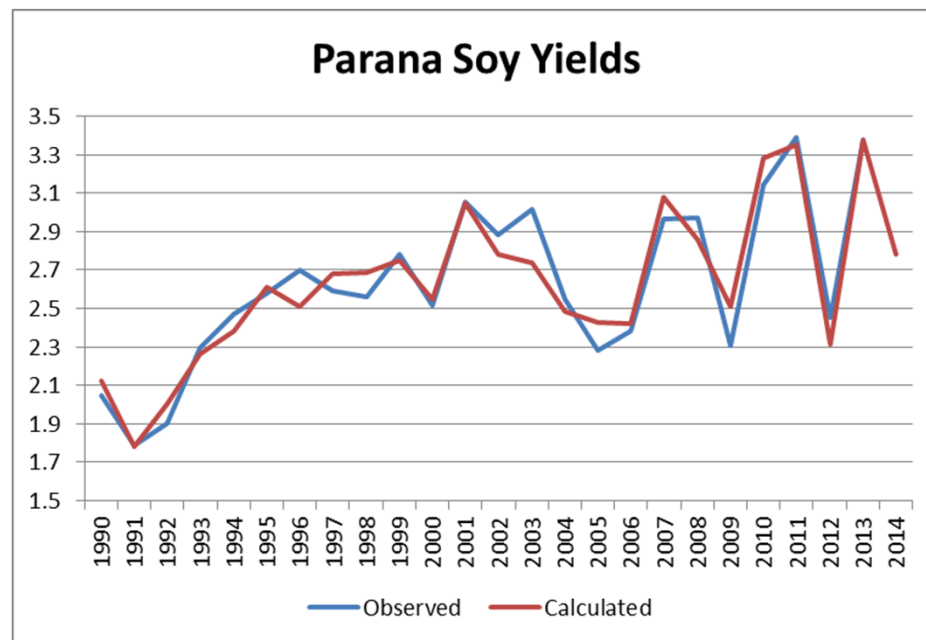
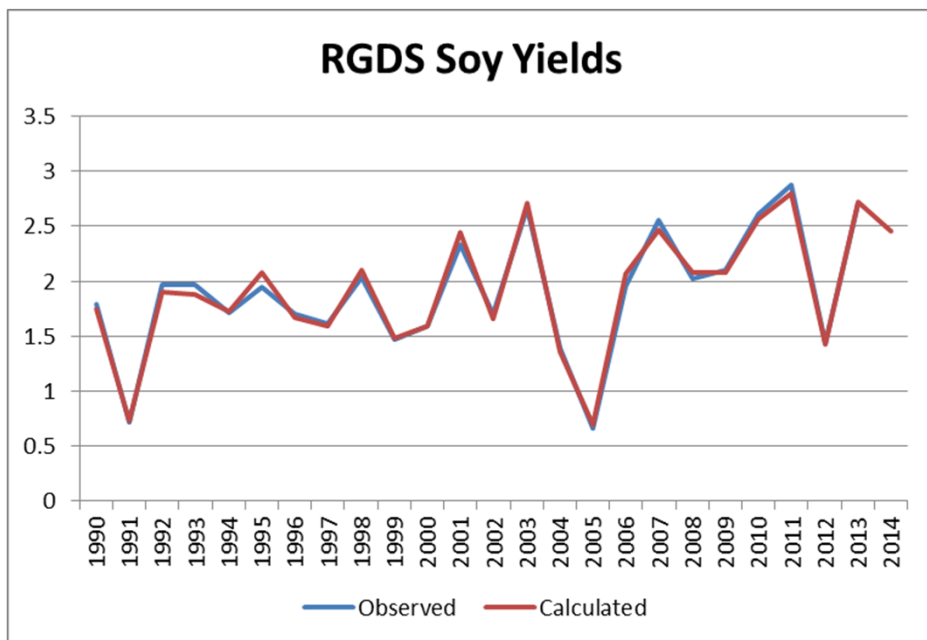
Soybean Production *Average (2005-09)



*Source: IBGE

Soybean crop calendar for most of Center-South Brazil





Elements: Average Temperature, Days $\geq 35^{\circ}\text{C}$, Precipitation, Days Between Rainfall

