Staplcotn

United States Future as Global Cotton Supplier

USDA Outlook Forum 2024
Crawford Tatum

Overview

United States Future as Global Cotton Supplier????

I. Opening Remarks
II. How are food/fuel and fiber acres evolving?
  a) Acres trends – Is cotton competing for acres?
  b) Geography of food and fiber production and consumption
  c) Productivity trends
III. Man made fiber vs cotton
IV. Longer term look at USA cotton production
  a) Cost of production
  b) Market Volatility
  c) Weather considerations
  d) Will the USA remain a competitive exporter?

Changes in Key Metrics:

2001

World Population: 6.2 Billion

World GDP: 33 Trillion

GDP Per Capita PPP: 8,322

Food, Fiber, Fuel Harvested Acres: 2.06 Billion

Area Harvested Per Capita: .331

2023

World Population: 8.3 Billion

World GDP: 102 Trillion

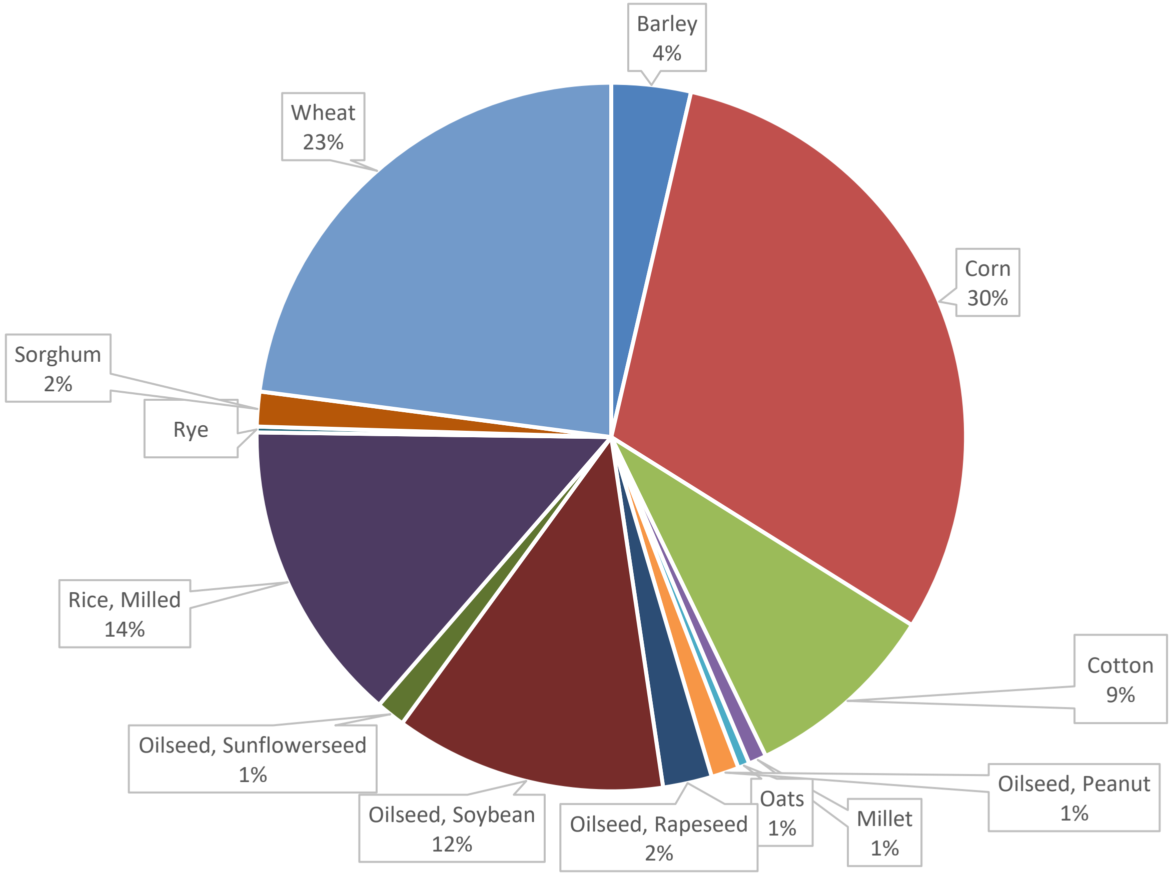
GDP Per Capita PPP: 20,693

Food, Fiber, Fuel Harvested Acres: 2.4 Billion

Area Harvested Per Capita: .301

Source: World Bank and Bloomberg

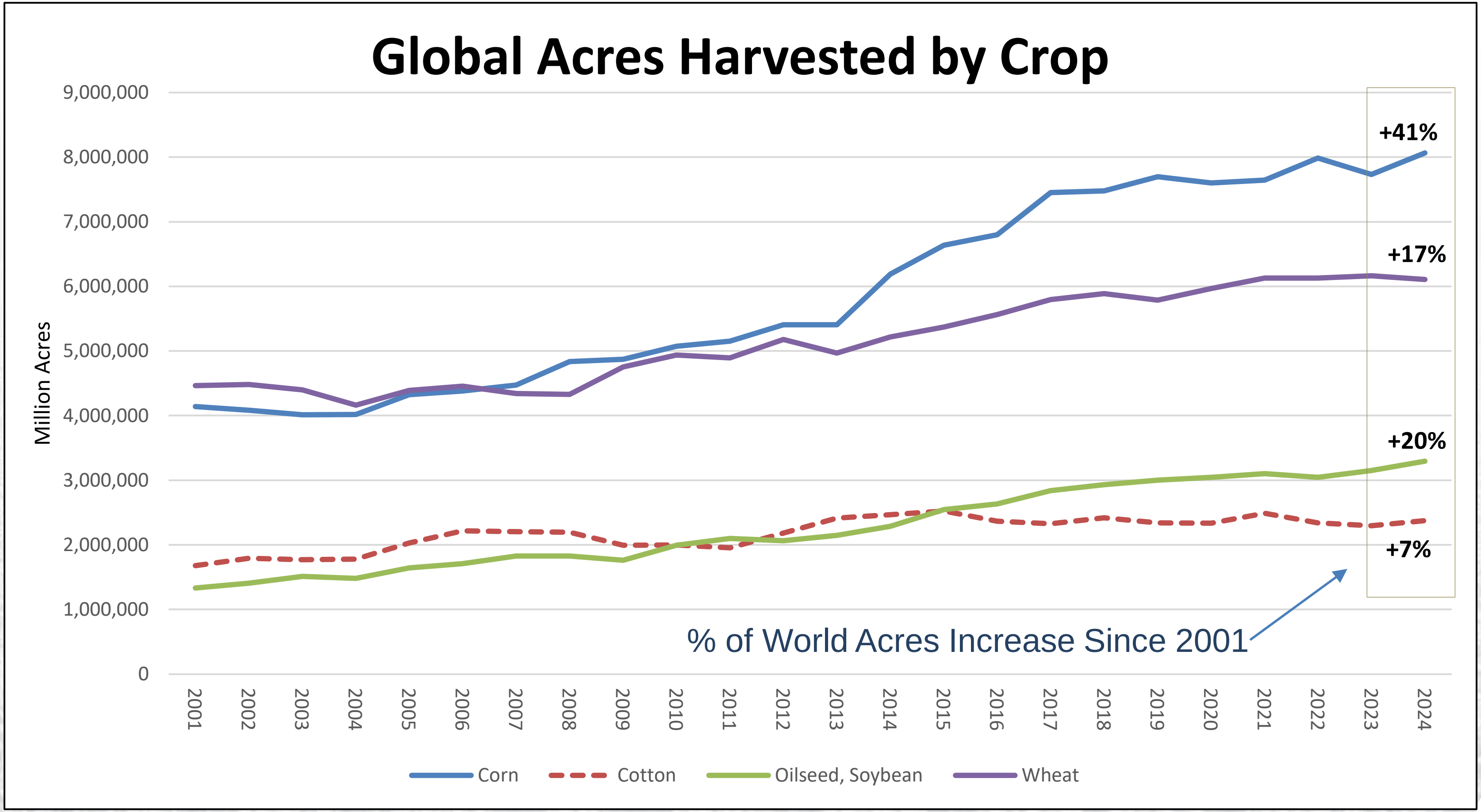
Global Harvested Acres by Crop 2023/2024



