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

USDA Agricultural Weather Assessments
World Agricultural Outlook Board

WASDE Report

World Agricultural Outlook Board

World Agricultural Supply and Demand Estimates

ISSN: 1554-9089

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 proje
price is lowered to $7.50 to $8.70 per bushel con
Prices reported for the summer months, when pr
remained well below cash bids and futures prices
producers earlier in the year.

Global wheat supplies for 2012/13 are projected
production in Russia. An increase in foreign beg
ton reduction in world wheat output. Beginning s
for Argentina. Production for Russia is reduced 4
reduced yields as harvest results confirm additio
spring wheat crops. Production is also lowered 0
experienced the same adverse drought and heat
in the central and eastern growing regions of Rus
mostly reflecting lower expected yields in the Uni
million tons based on higher reported yields. Pro
mostly on higher reported area.

Global wheat consumption for 2012/13 is lowered
residual use in Russia and Kazakhstan. Food us
additional reductions projected for food use in Eg
Afghanistan, Iran, and Libya.

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

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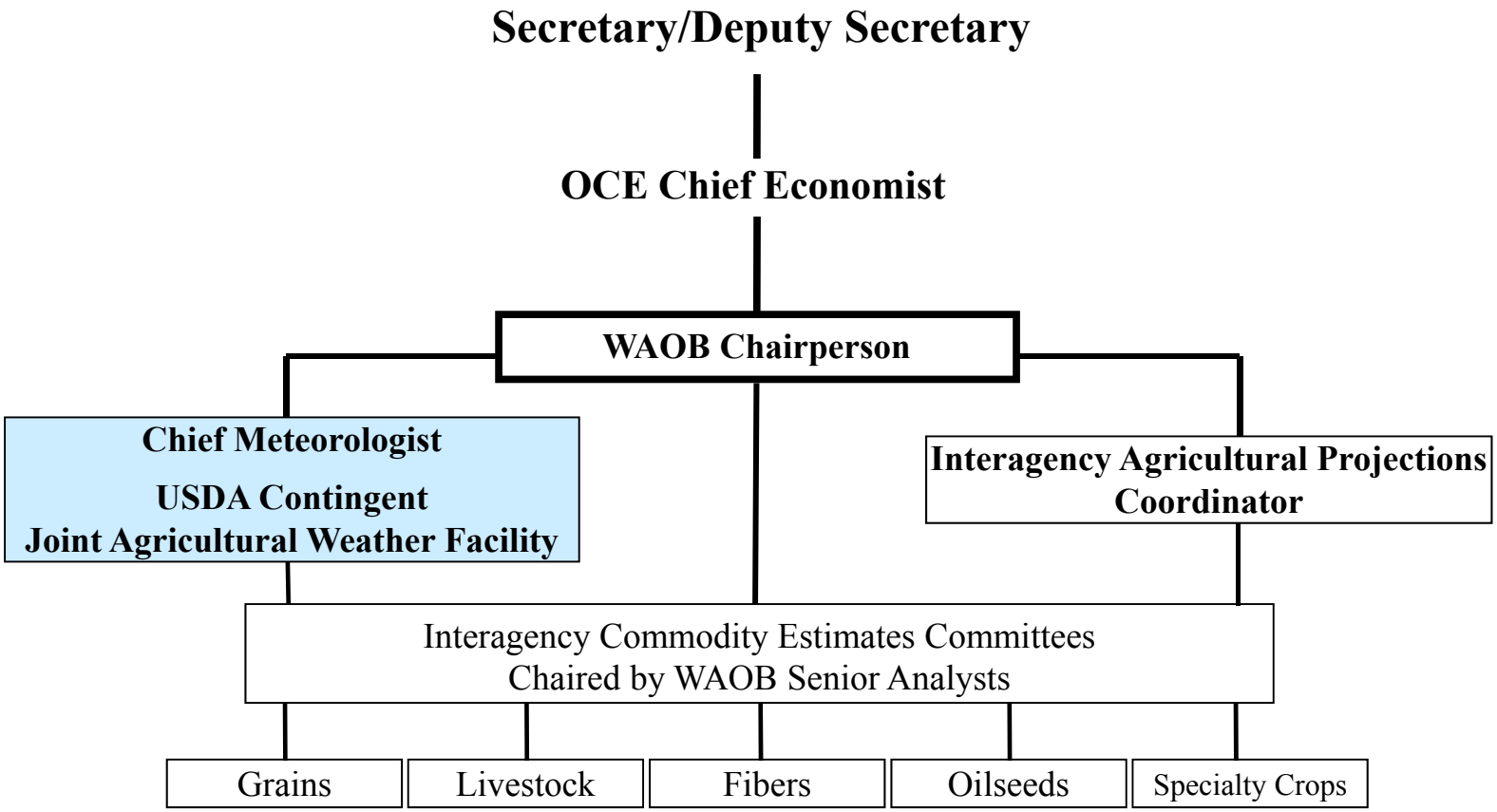
USDA Situation and Outlook Organizational Structure



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

U.S. Dept. of Agriculture

Office of the Chief Economist

World Agricultural Outlook Board

National Agricultural Statistics Service

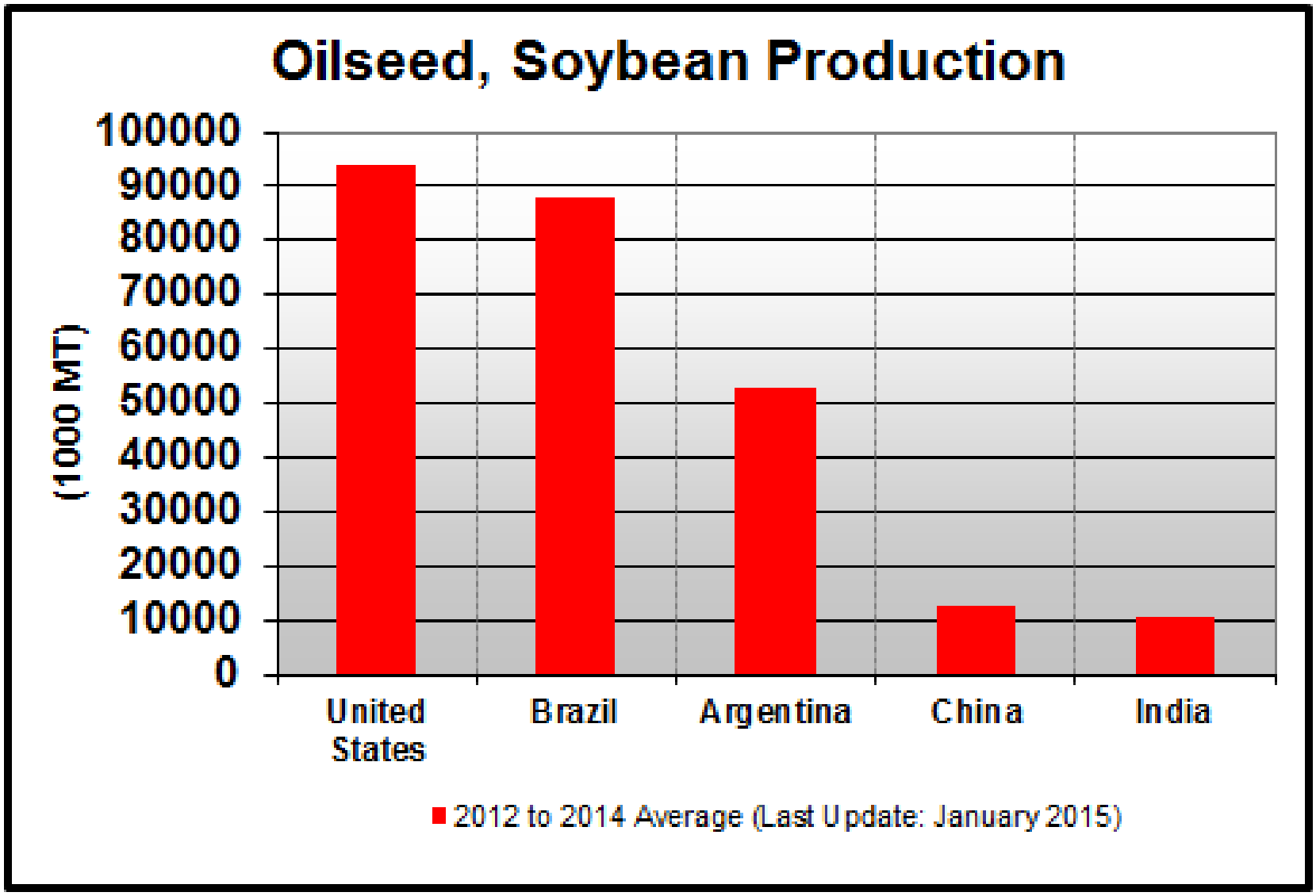
Agricultural Statistics Board

Global Weather Data

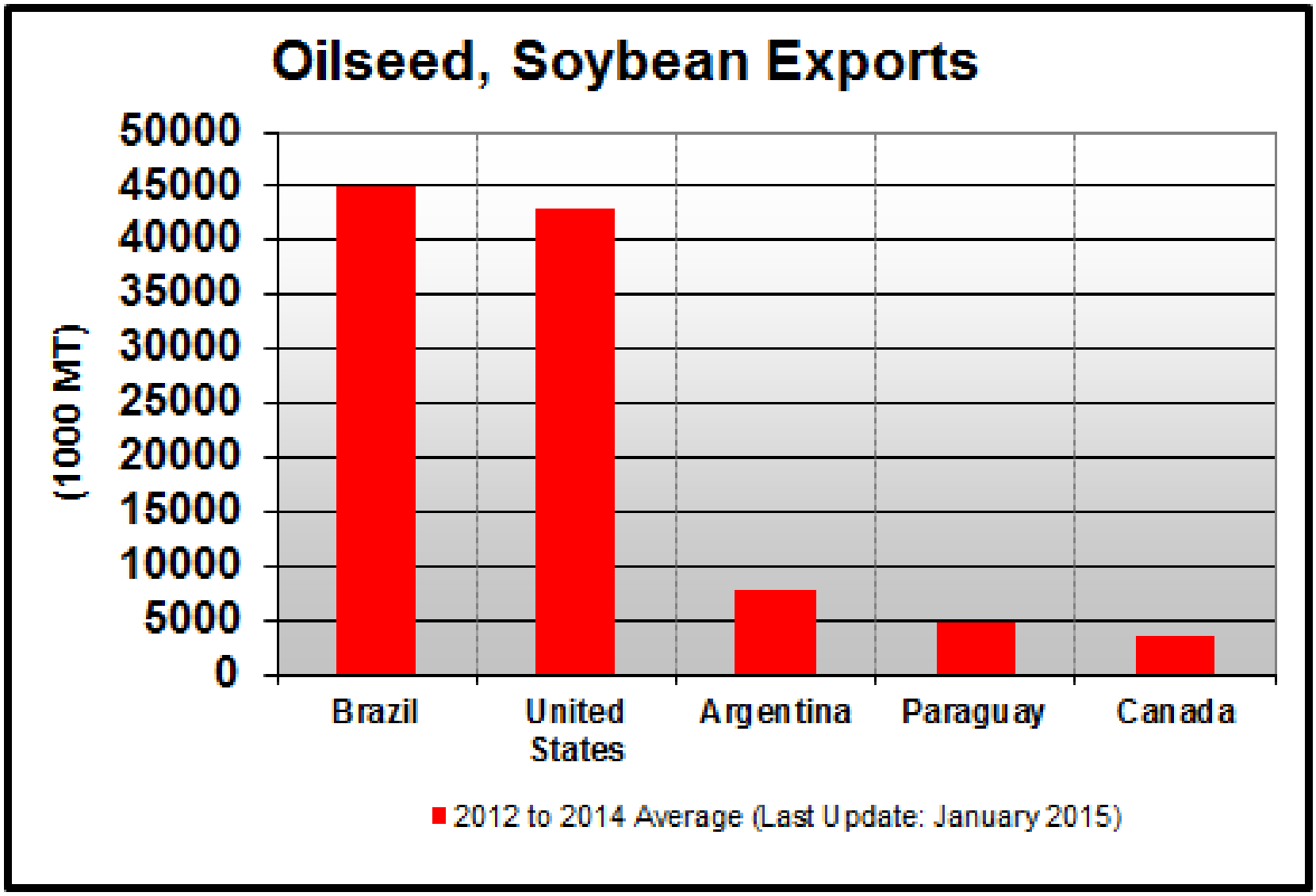
International Crop Information

Domestic Crop Statistics

JOINT AGRICULTURAL WEATHER FACILITY

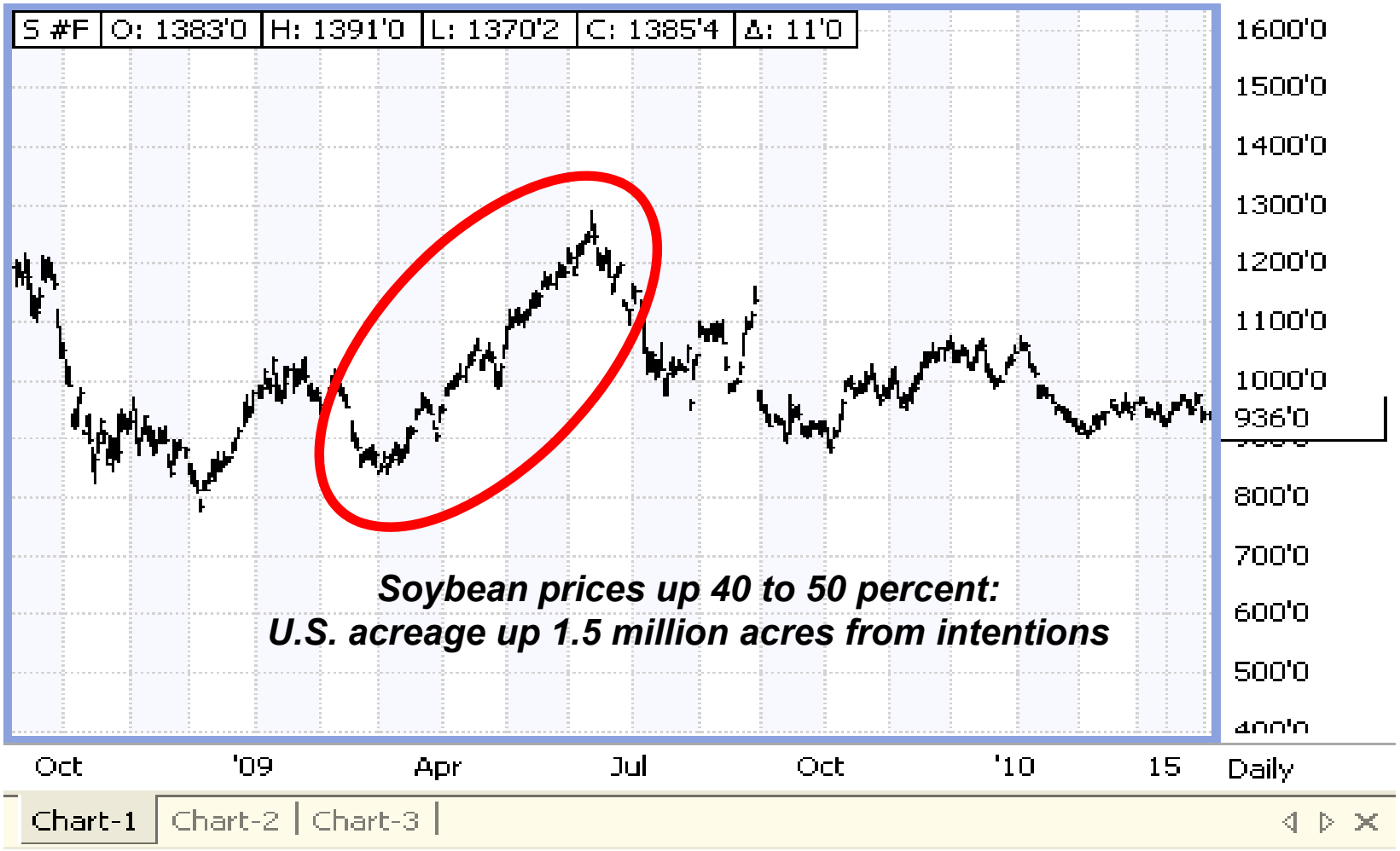

Oilseed, Soybean Production
(1000 MT)
100000
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
United States
Brazil
Argentina
China
India
2012 to 2014 Average (Last Update: January 2015)