**Rio Grande do Sul:
Jan, Feb, Mar ($r^2 = .99$)**

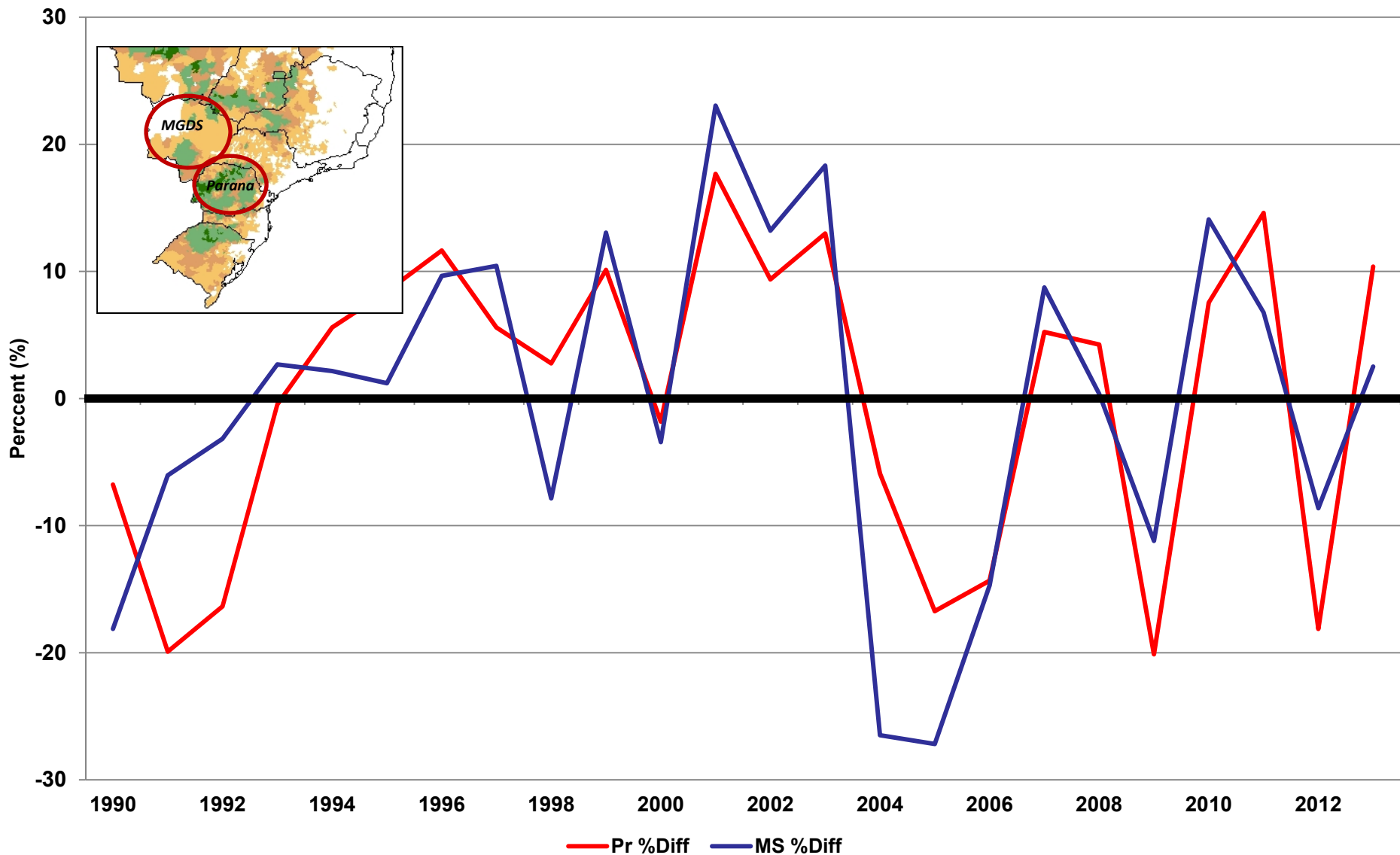
Estimated yield: 2.54 mT/ha

March Lockup: 2.45 mT/ha

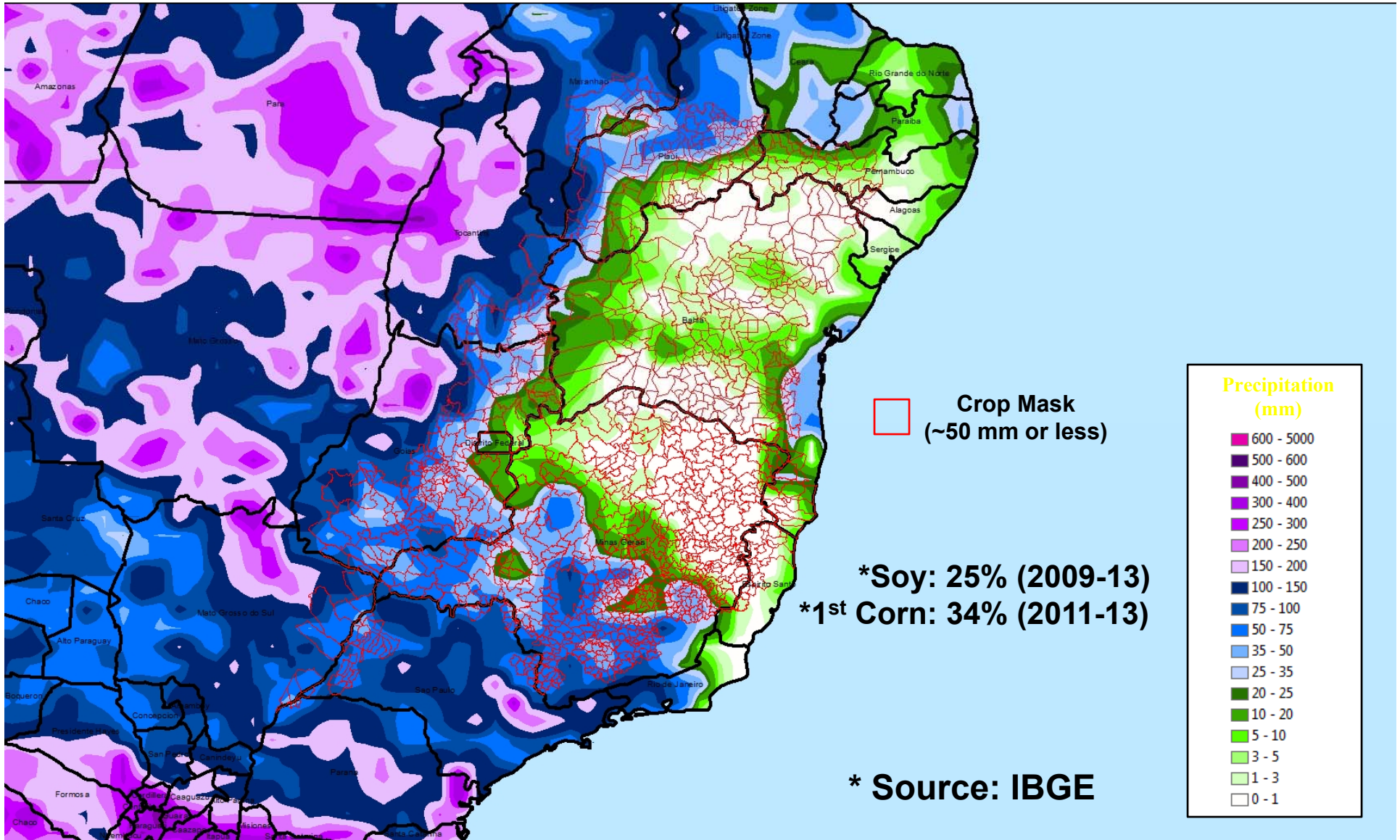
**Parana:
Dec, Jan, Feb ($r^2 = .92$)**

Estimated yield: 2.78 mT/ha