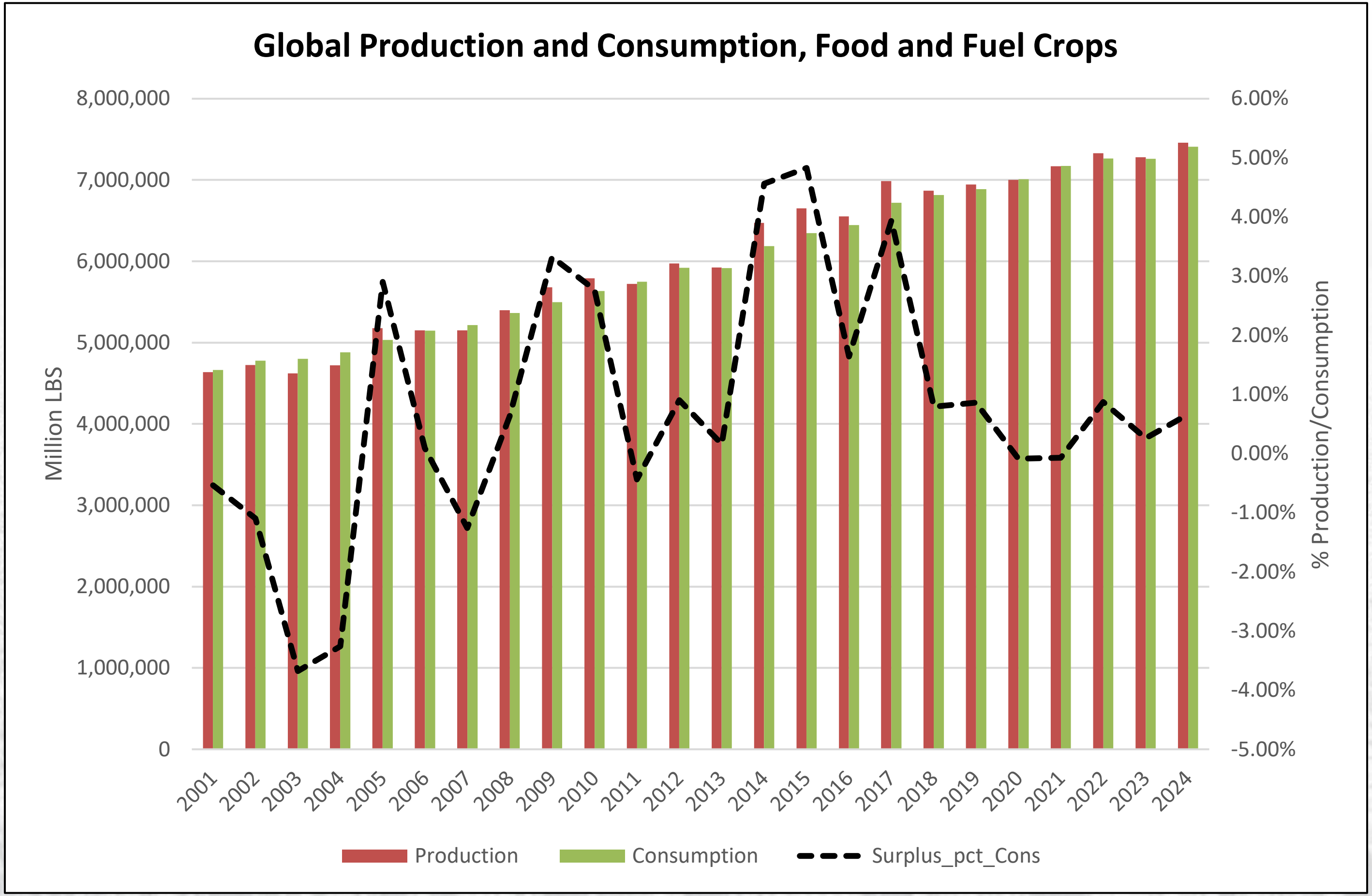
Food Crops Considered

Wheat
Corn
Soybeans
Rice
Peanuts
Barley
Sorghum
Rye
Sunflower
Rapeseed
Oats
Millet