Source: USDA


Oilseed, Soybean Exports
(1000 MT)
50000
45000
40000
35000
30000
25000
20000
15000
10000
5000
0
Brazil
United States
Argentina
Paraguay
Canada
2012 to 2014 Average (Last Update: January 2015)

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

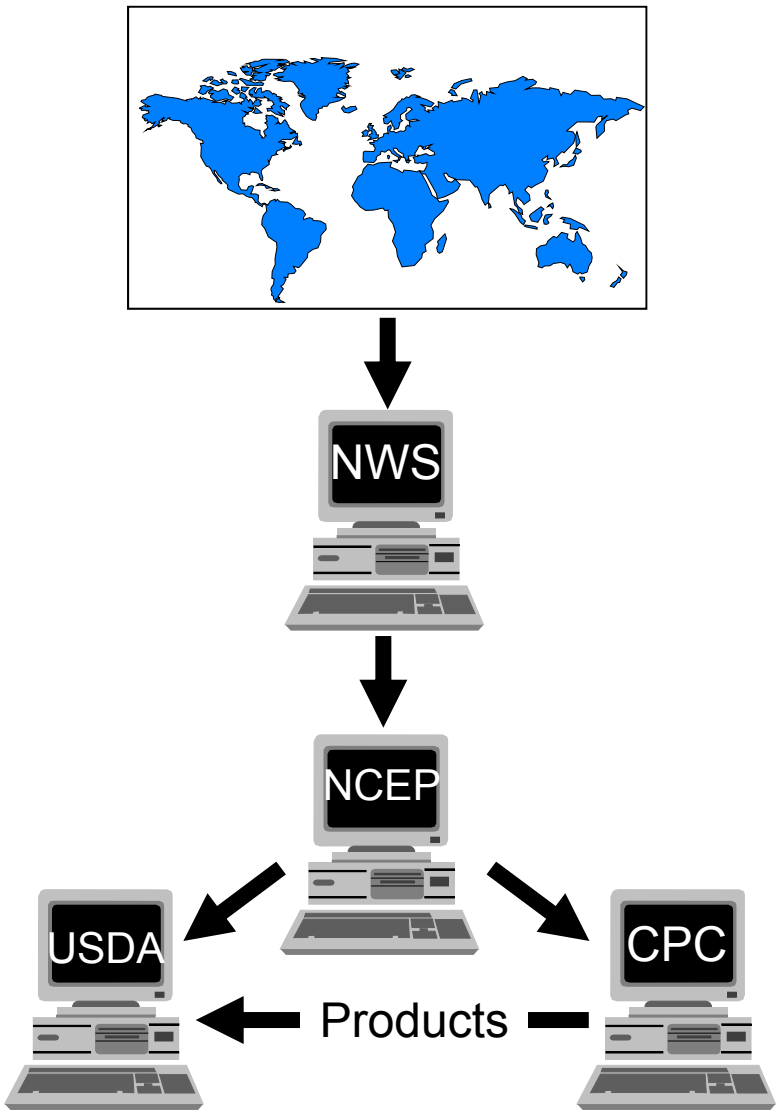
23-Feb-2015 11:05 - MOROCCO COULD HARVEST RECORD CEREAL CROP ABOVE 10 MLN TONNES THIS YEAR AFTER FAVOURABLE RAINS - FARM MINISTRY OFFICIAL

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

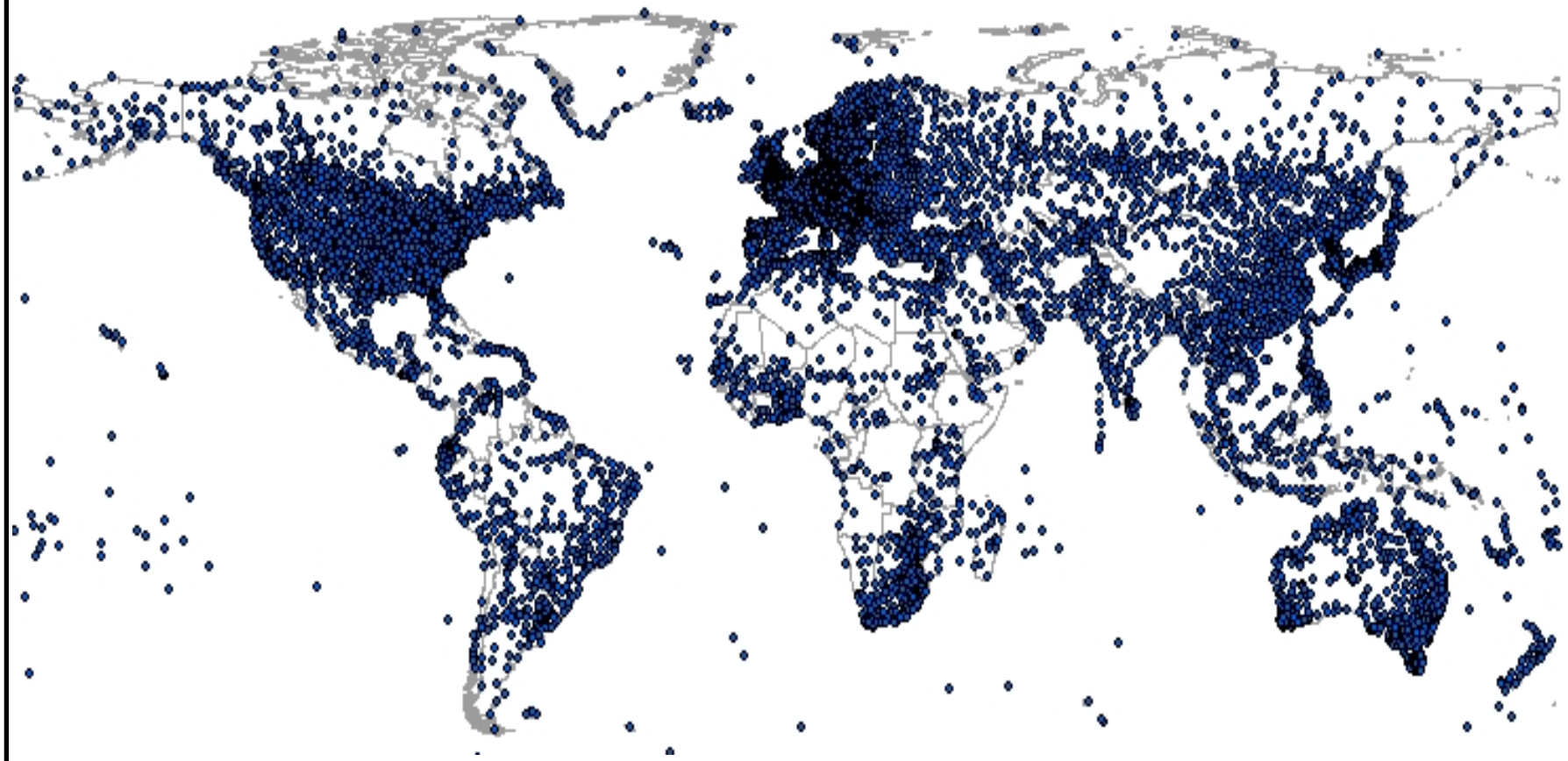
Weather Data

- 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



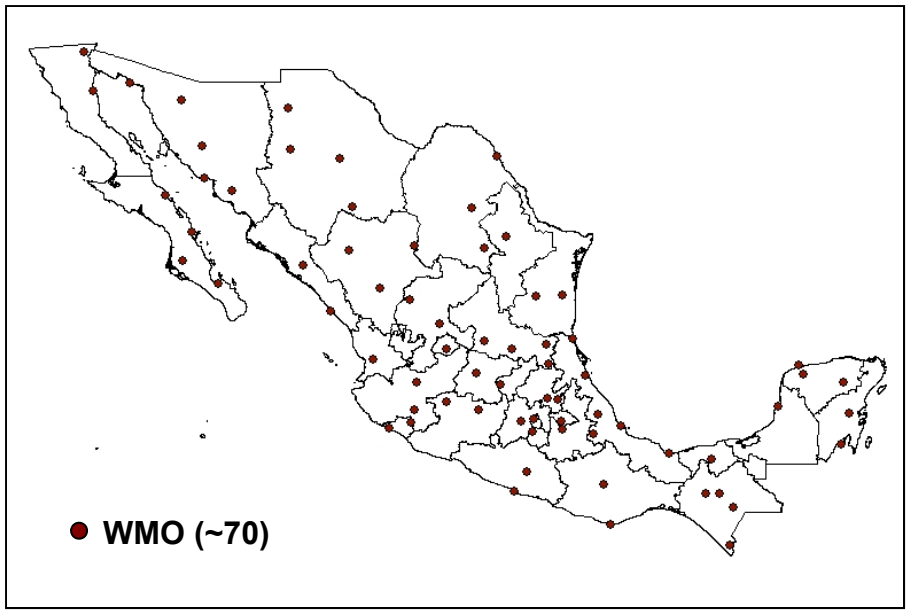
* Most have data since at least 1982
(many with normals)

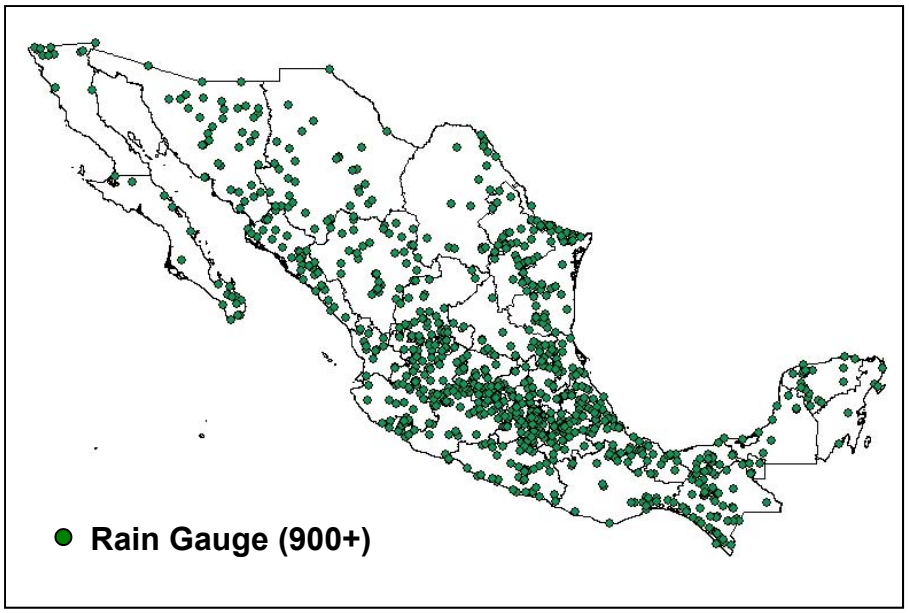
Location of weather stations
received daily via the WMO[1]

[1] United Nations World Meteorological Organization

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

Secondary sources of weather data

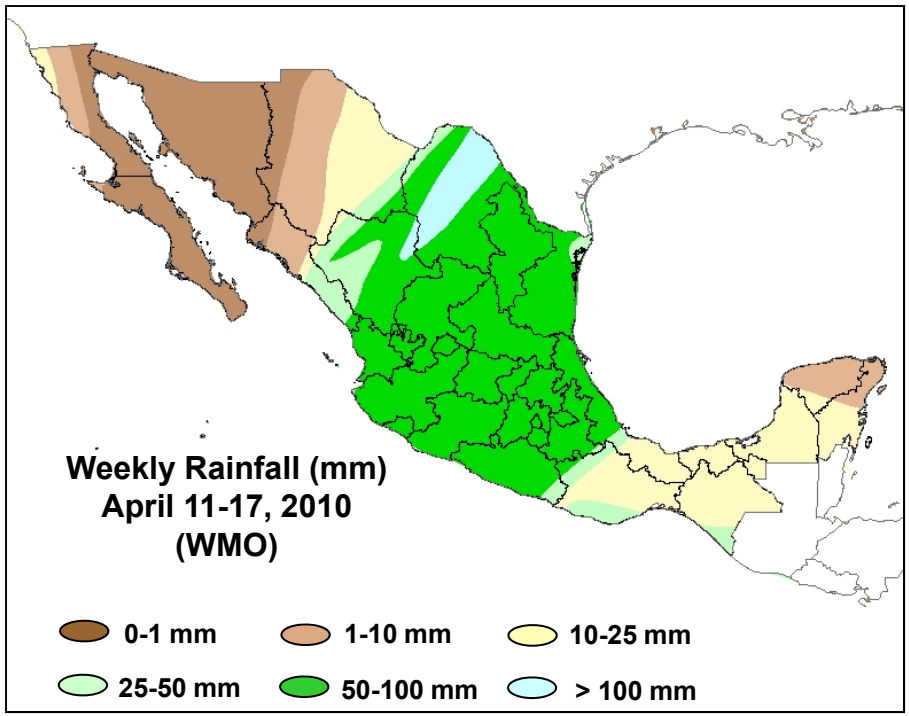


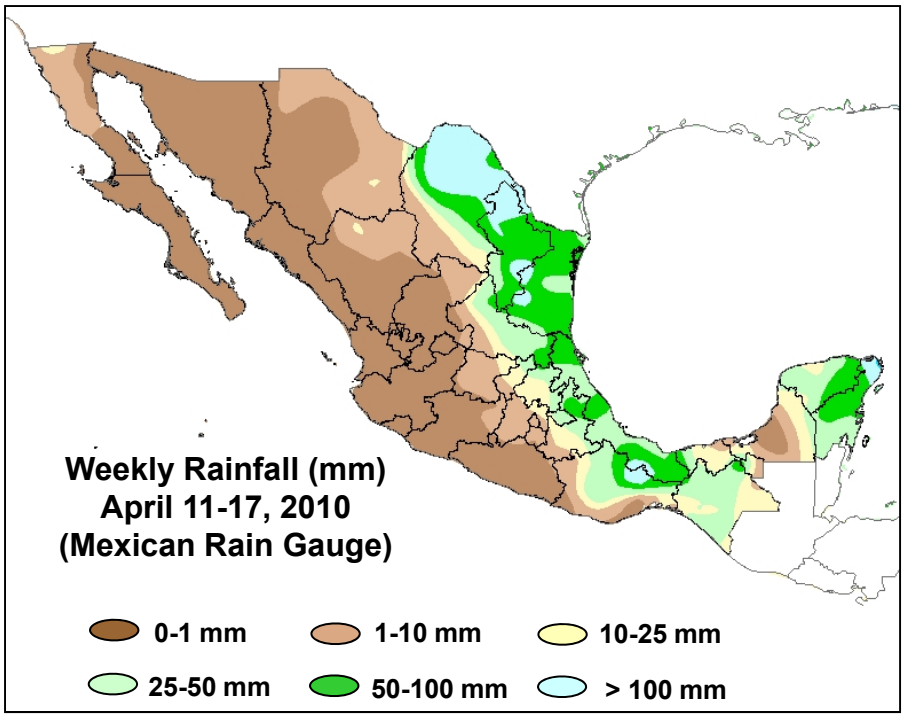


Data obtained by CPC from the Mexican weather bureau are incorporated into the weekly rainfall chart created for the ***Weekly Weather and Crop Bulletin*** and are provided separately to USDA analysts for their analysis of crop weather impacts.