Comparison of Yield Departures From Trend Parana versus Mato Grosso do Sul



Blended Precipitation (CMORPH & WMO): Jan 1-21, 2015



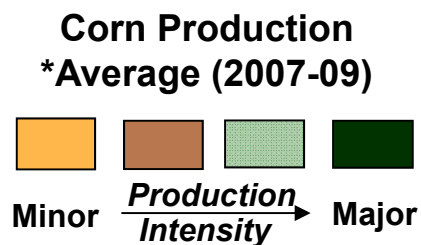
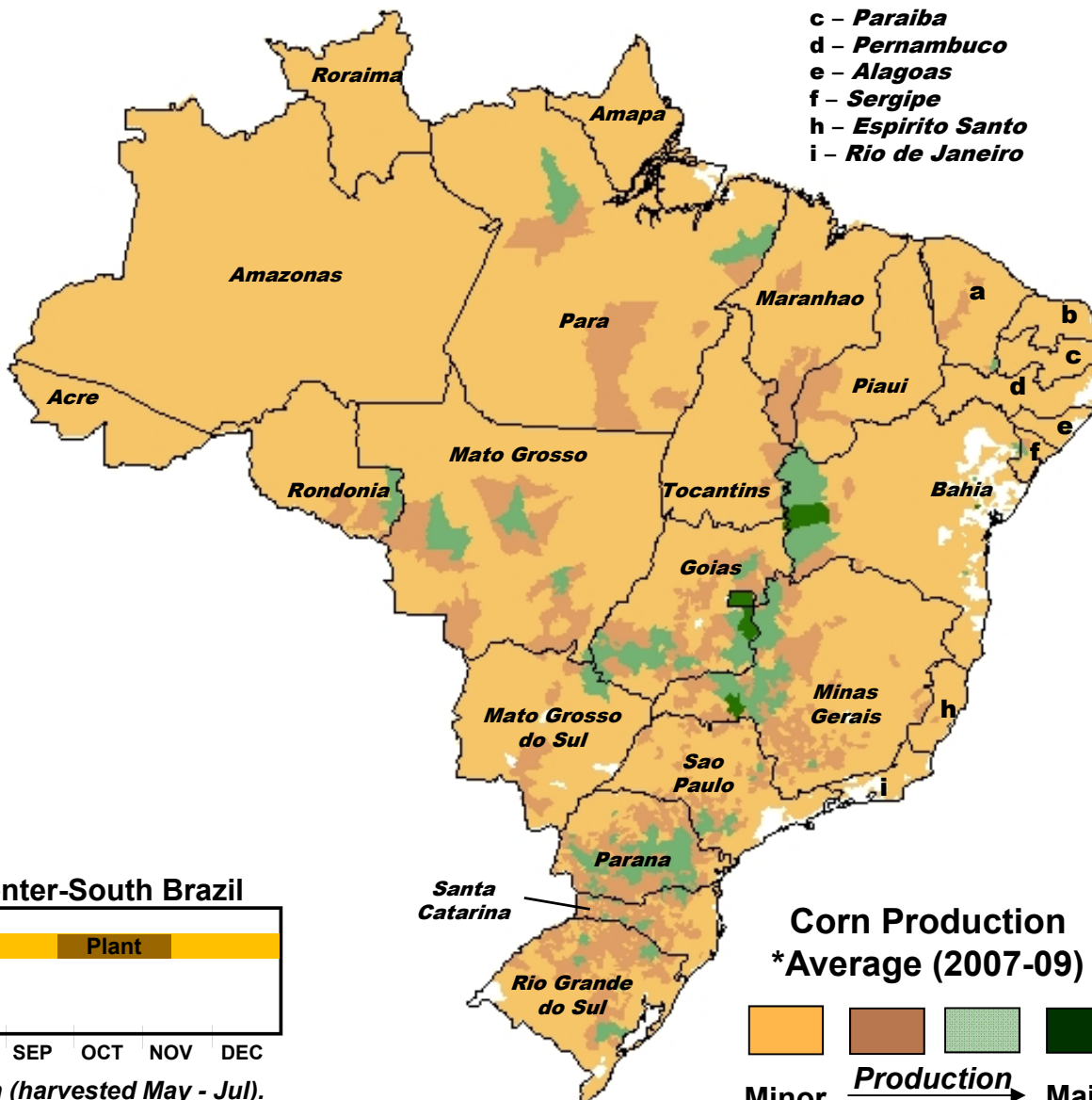
Brazil Corn (First Crop)