Source: USDA Production, Supply and Demand

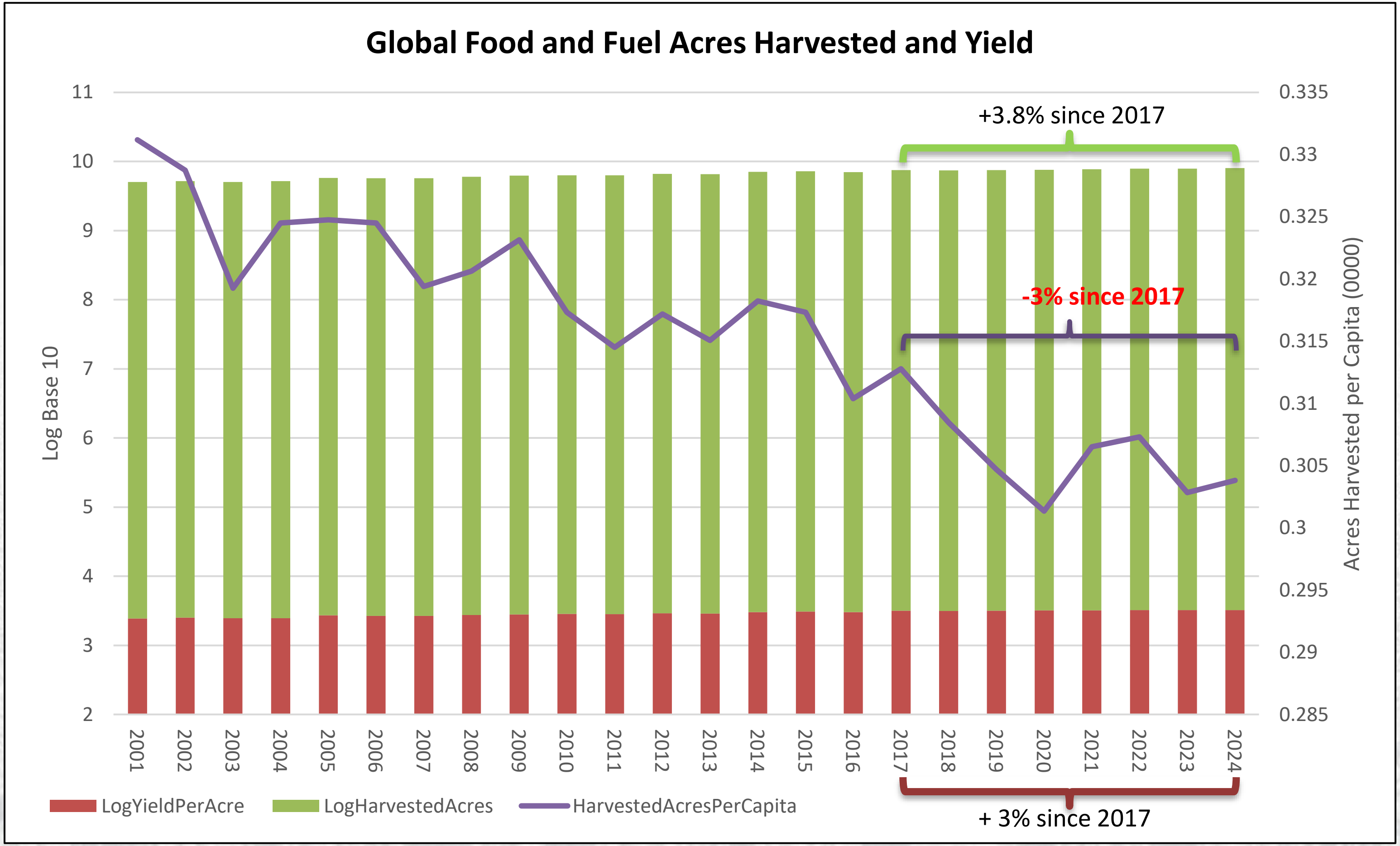


Source: USDA Production, Supply and Demand



- Prior to 2017 the Food Production surplus was more comfortable at an average of approx. 2%
- 2018 until present the surplus production has been closer to zero

Source: USDA Production, Supply and Demand



Source: USDA Production, Supply and Demand; World Bank population

THE STATE OF
FOOD SECURITY AND NUTRITION IN THE WORLD 2023

URBANIZATION, AGRIFOOD SYSTEMS TRANSFORMATION, AND HEALTHY DIETS ACROSS THE RURAL–URBAN CONTINUUM

Global hunger did not change from 2021 to 2022 but remains far above pre-pandemic levels

Between 691 and 783 million people faced hunger in 2022 – considering the midrange, about 122 million more people than in 2019, before the COVID-19 pandemic.

Last year stability in global hunger hides significant increases in some regions and subregions.

In 2022, hunger was still on the rise in Western Asia, the Caribbean and in all subregions of Africa, while declining in Latin America and Asia.

The pandemic caused a major setback in the fight to eradicate hunger. 2022 made it more difficult.