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

Secondary sources of weather data

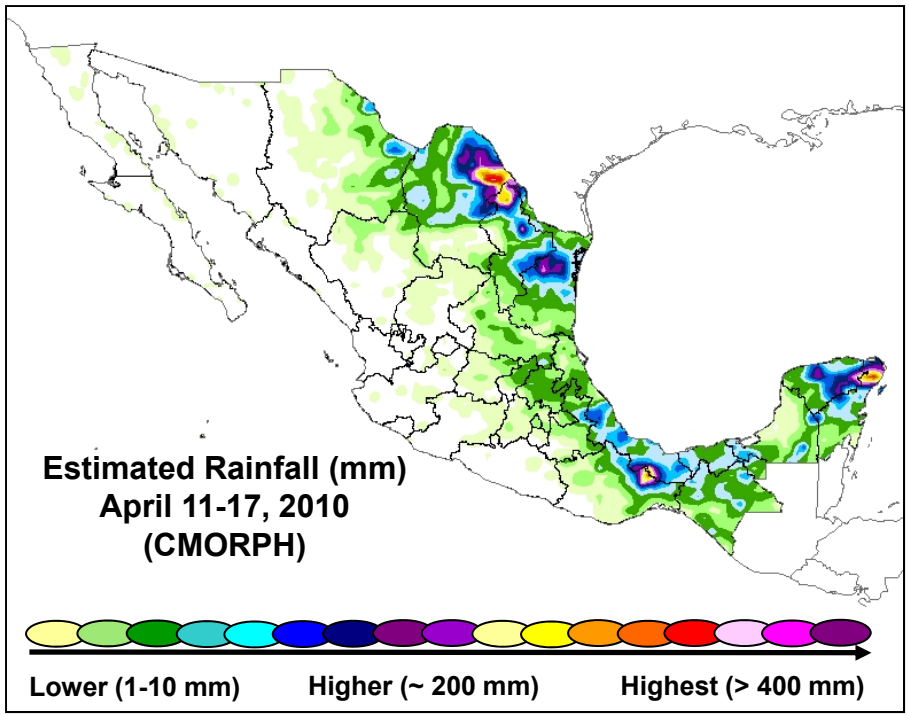


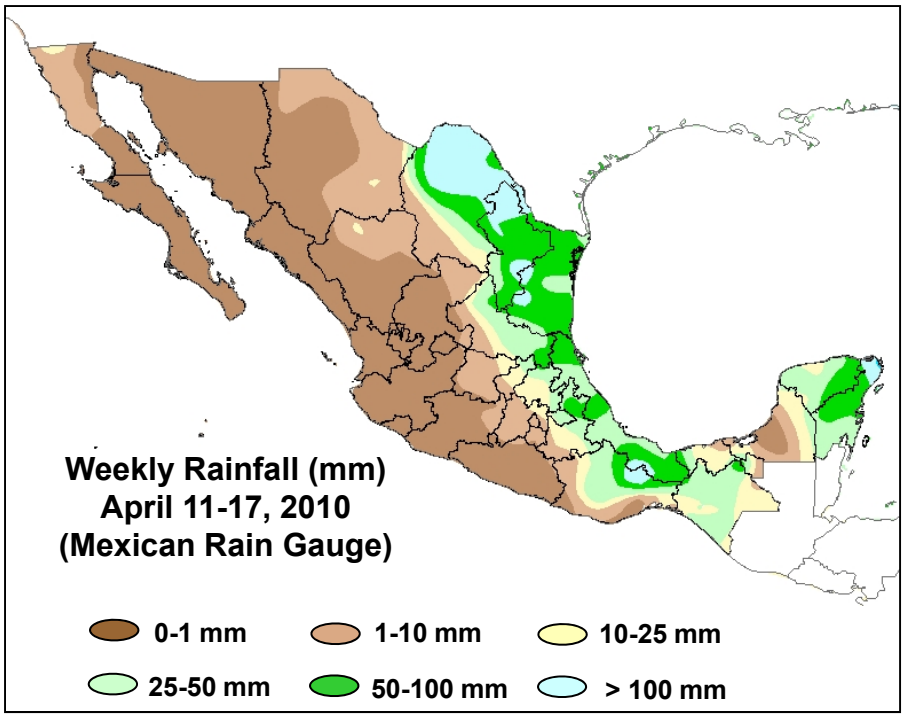


The maps above highlight the differences that arise using WMO data, which are sparse in coverage, versus the supplemental rain gauge data, which provides a denser network of stations and a better representation of rainfall.

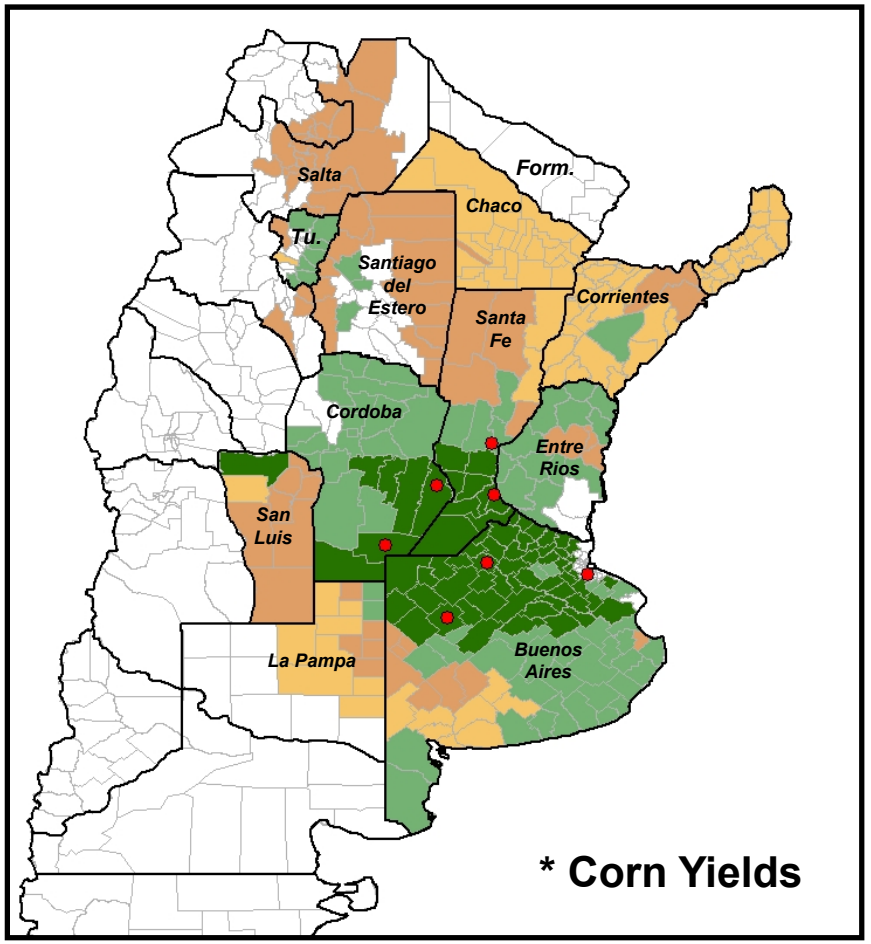
Data, Products, and Services (in support of WAOB/JAWF)

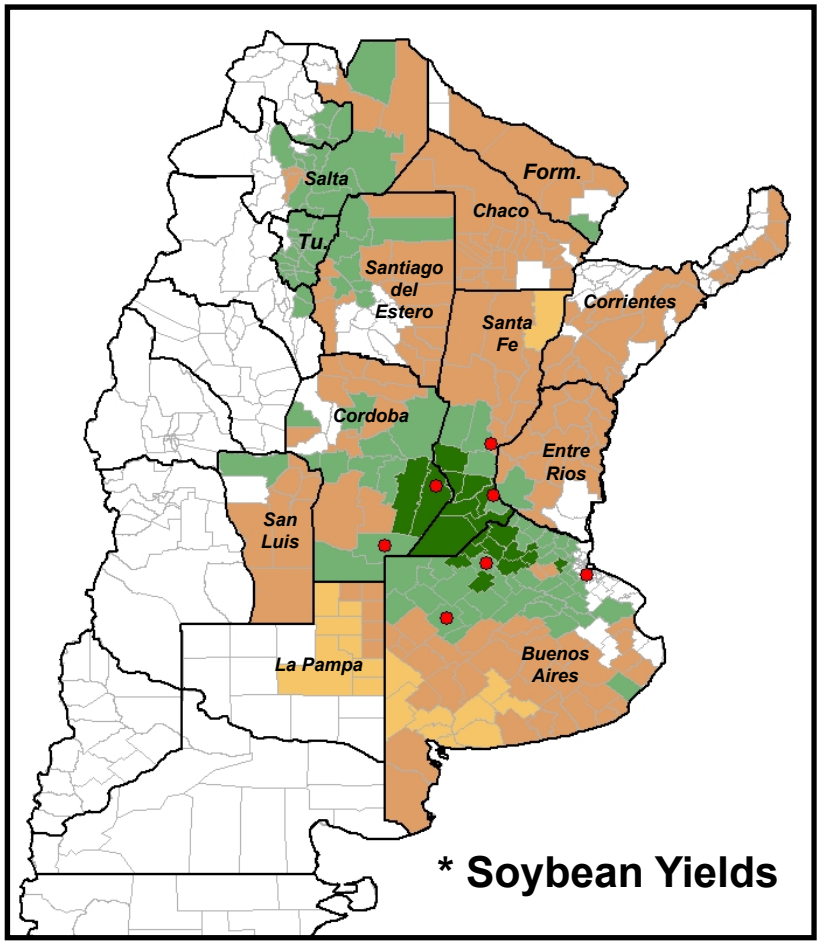
Validation using existing GIS products





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





Yields
***Average (2005/06-09/10)**

Stations in "Main Crop Area"

Lower ***Production Intensity*** **Higher**

***Source: SAGPyA**

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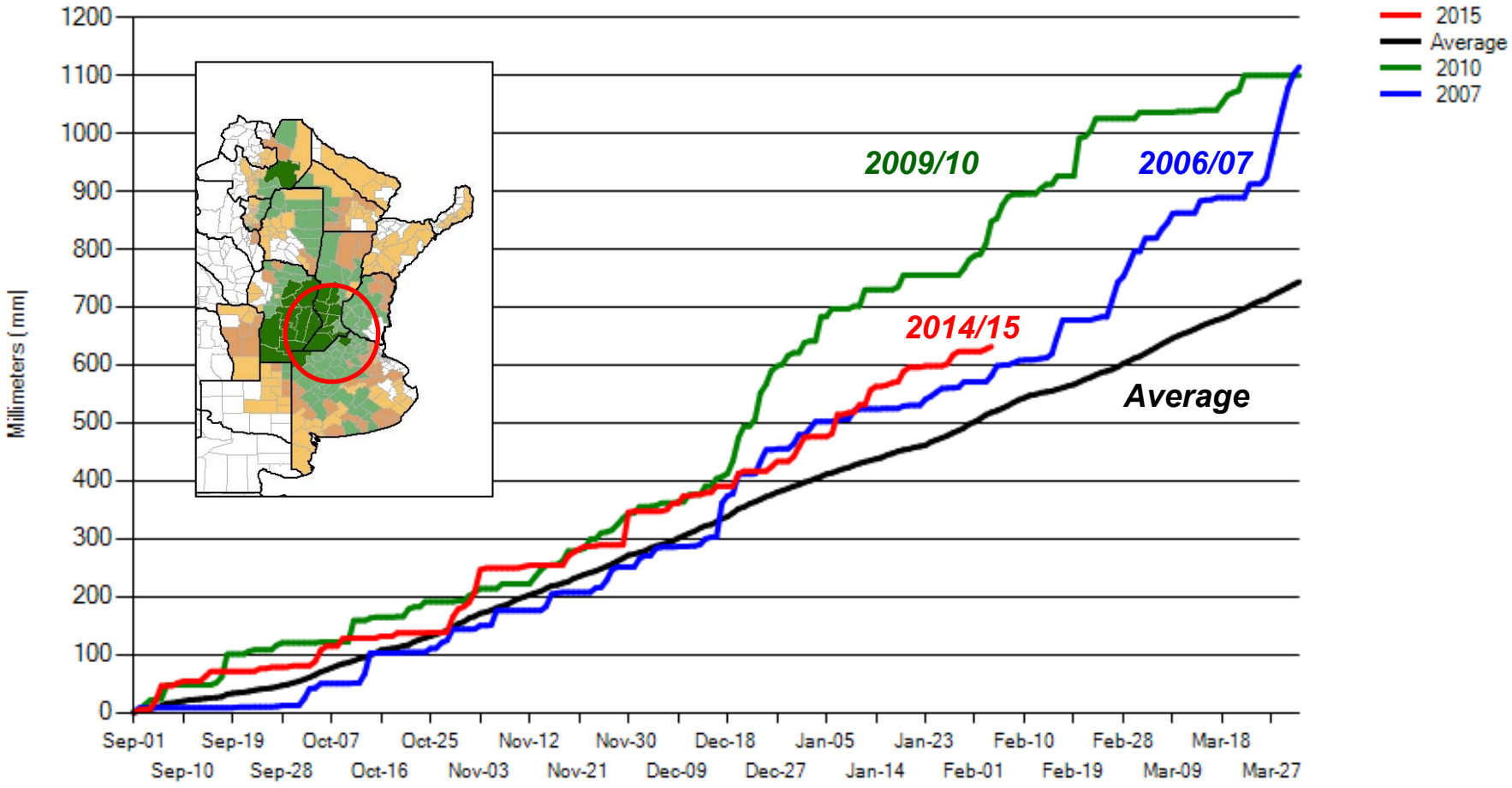
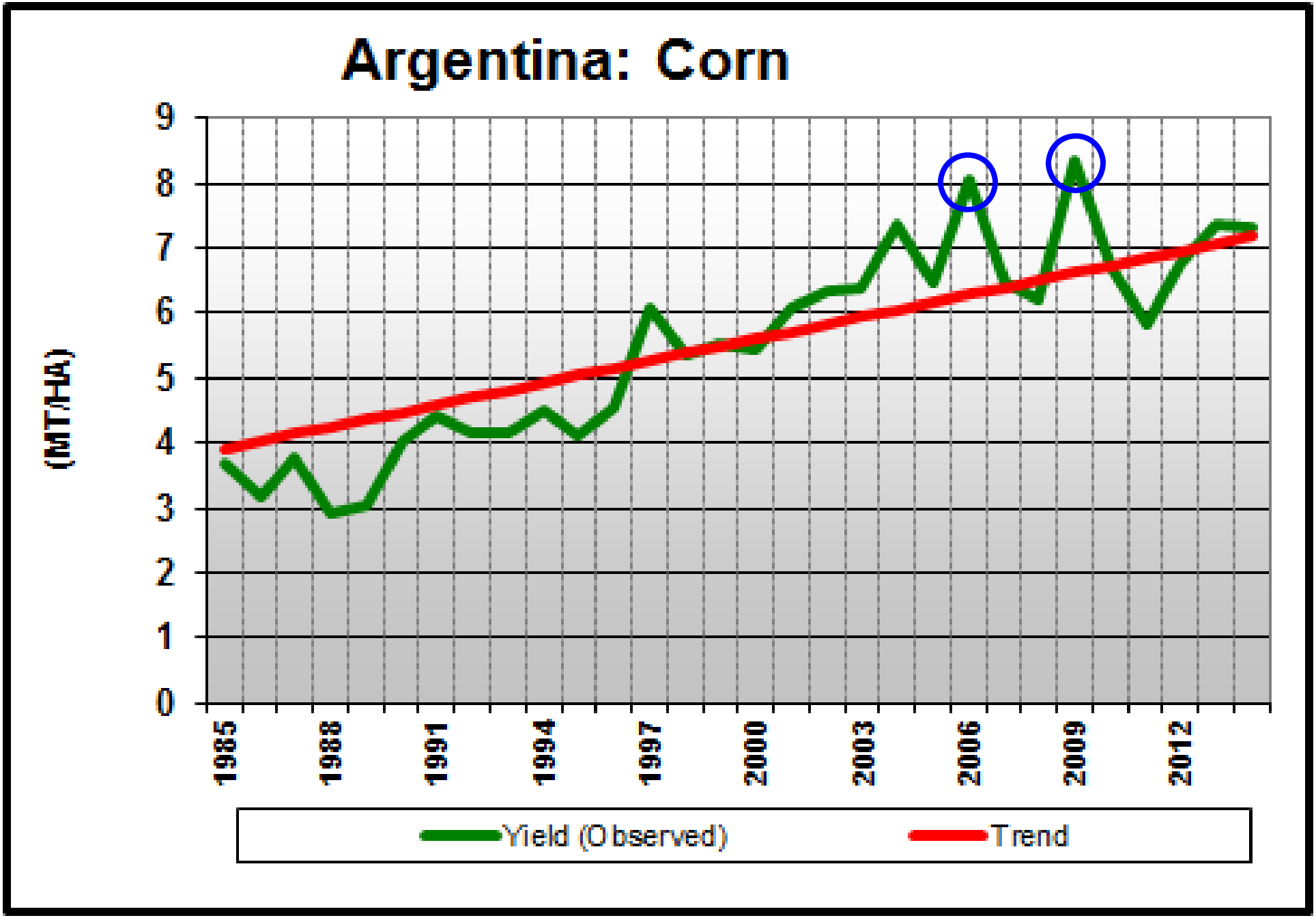
6 - MAIN CROP AREA