* State-Level Production
(as % of total)

Parana	23
Minas Gerais	17
Rio Grande do Sul	14
Santa Catarina	10
Sao Paulo	10
Goias	9
Bahia	4
Mato Grosso	3
Para	2
Mato Grosso do Sul	2
Ceara	2
Sergipe	1
Maranhao	1
Other States	~4

* 2007 to 2009 Average
Source: IBGE Brazil

- a - Ceara
- b - Rio Grande do Norte
- c - Paraiba
- d - Pernambuco
- e - Alagoas
- f - Sergipe
- h - Espirito Santo
- i - Rio de Janeiro



*Source: IBGE

1st Corn crop calendar for most of Center-South Brazil



JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC

In Northeast Brazil, 1st crop planted Dec - Jan (harvested May - Jul).

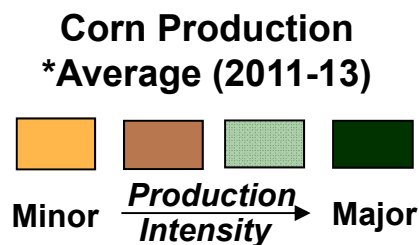
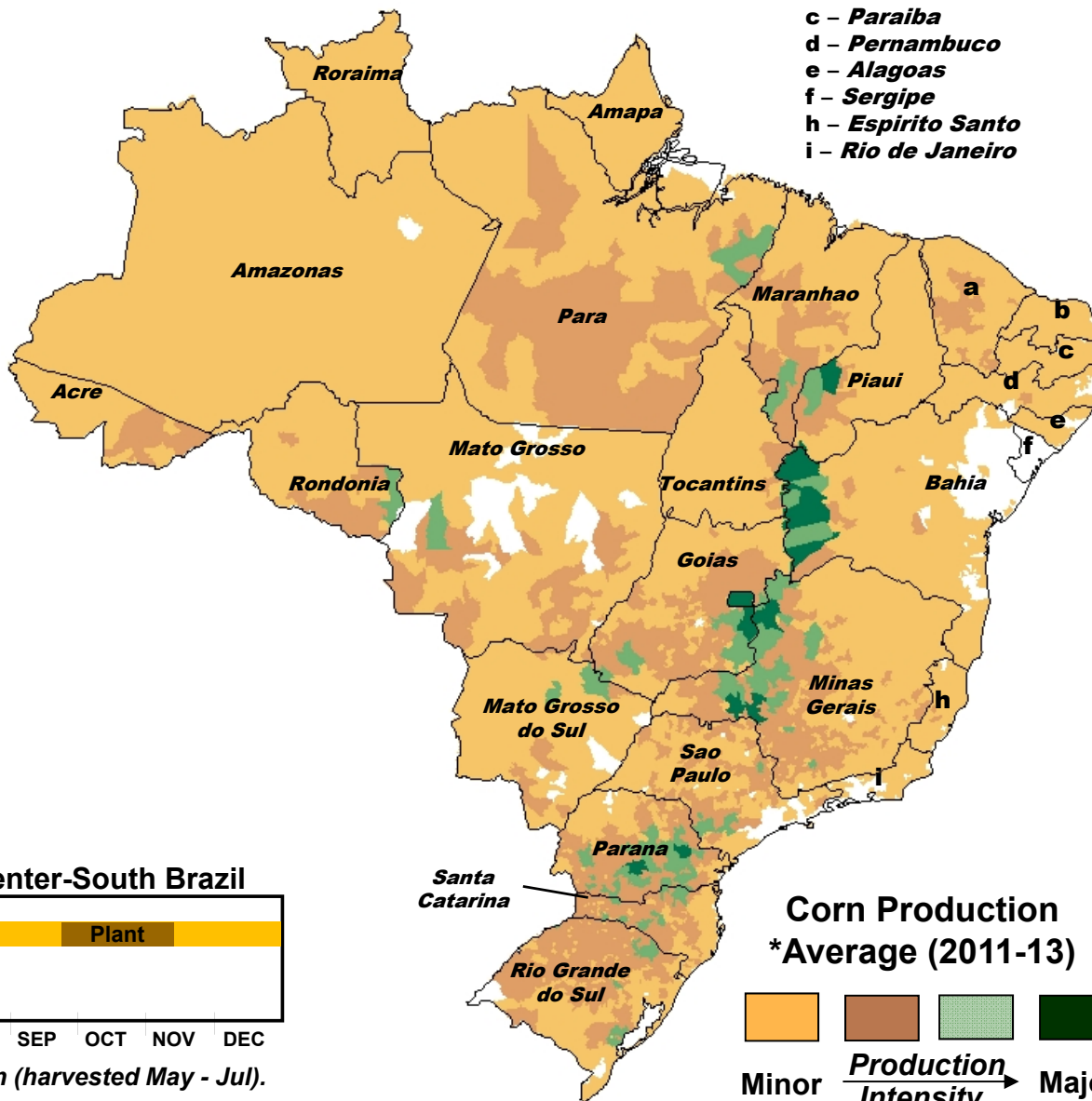
Brazil Corn (First Crop)