Almost 600 million people may still be facing hunger in 2030 – 119 million more than in a scenario in which the pandemic had not occurred. The events of 2022 alone will continue to have a longstanding impact, increasing by 23 million the number of undernourished people in 2030.

Nearly 2.4 billion people in the world lacked regular access to adequate food in 2022

30 percent of people in the world were moderately or severely food insecure – more women than men, and more people living in rural areas than in urban areas.

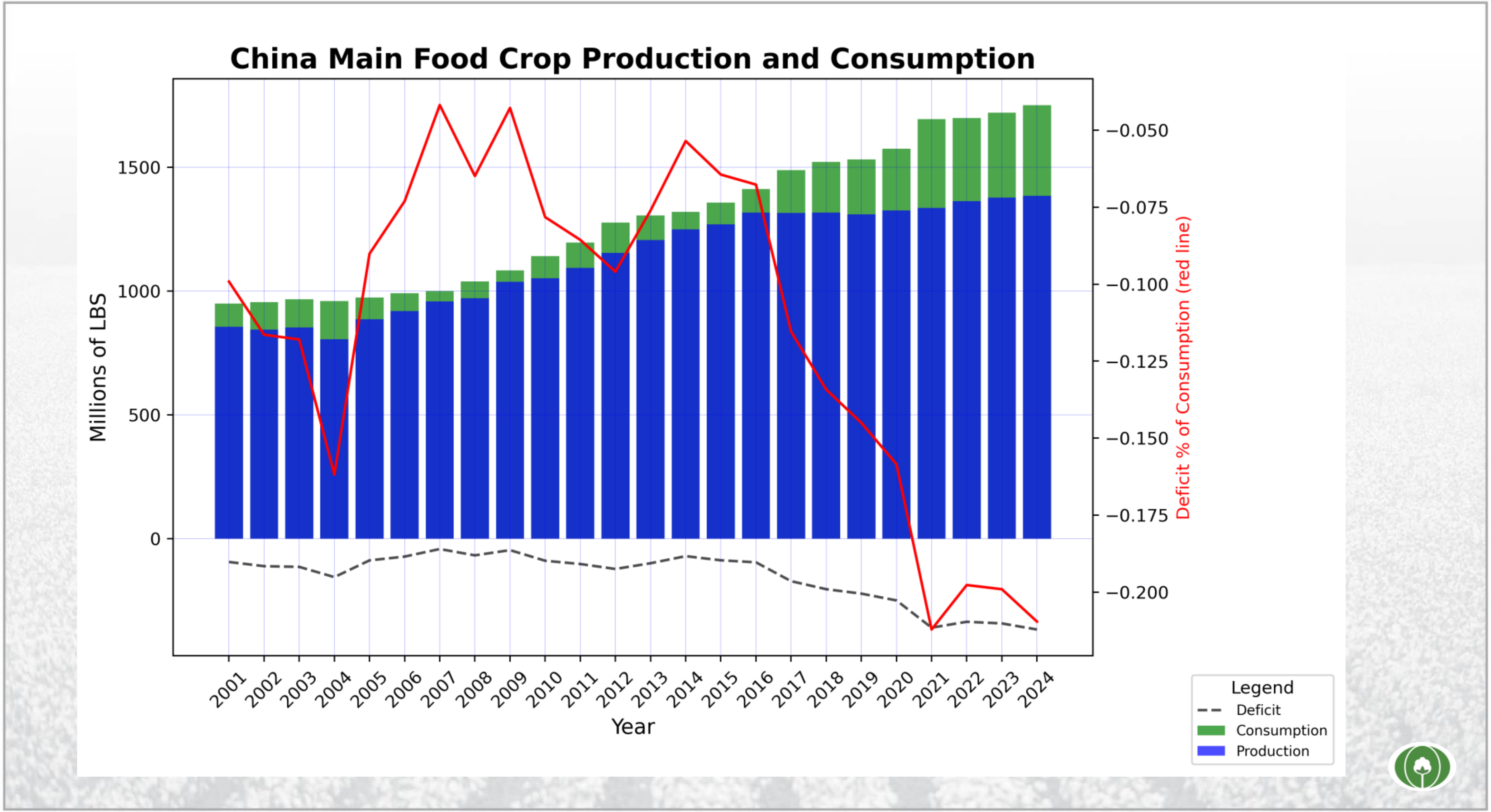
Healthy diets are out of reach for more than 3.1 billion people

78 percent of people in Africa were unable to afford a healthy diet in 2021, compared to 44 percent in Asia, 23 percent in Latin America and the Caribbean, and 3 percent in Oceania.