Cumulative Precipitation





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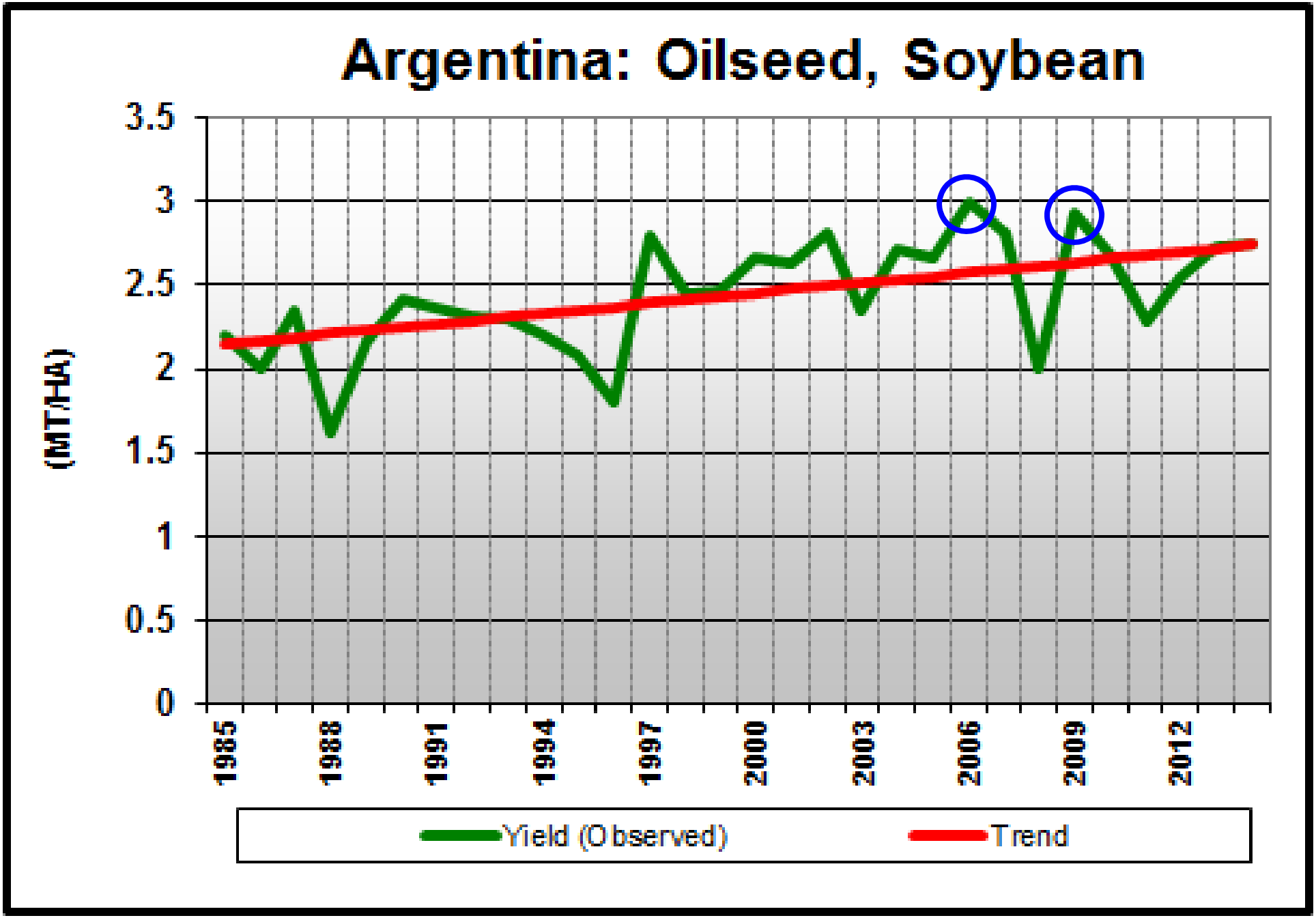

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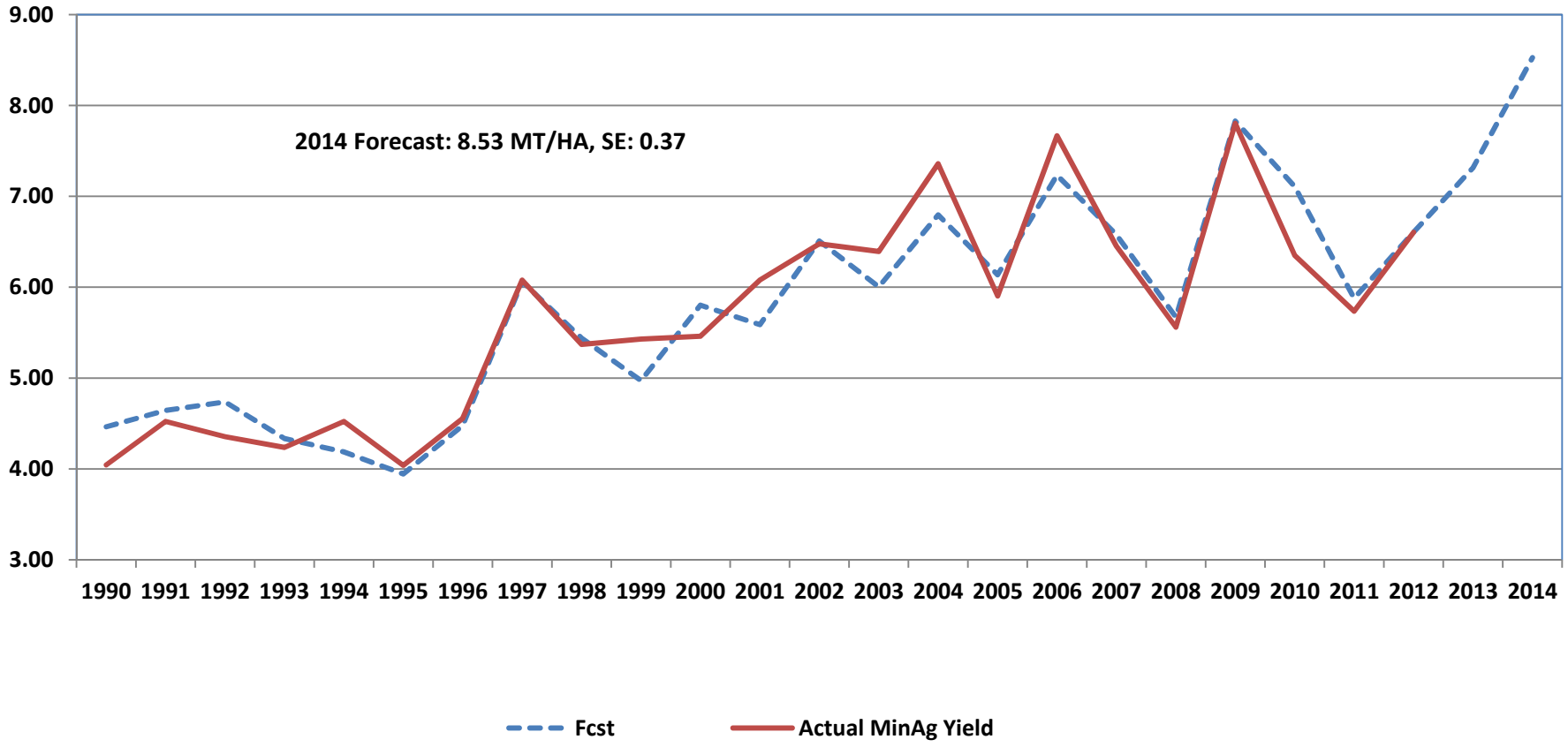
MT/HA

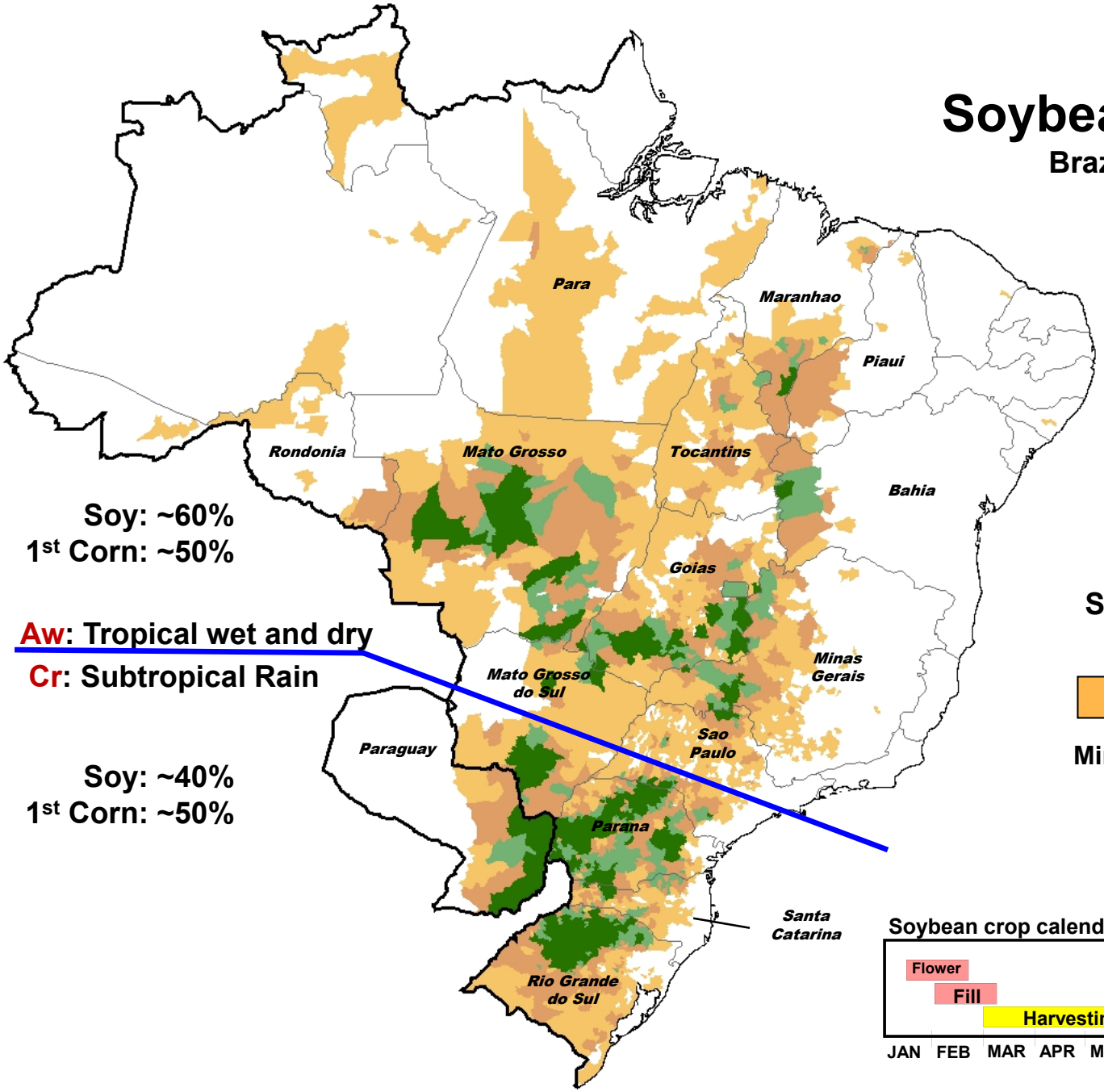
Argentina Corn Yield Actual vs. Forecast



Min Ag Yield f(trend, 2012 Dummy, Dec-Jan Avg Temp, Dec-Jan Total Pcp, 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%

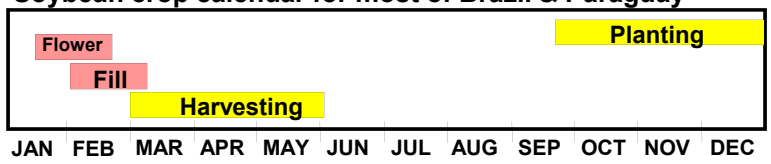
Soybean Production

*Average (2005-09)

Minor — *Production Intensity* → Major

*Source: MINAG / IBGE

Soybean crop calendar for most of Brazil & Paraguay



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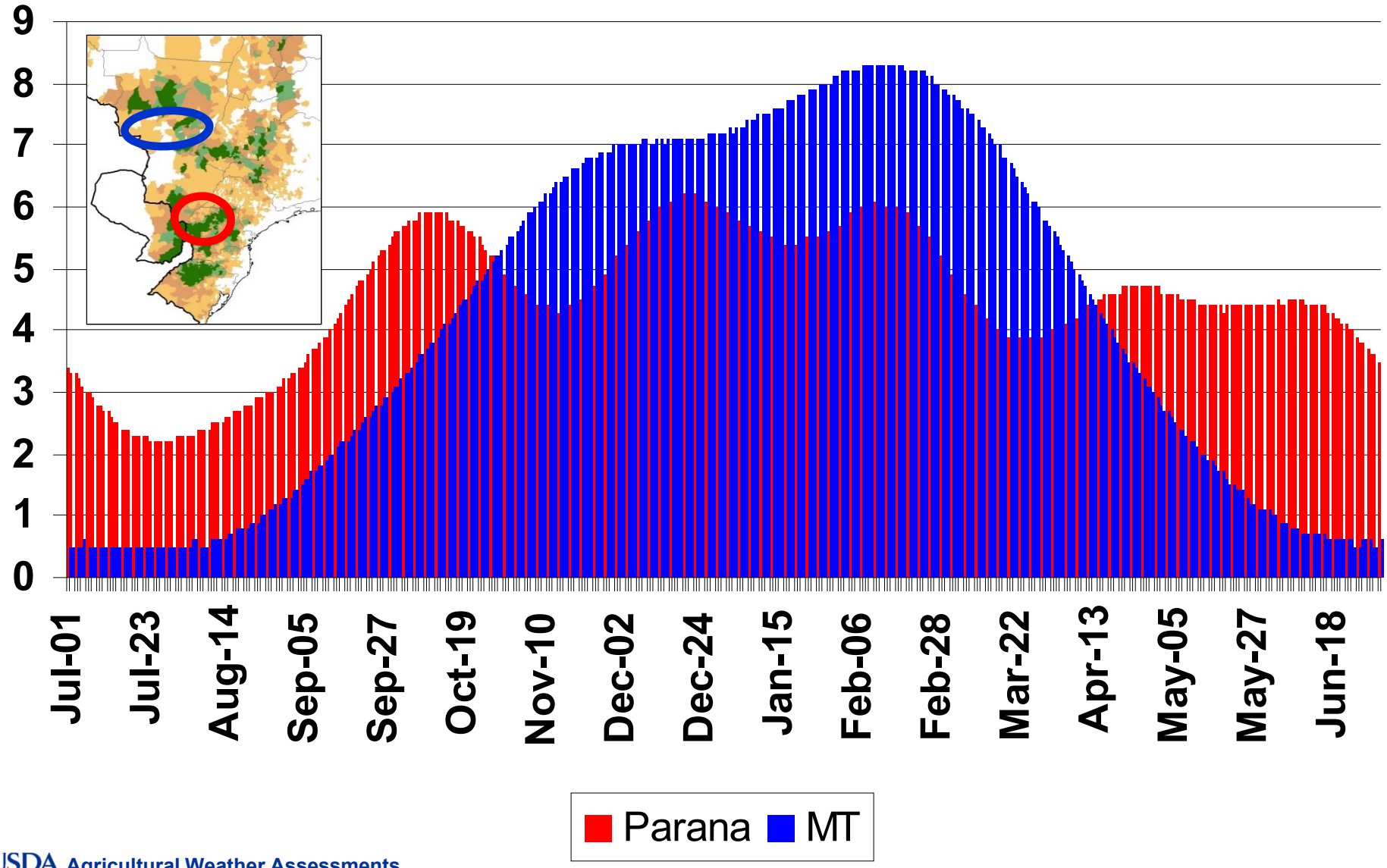
Brazil: Normal Daily Rainfall (mm)