* State-Level Production
(as % of total)

Minas Gerais	20
Parana	20
Rio Grande do Sul	14
Santa Catarina	10
Goias	9
Sao Paulo	9
Bahia	5
Maranhao	2
Piaui	2
Para	2
Mato Grosso	1
Mato Grosso do Sul	1
Ceara	1
Other States	~4

* 2011 to 2013 Average
Source: IBGE Brazil

- a - Ceara
- b - Rio Grande do Norte
- c - Paraiba
- d - Pernambuco
- e - Alagoas
- f - Sergipe
- h - Espirito Santo
- i - Rio de Janeiro



*Source: IBGE

1st Corn crop calendar for most of Center-South Brazil



JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC

In Northeast Brazil, 1st crop planted Dec - Jan (harvested May - Jul).

Other Climate Data / Information

THOMSON REUTERS

EIKON™

FACTBOX-The boy is back? El Nino expected within months - RTRS

09-Oct-2014 10:14

Oct 9 (Reuters) - The U.S. weather forecaster said on Thursday the El Nino weather phenomenon could surface within one or two months and last into the Northern Hemisphere spring, though it will remain weak throughout its duration.

El Nino, Spanish for "the boy", is a warming of sea-surface temperatures in the Pacific Ocean. Below are some key commodities that could be affected by its return.

GRAINS. OILSEEDS. LIVESTOCK

El Nino could bring dry weather to Australia, which is already struggling with a drought, and it could also curb the country's wheat, sugar and cotton production.