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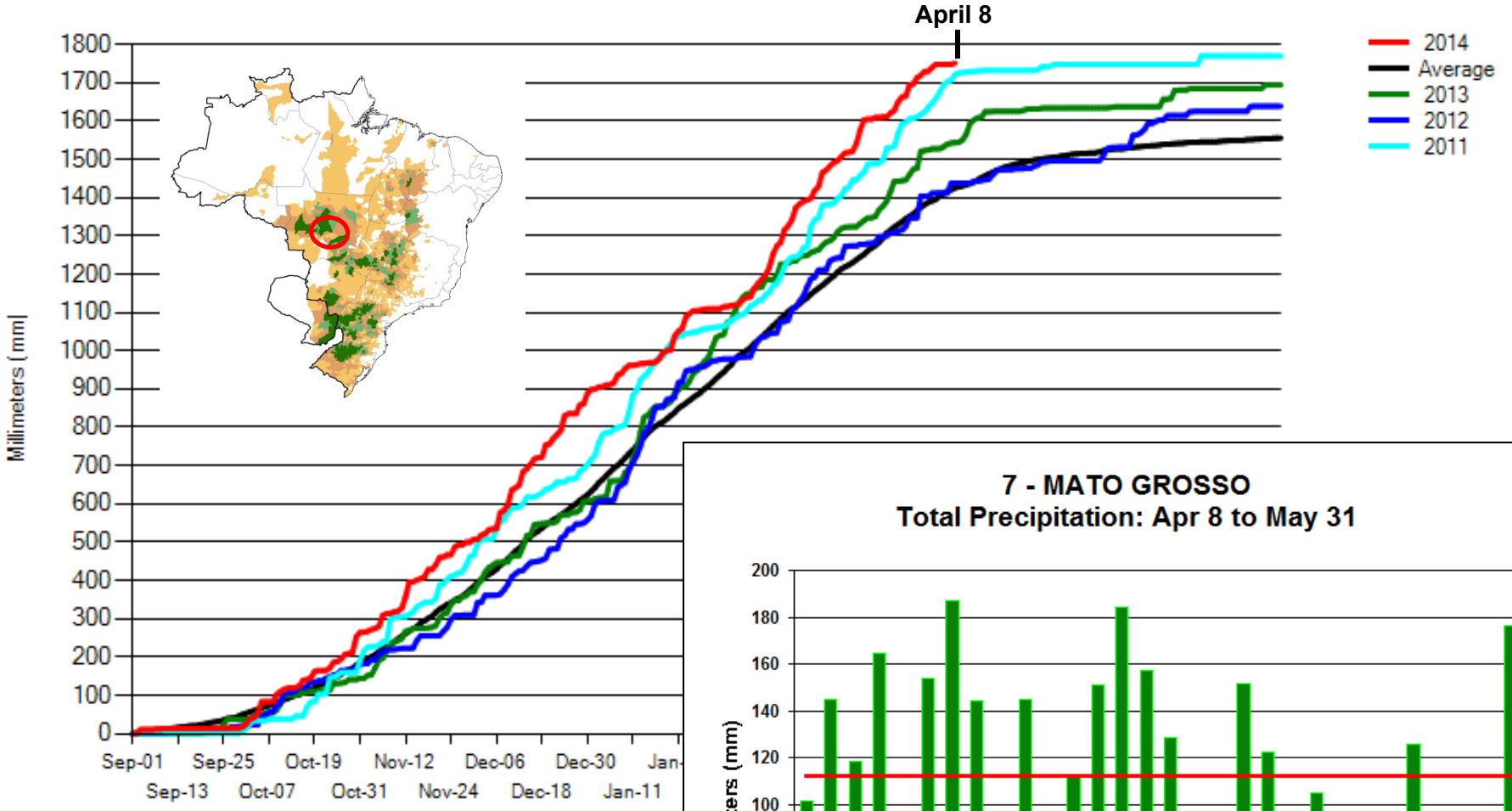
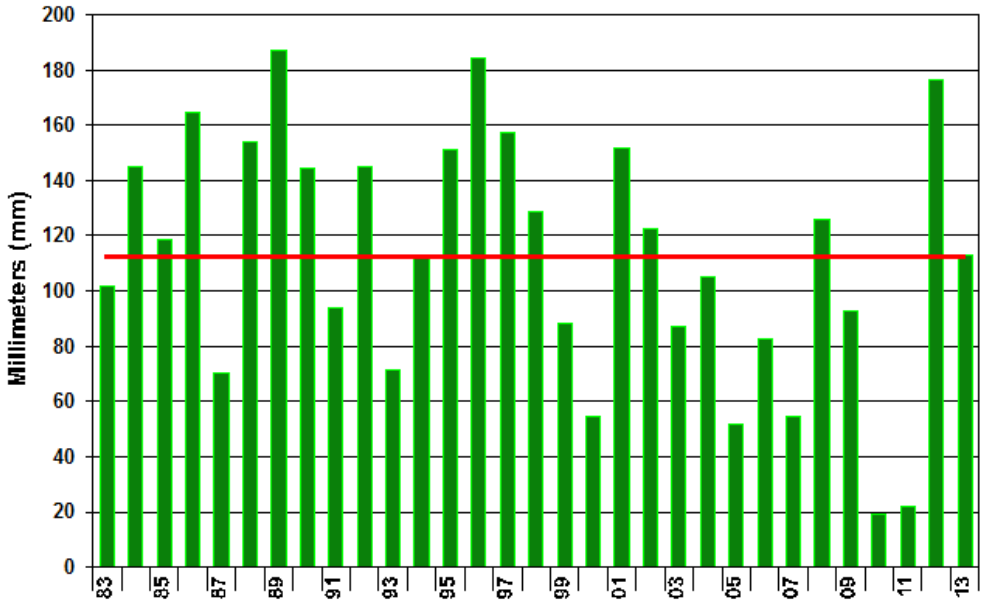
7 - MATO GROSSO

Cumulative Precipitation



7 - MATO GROSSO

Total Precipitation: Apr 8 to May 31



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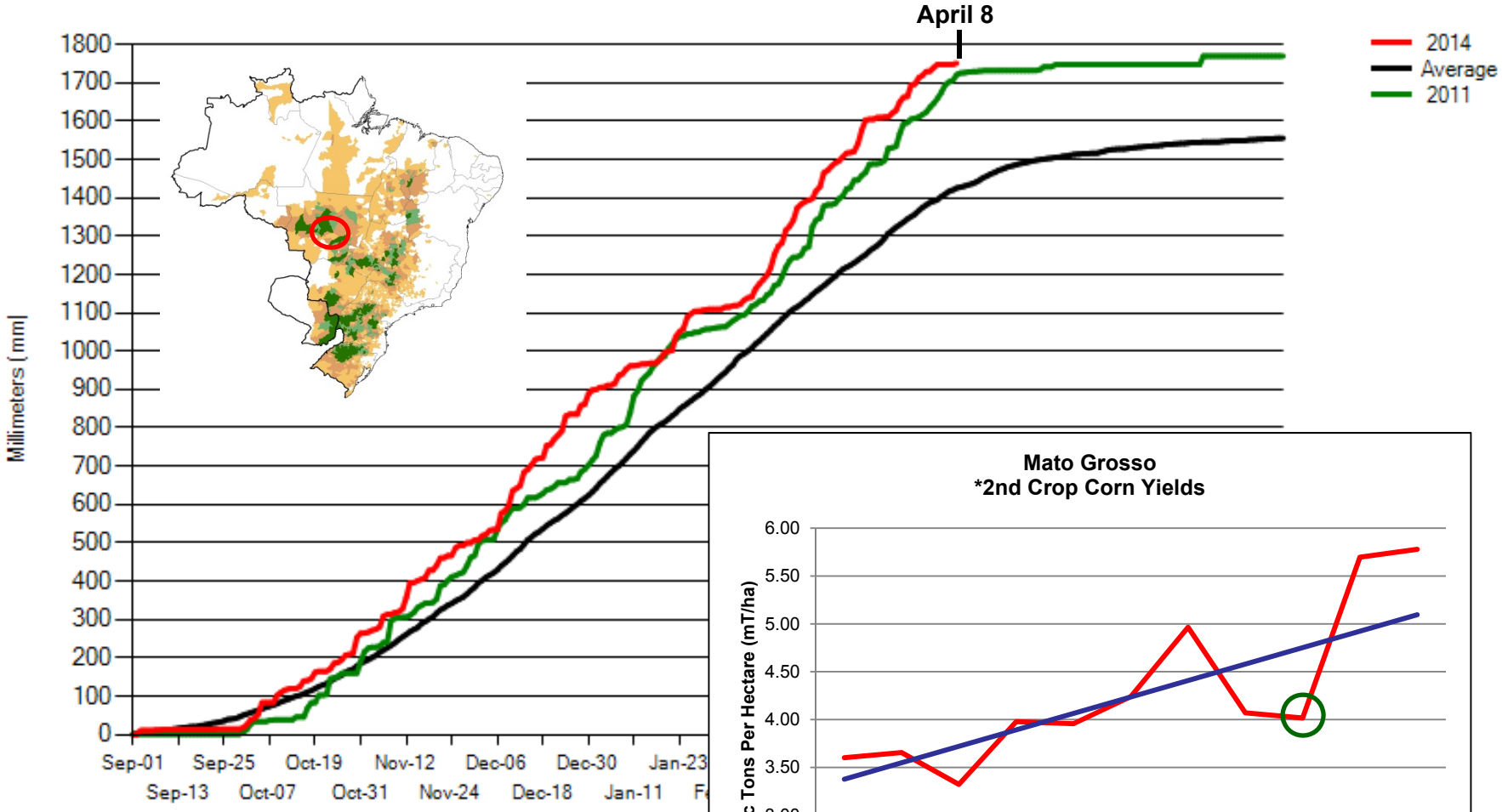
7 - MATO GROSSO

Cumulative Precipitation



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

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

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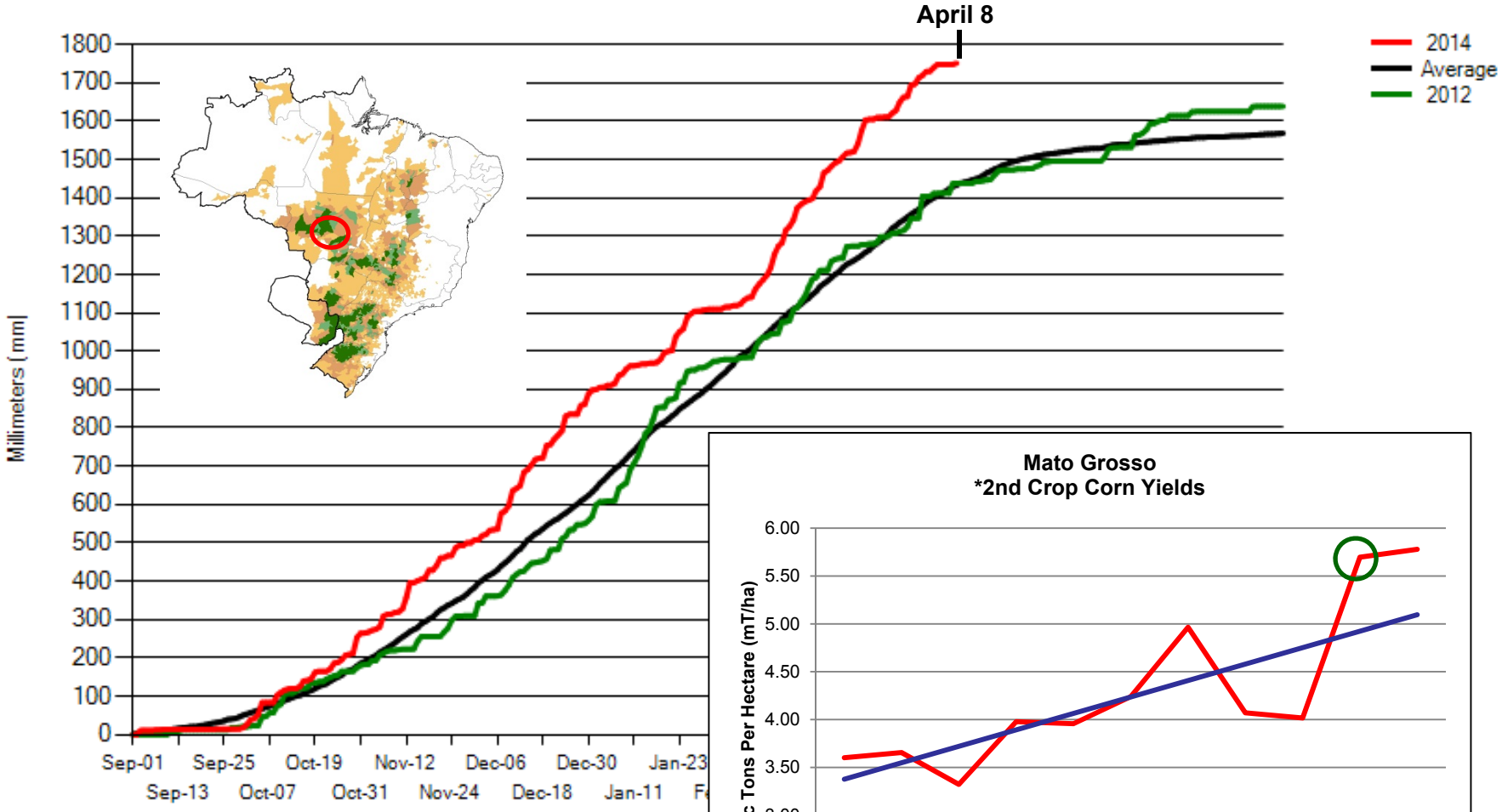
7 - MATO GROSSO

Cumulative Precipitation



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

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

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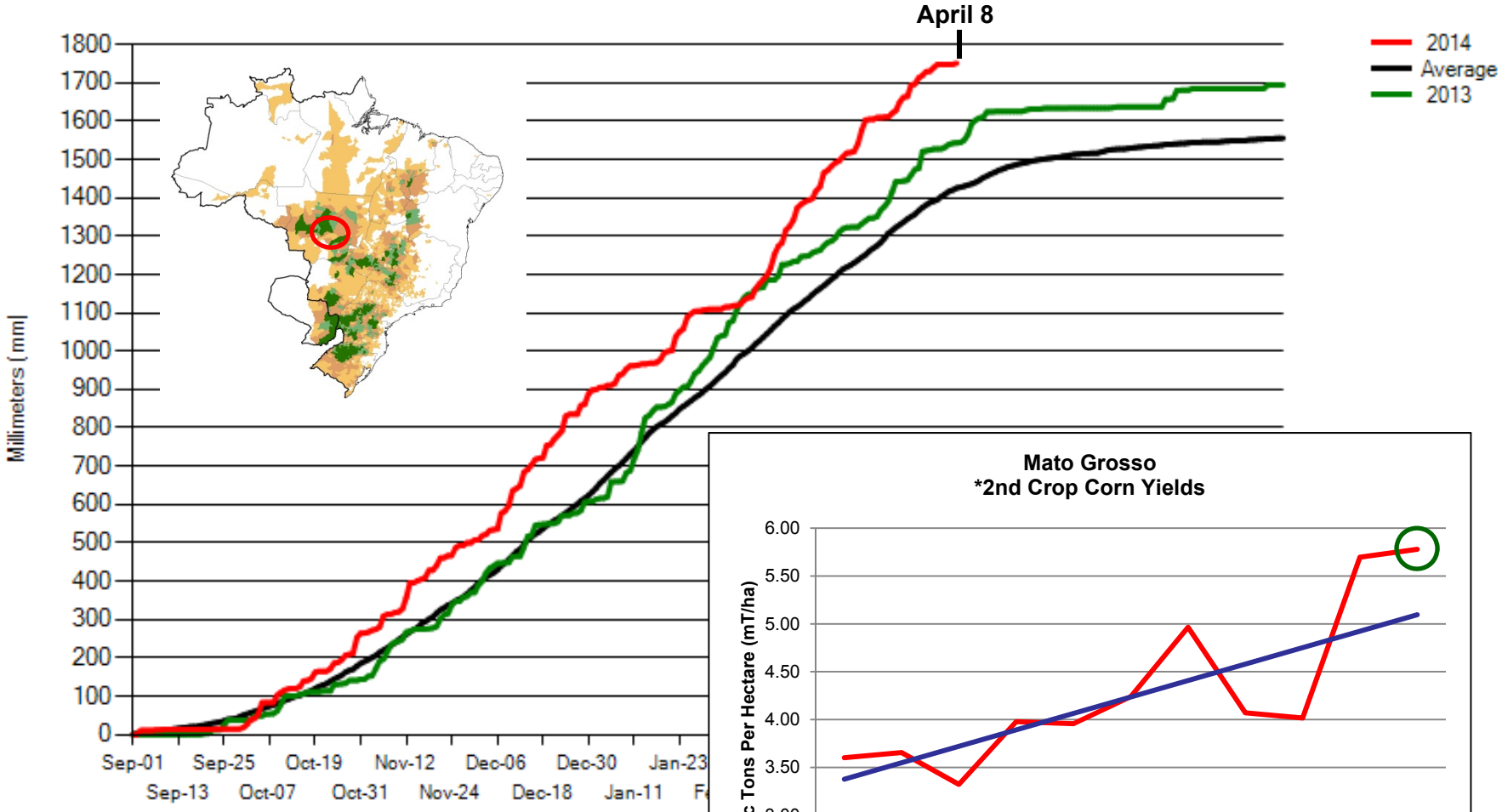
7 - MATO GROSSO