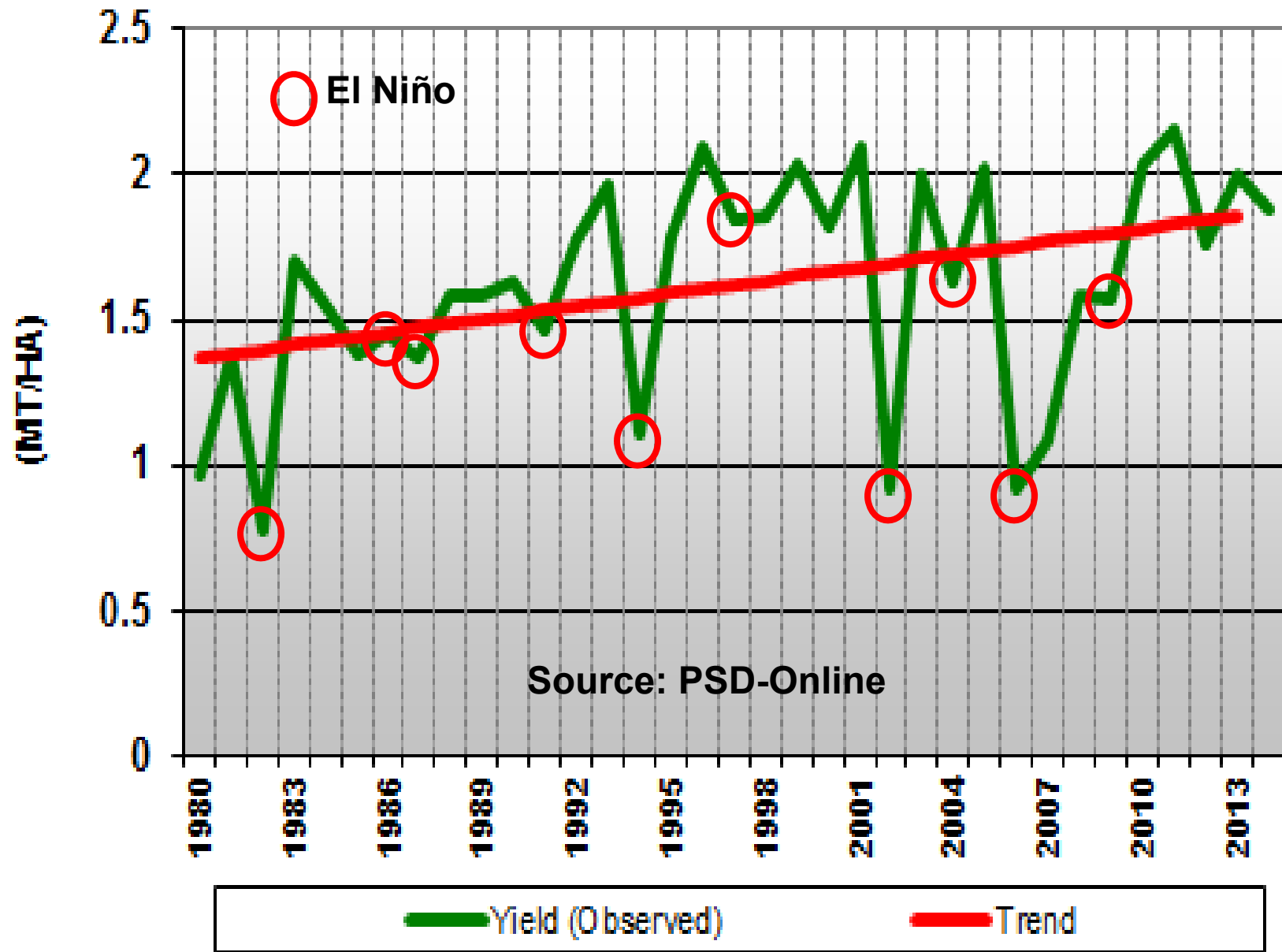
An El Nino episode usually results in below-average rainfall in main palm oil producers Indonesia and Malaysia, cutting yields and pushing up global prices.

It could also worsen drought conditions in Thailand, a leading rice exporter.

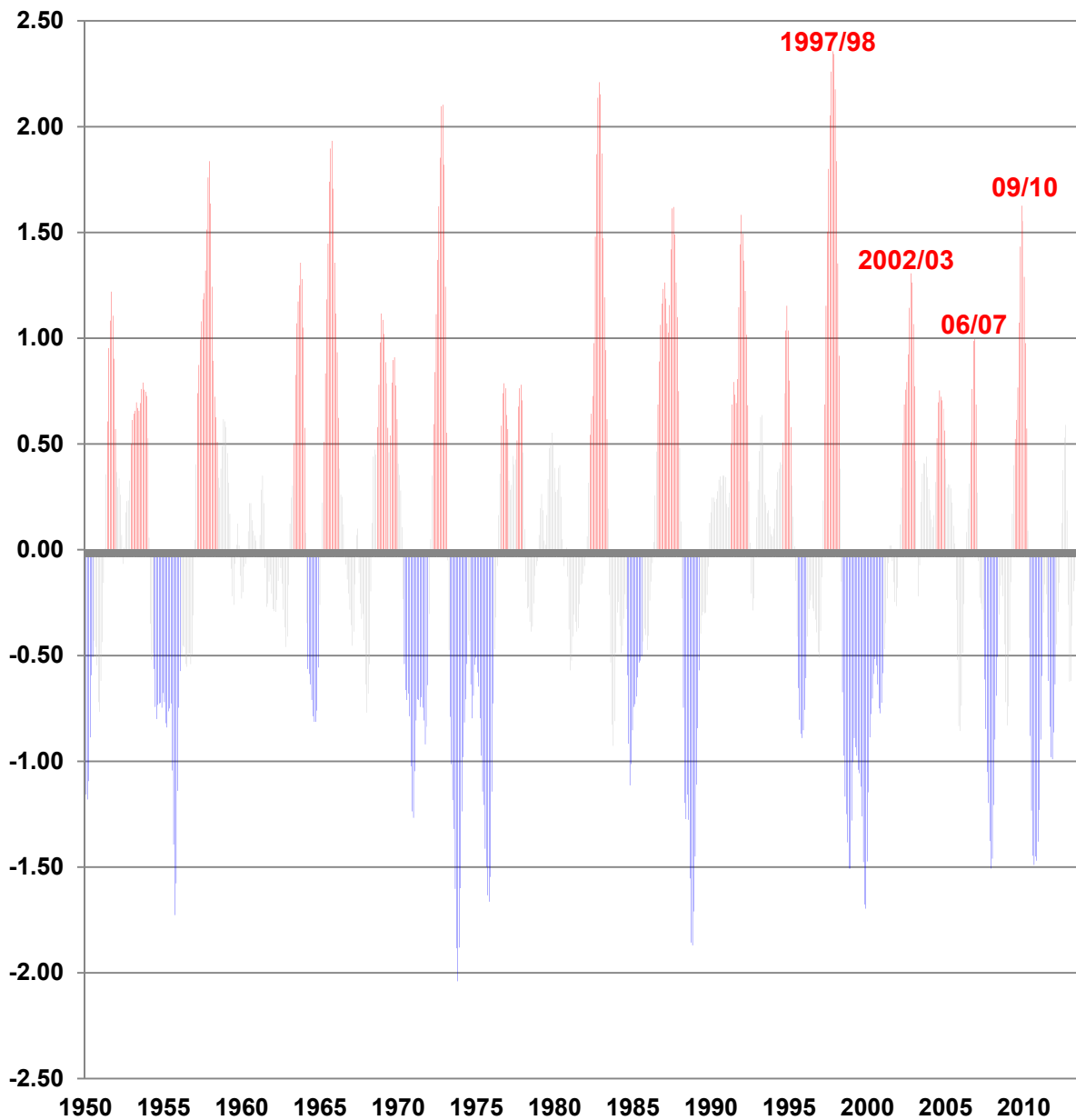
El Nino would bring milder-than-normal temperatures to the U.S. Midwest. Iowa and Minnesota would benefit from the event's tendency for wetter-than-normal summers as the western Corn Belt recovers from a drought.