Cumulative Precipitation



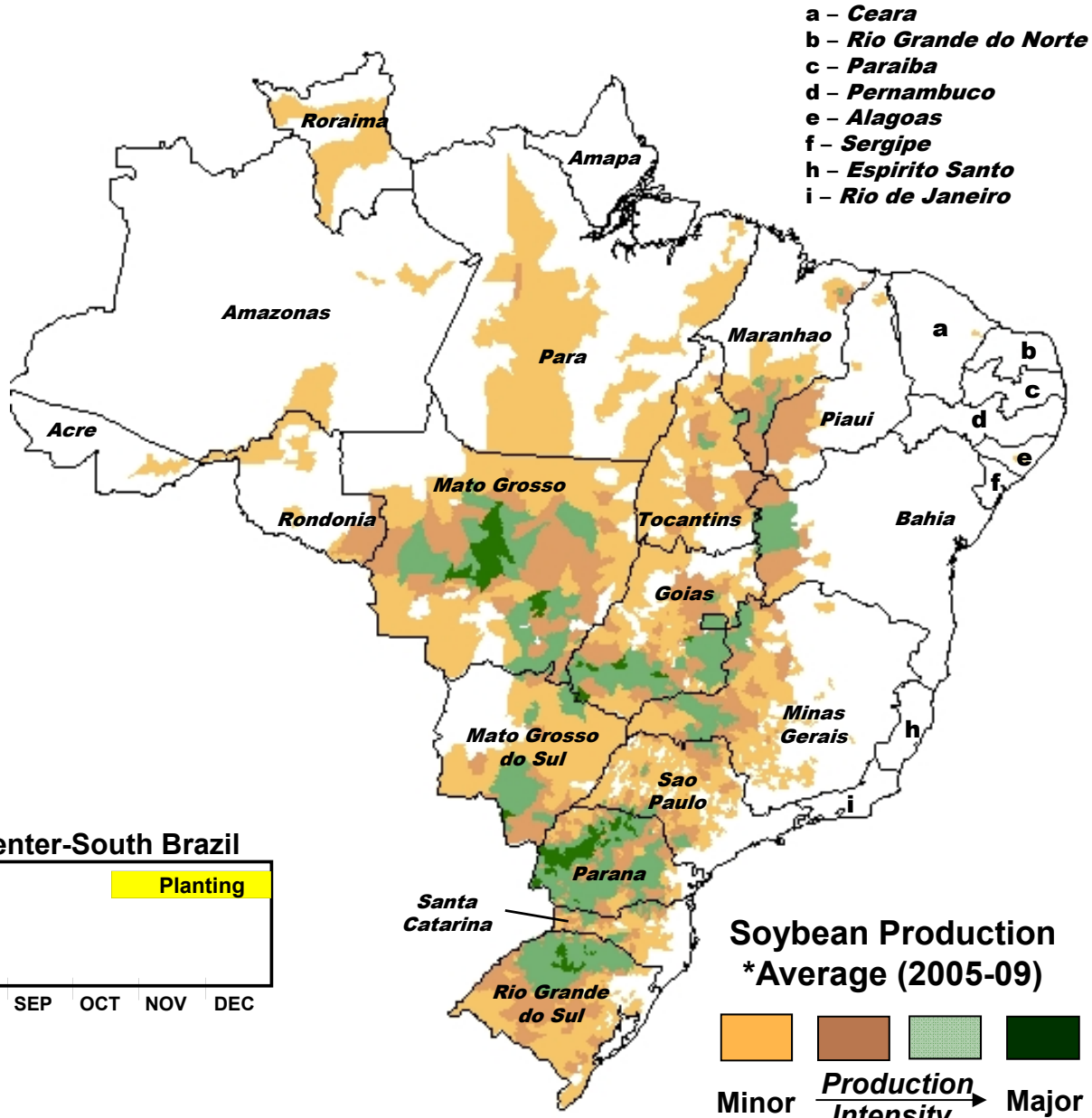
2013: Above-normal rainfall, then scattered showers in May

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

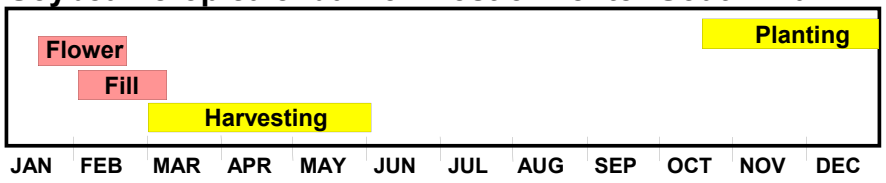
Brazil Soybeans

* 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



Soybean crop calendar for most of Center-South Brazil



*Source: IBGE

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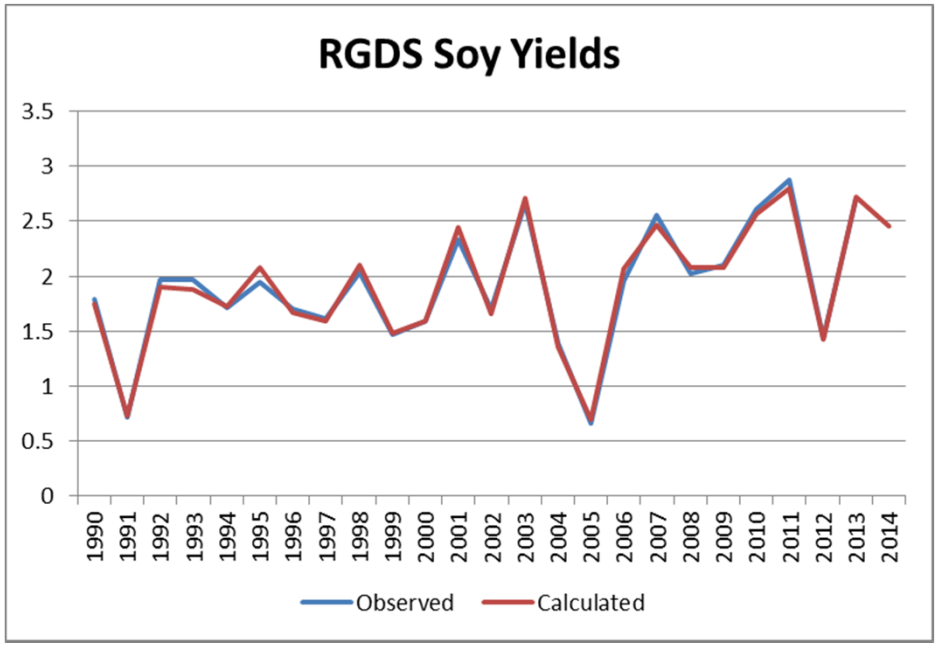
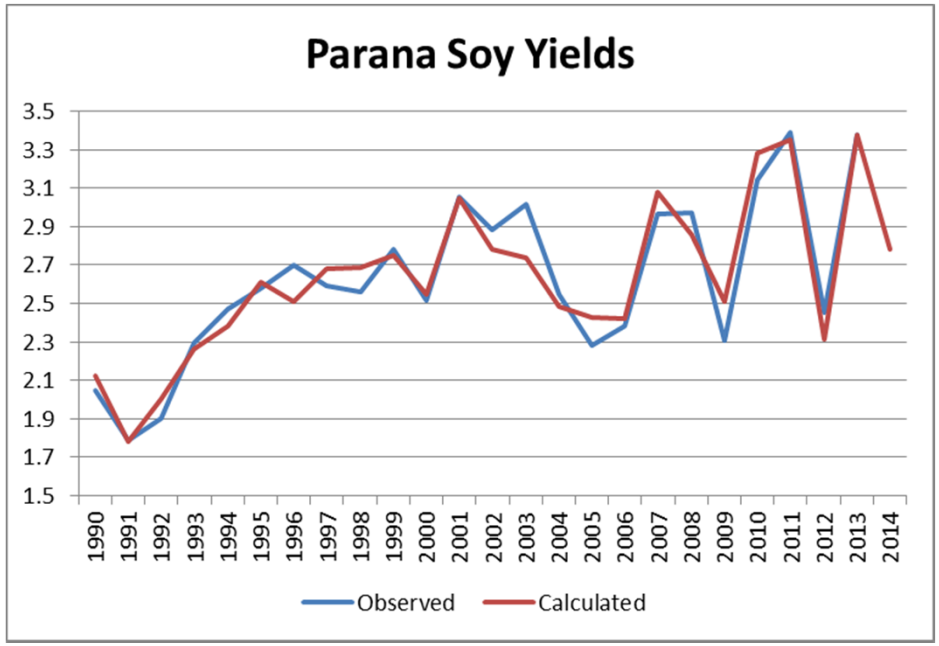




Elements: Average Temperature, Days >=35°C, Precipitation, Days Between Rainfall

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

Estimated yield: 2.54 mT/ha

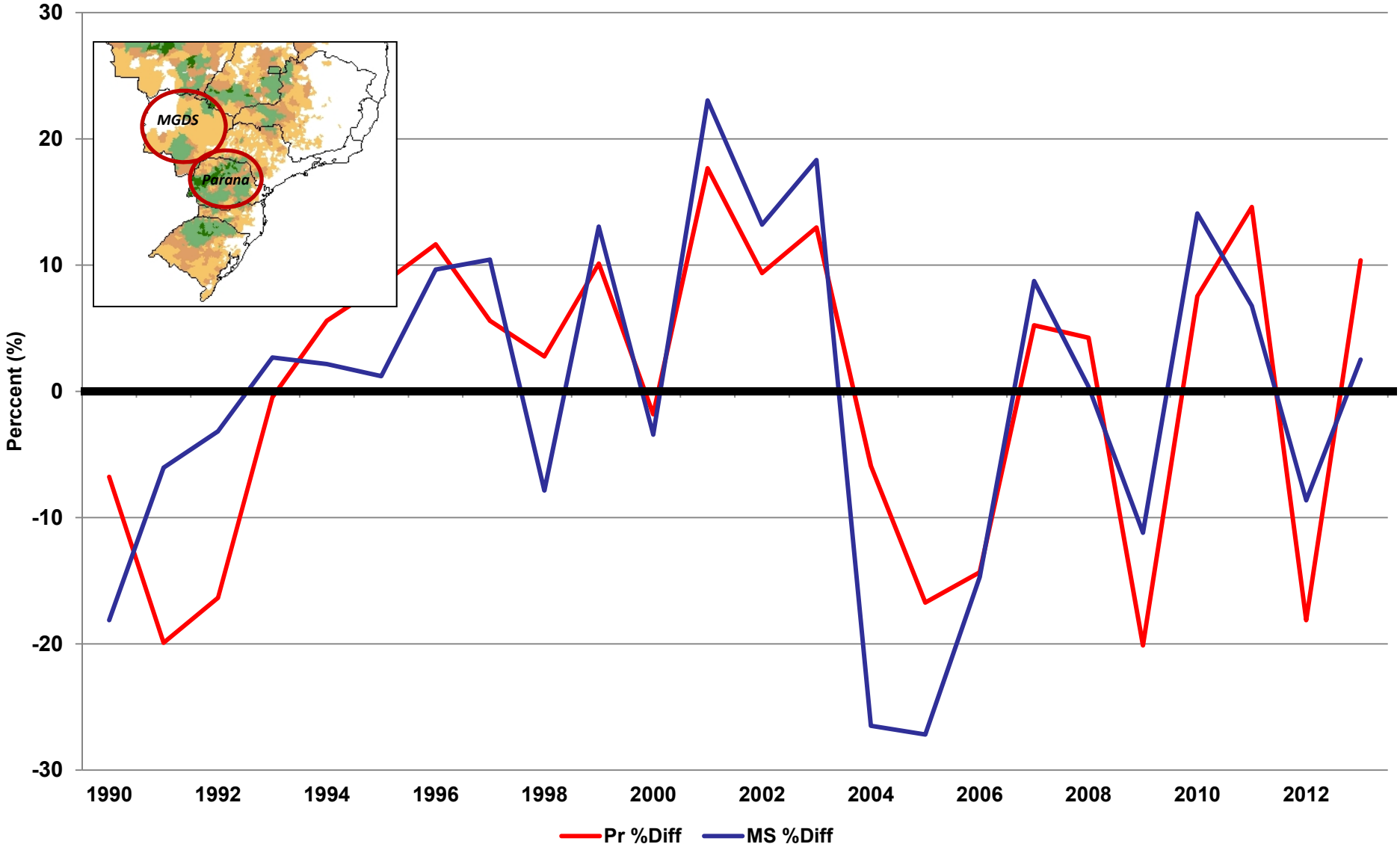
March Lockup: 2.45 mT/ha

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



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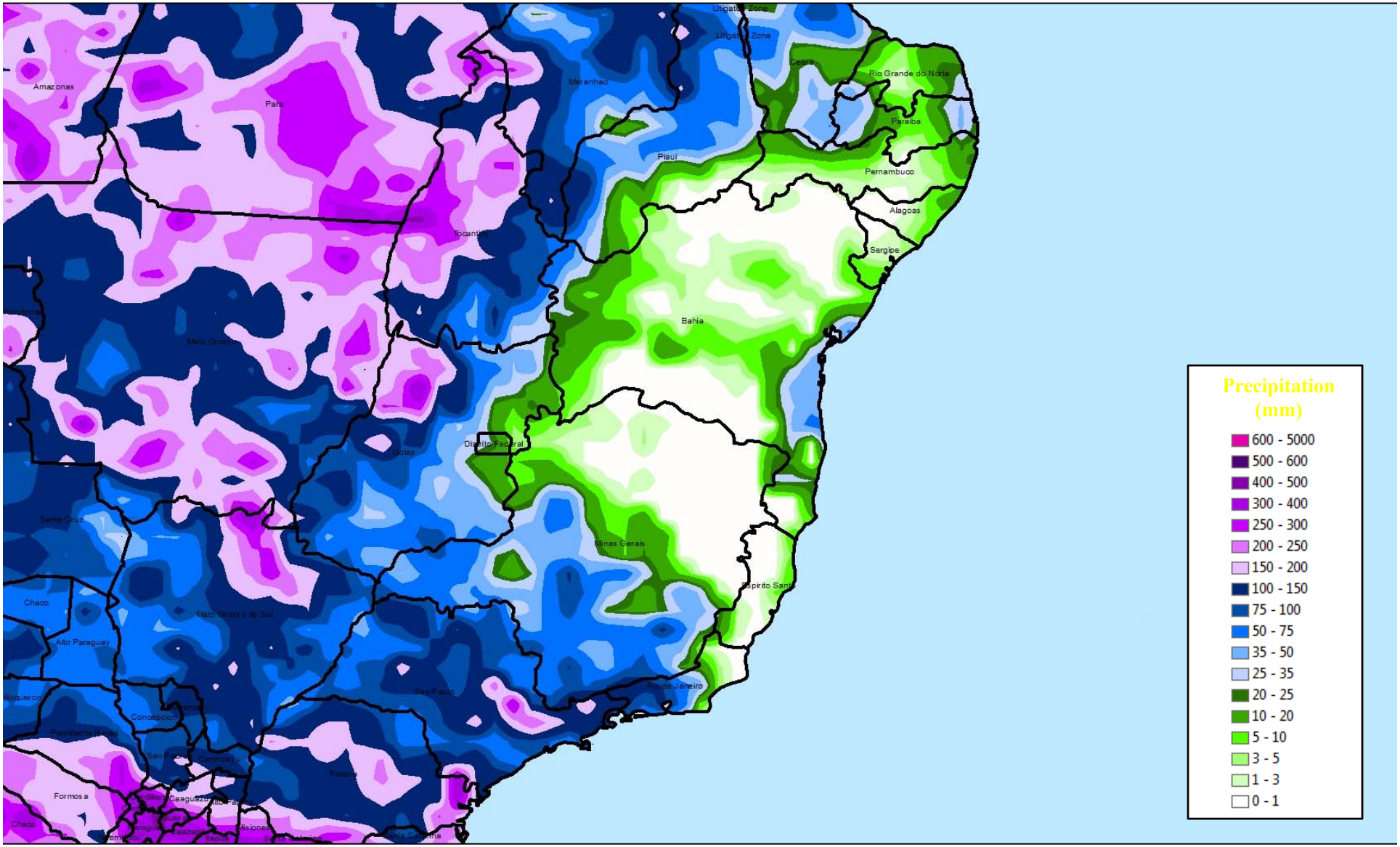
Blended Precipitation (CMORPH & WMO): Jan 1-21, 2015



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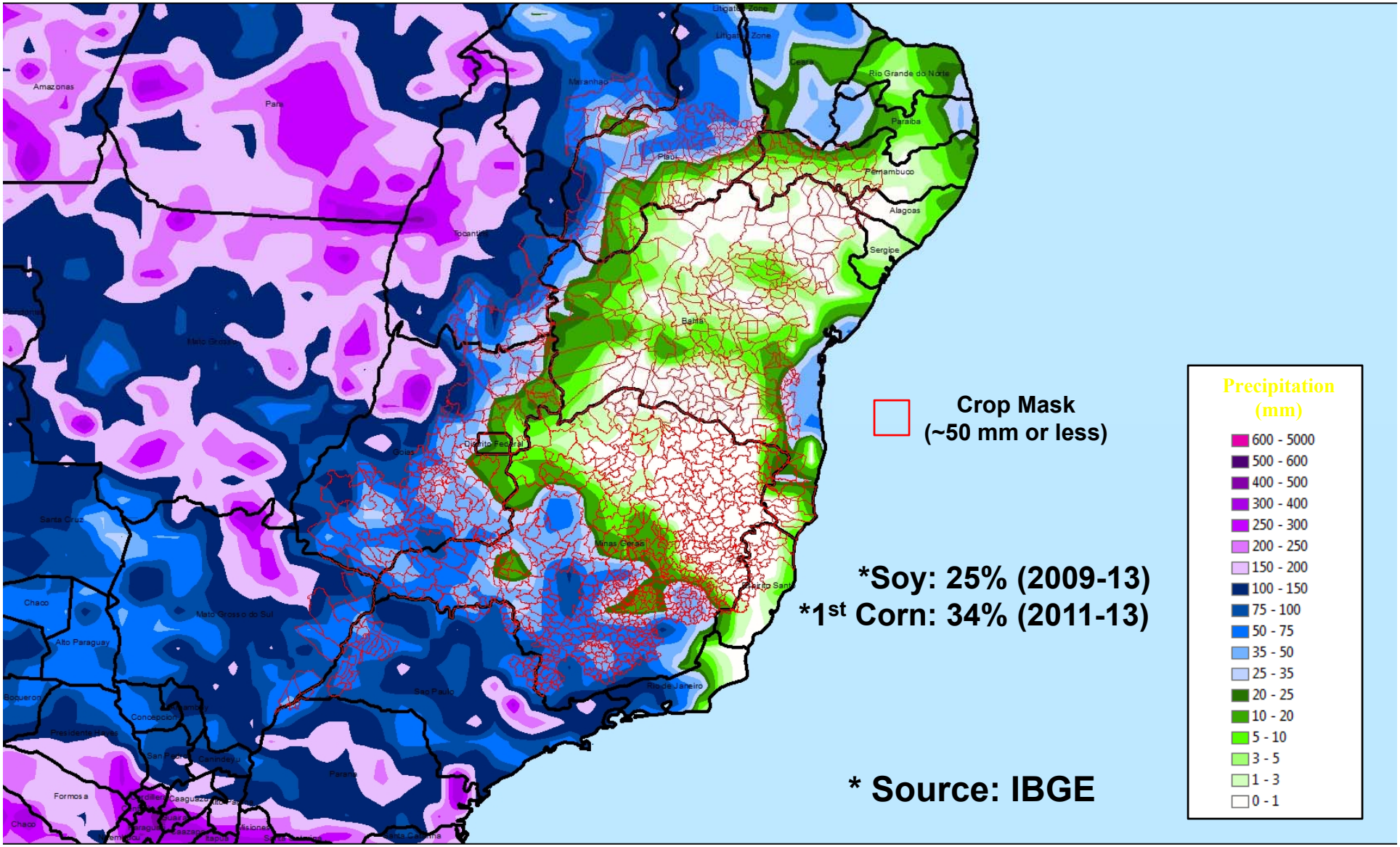
Blended Precipitation (CMORPH & WMO): Jan 1-21, 2015



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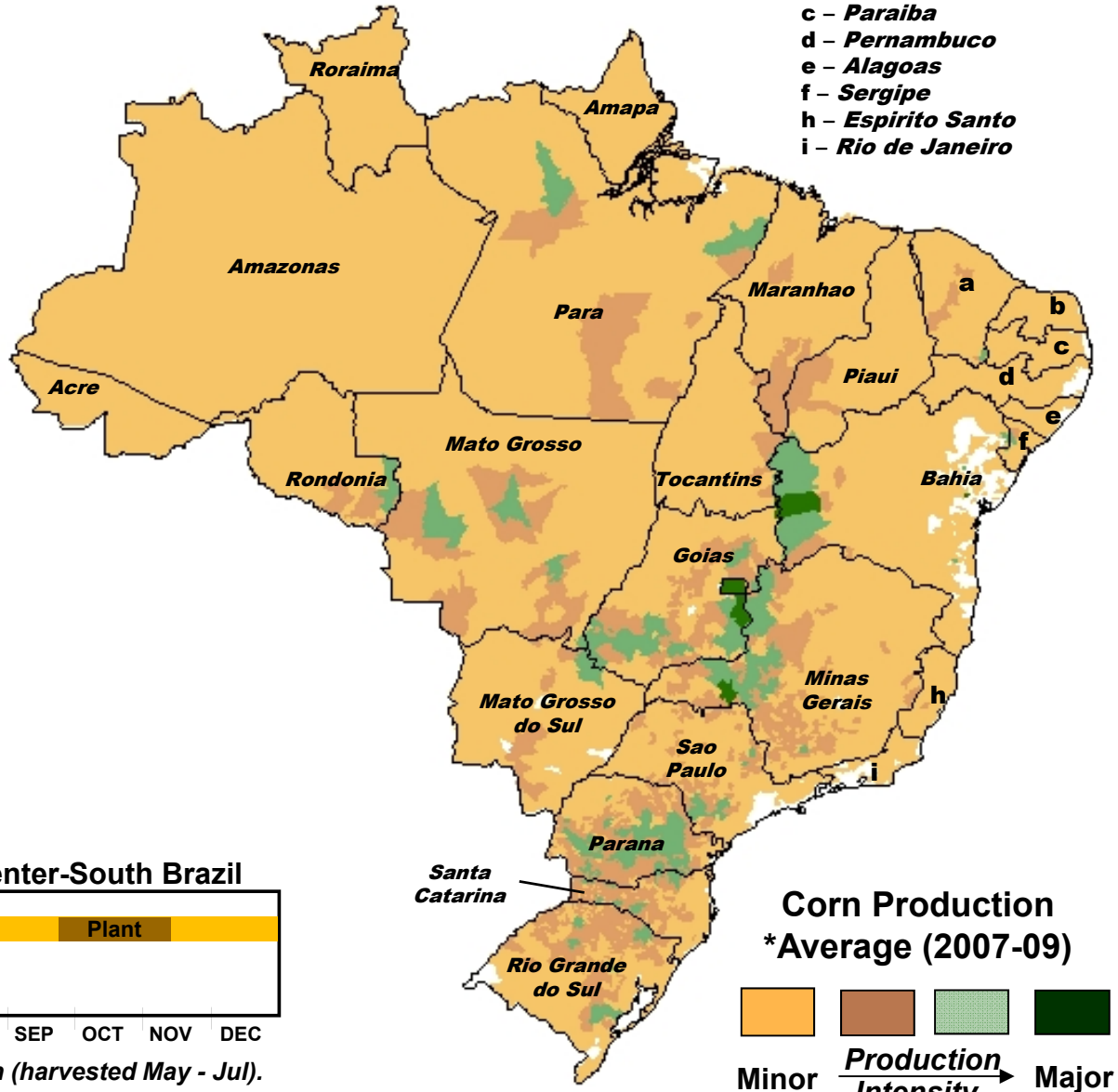
Brazil Corn (First Crop)

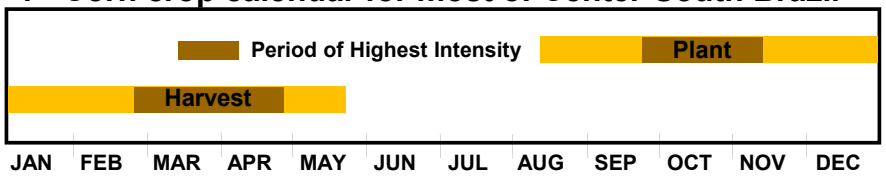
* State-Level Production (as % of total)	
Parana	23
Minas Gerais	17
Rio Grande do Sul	14
Santa Catarina	10
Sao Paulo	10
Goias	9
Bahia	4
Mato Grosso	3
Para	2
Mato Grosso do Sul	2
Ceara	2
Sergipe	1
Maranhao	1
Other States	~4

* 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*



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



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

Corn Production
*Average (2007-09)

Minor — *Production Intensity* → Major

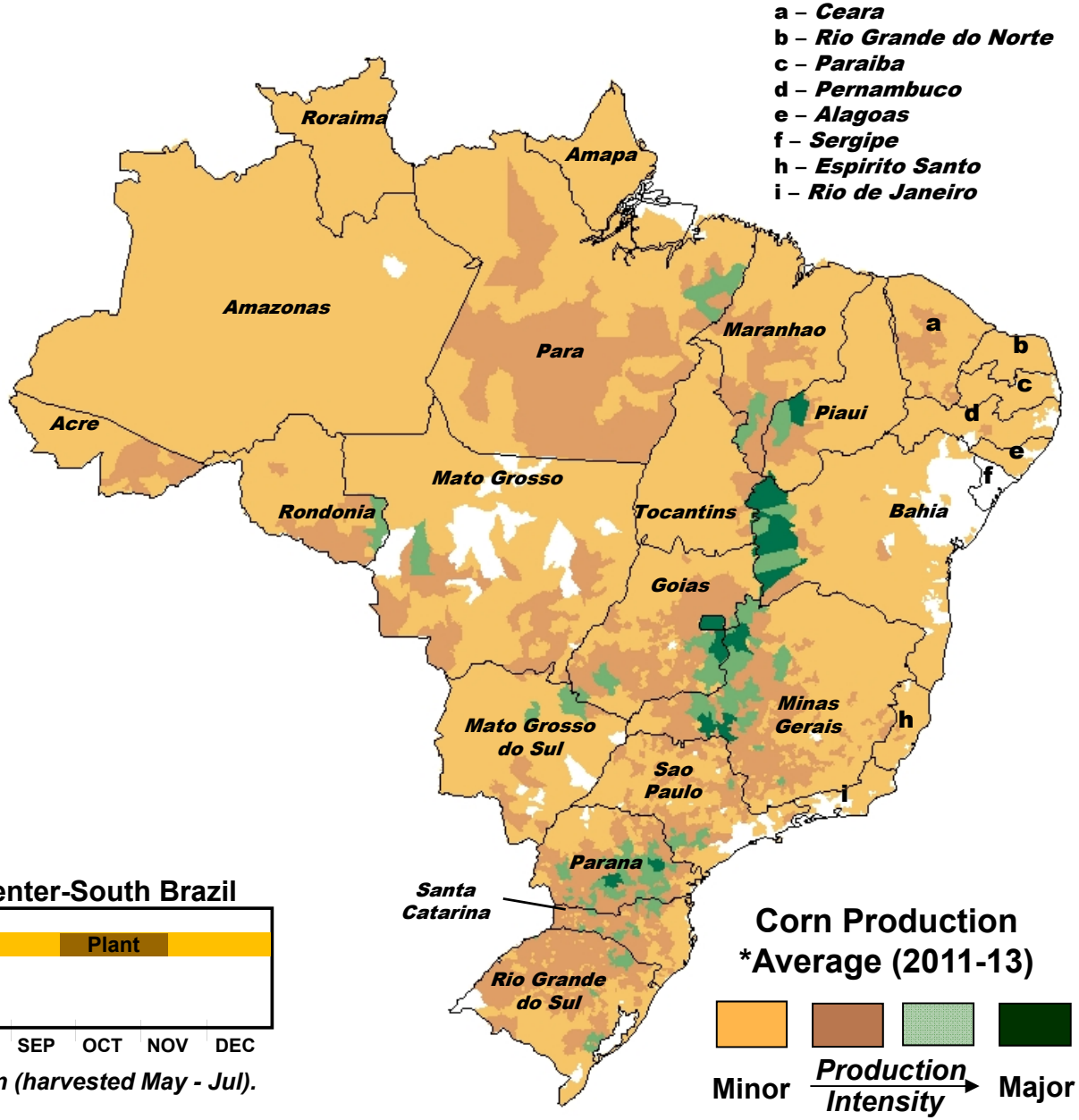
*Source: IBGE

USDA Agricultural Weather Assessments
World Agricultural Outlook Board

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



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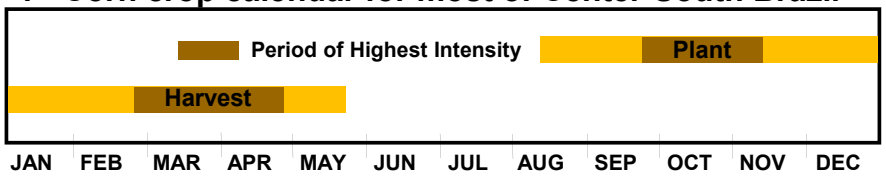

In Northeast Brazil, 1st crop planted Dec - Jan (harvested May - Jul).

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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.

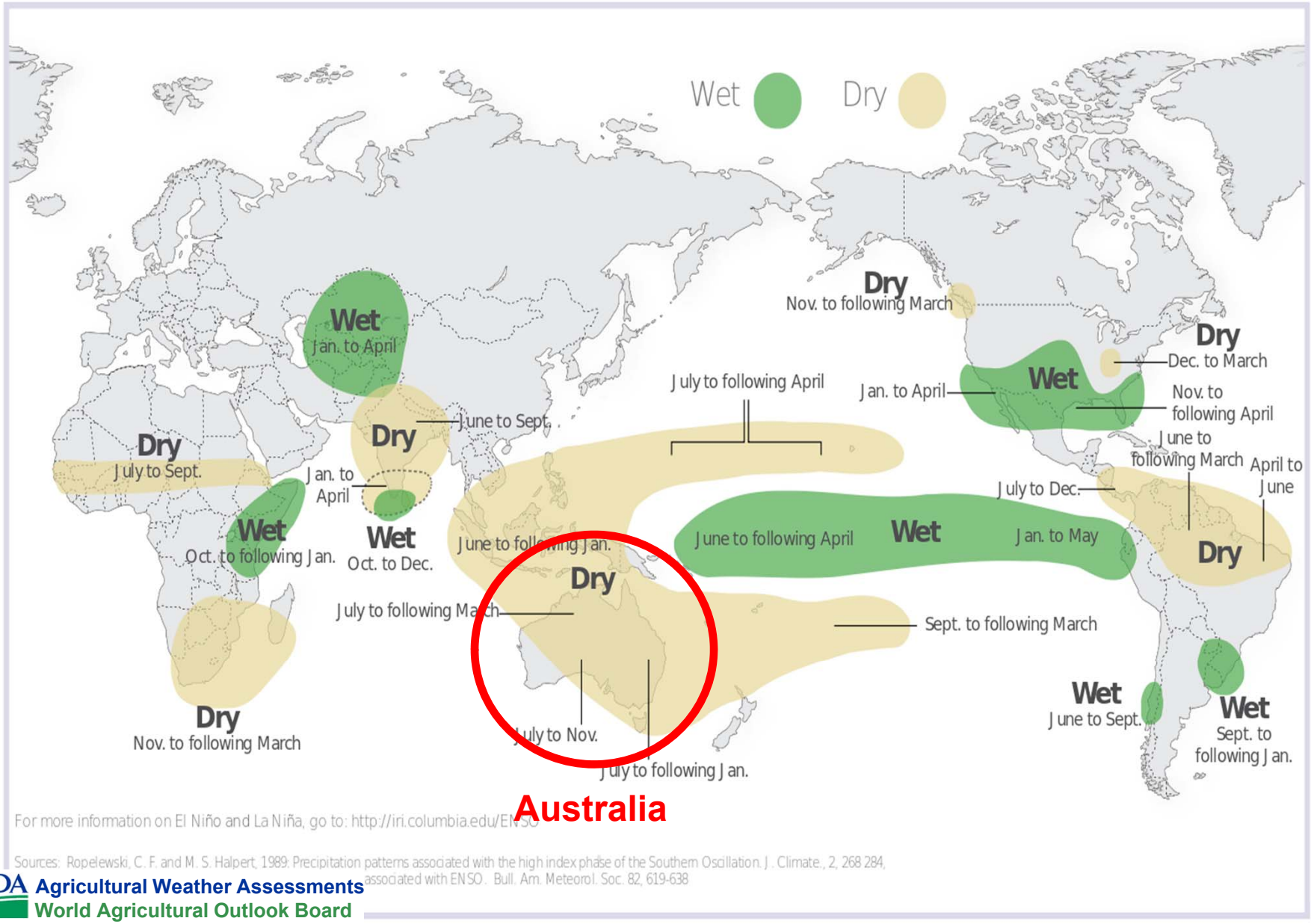
It could also worsen drought conditions in Thailand, a leading rice exporter.