But excessive rains on the saturated soils of the eastern Corn Belt could be troublesome after an overly snowy winter. Drought-hit California, a major dairy and wine grape state, could see above-normal rainfall.

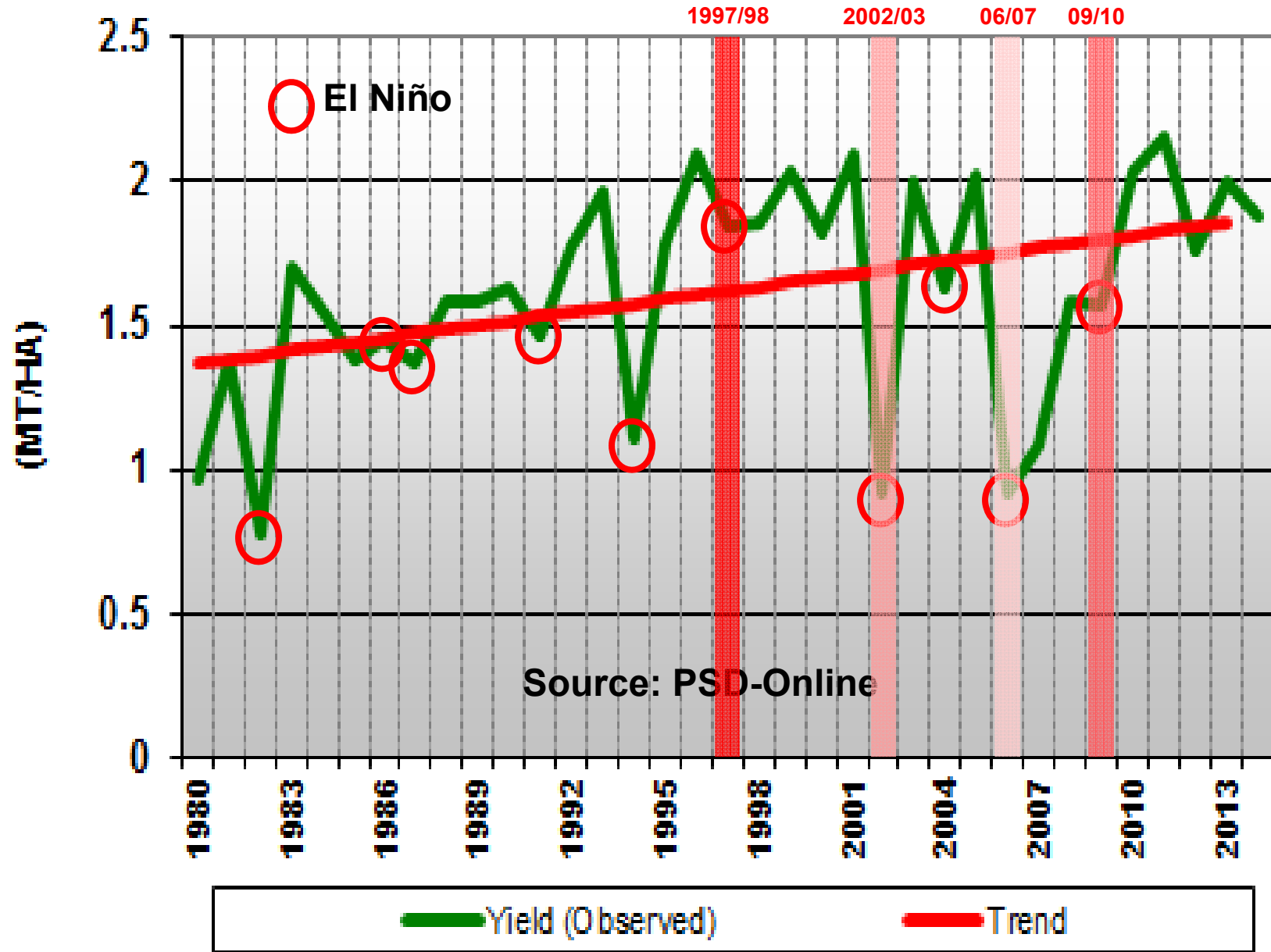
Australia: Wheat



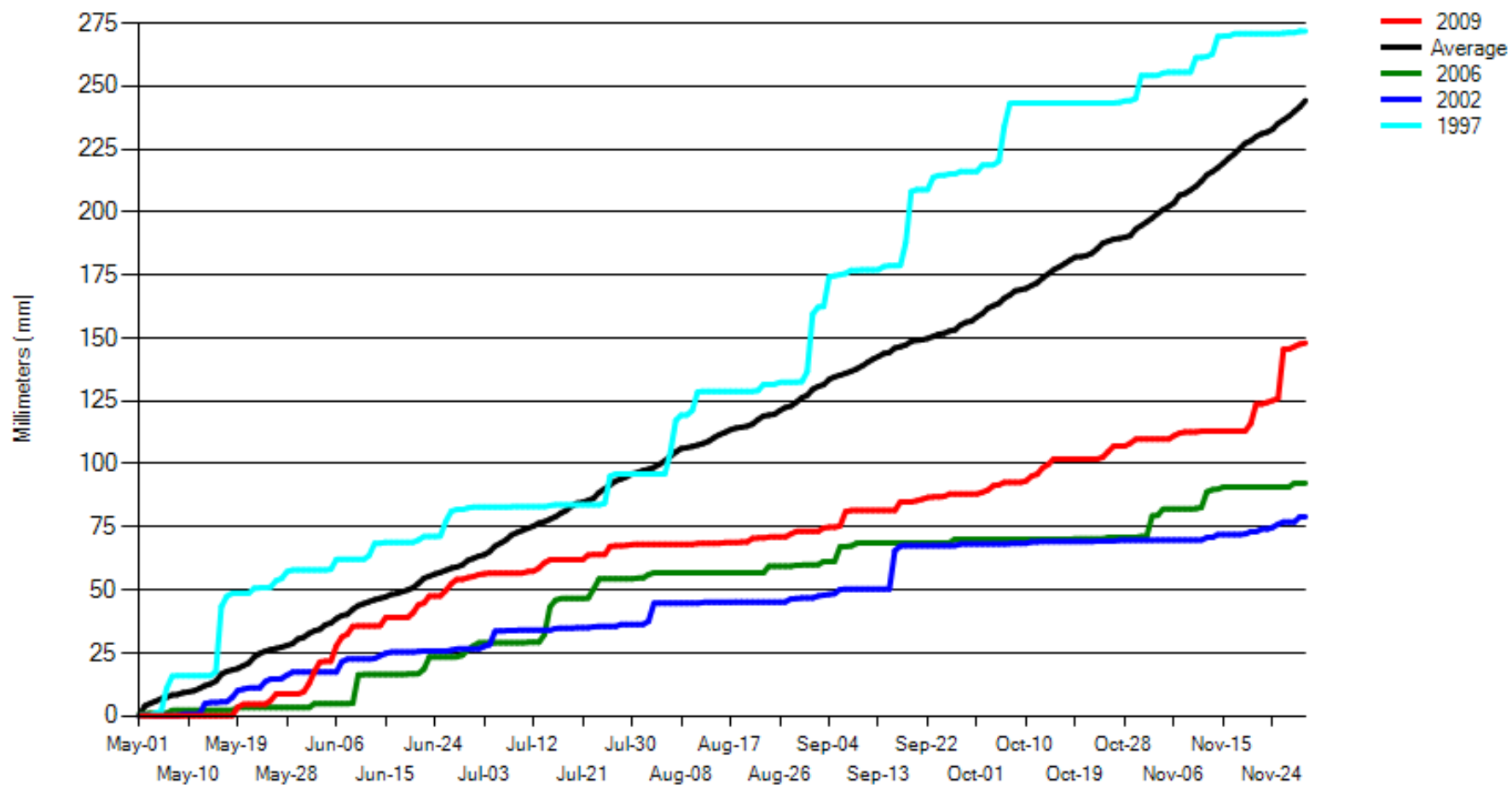
Sea Surface Temperature Anomalies (°C) Niño Region 3.4



Australia: Wheat



2 - NSW-WHEAT Cumulative Precipitation



Thank You !

mbrusberg@oce.usda.gov