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.

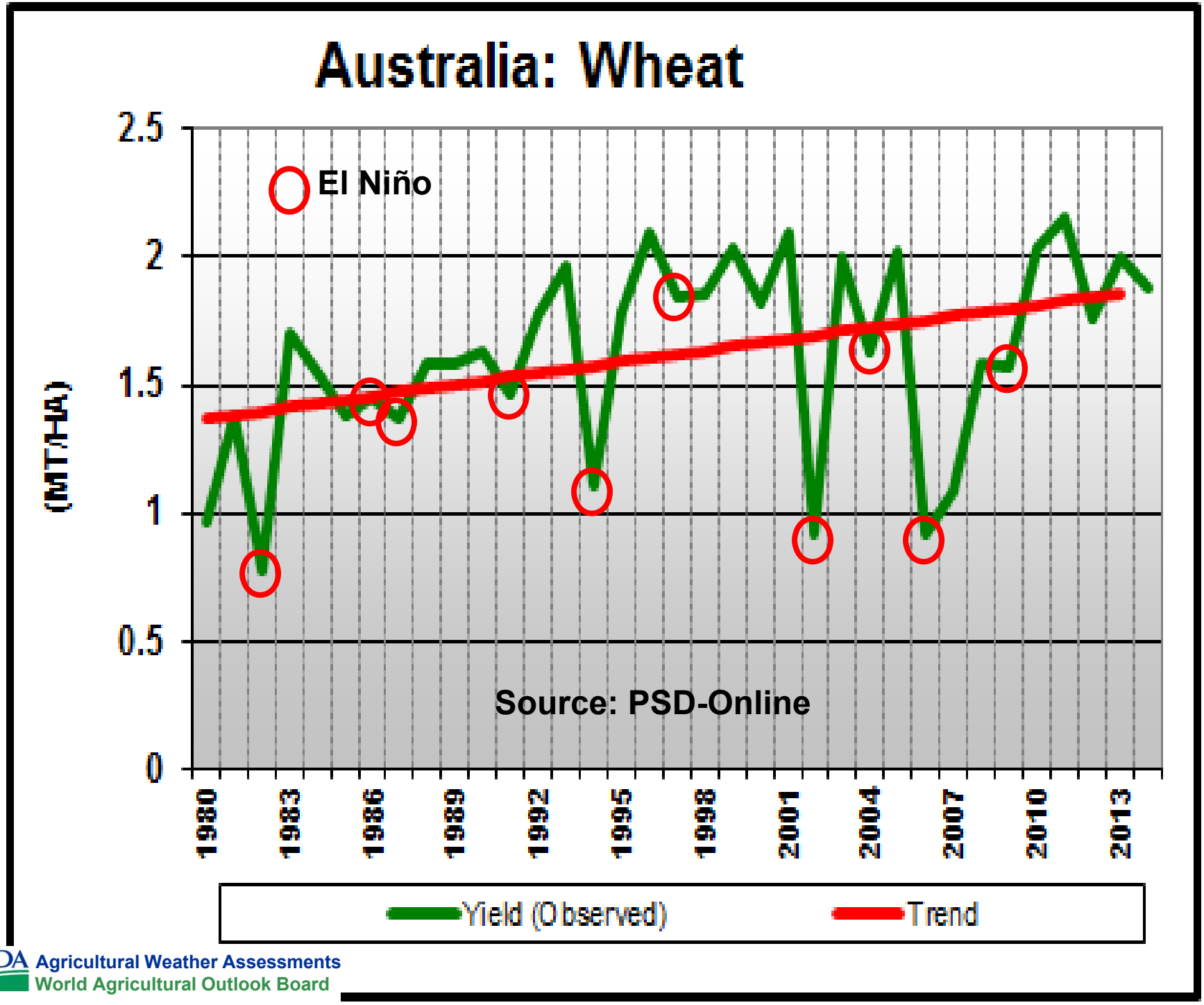
El Niño and Rainfall

El Niño conditions in the tropical Pacific are known to shift rainfall patterns in many different parts of the world. Although they vary somewhat from one El Niño to the next, the strongest shifts remain fairly consistent in the regions and seasons shown on the map below.



For more information on El Niño and La Niña, go to: http://iri.columbia.edu/ENSO

Sources: Ropelewski, C. F. and M. S. Halpert, 1989: Precipitation patterns associated with the high index phase of the Southern Oscillation. J. Climate., 2, 268 284, associated with ENSO. Bull. Am. Meteorol. Soc. 82, 619-638



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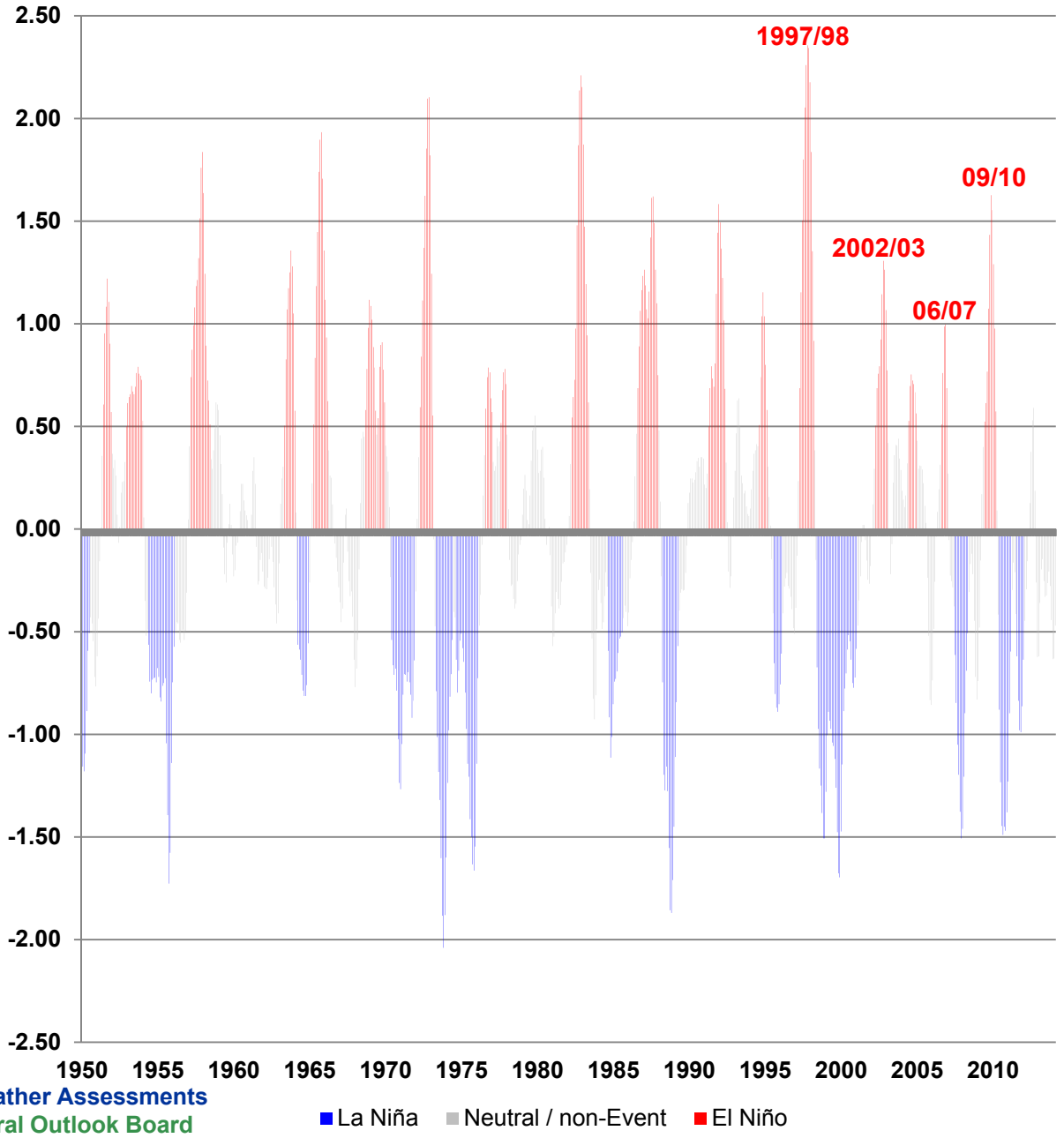
Sea Surface Temperature Anomalies (°C)
Niño Region 3.4



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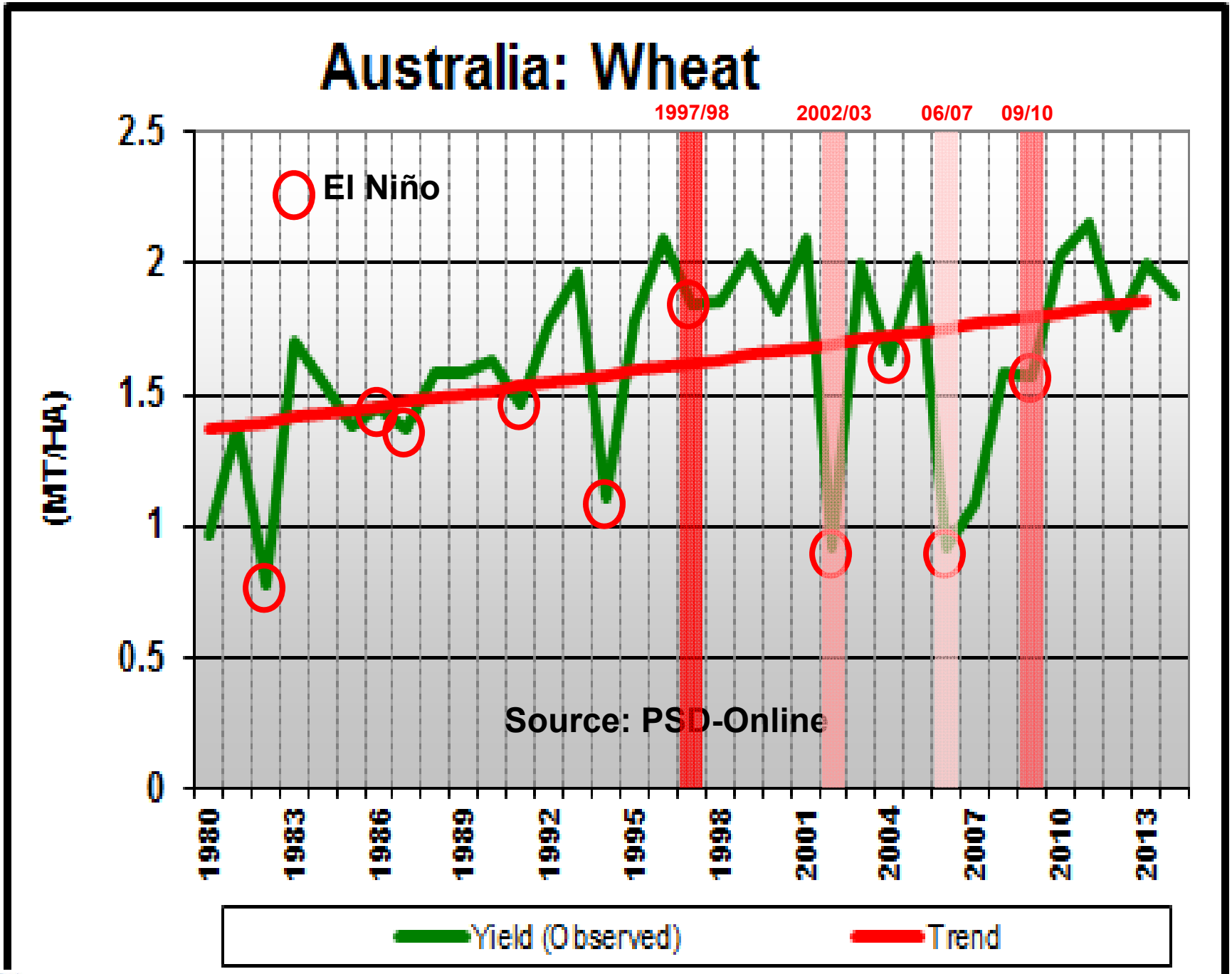

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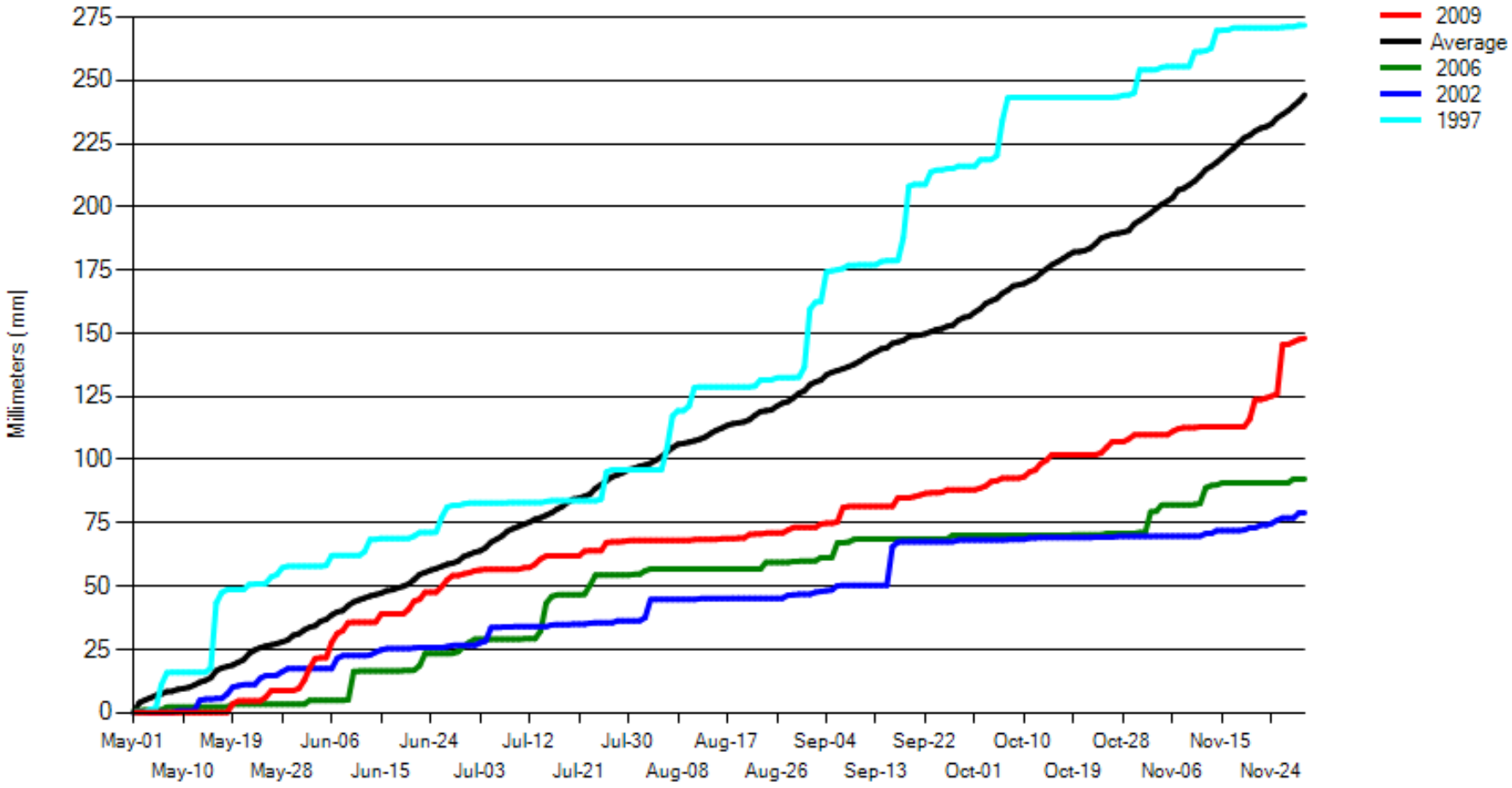
2 - NSW-WHEAT

Cumulative Precipitation



Thank You !

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