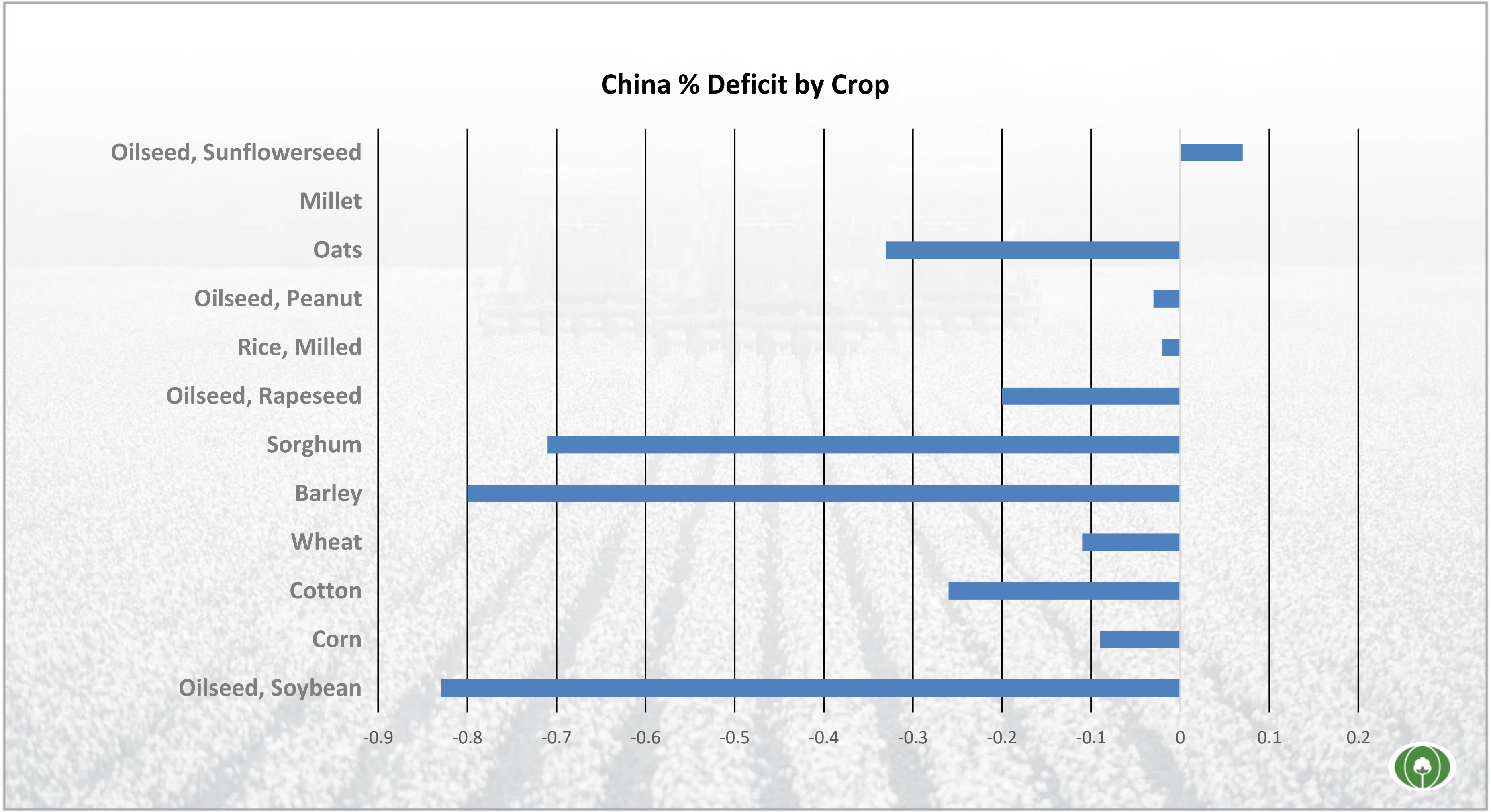
The world is not on track to achieve global nutrition targets

Stunting in children under five years and exclusive breastfeeding have improved and some progress has been made on wasting, while low birthweight and overweight in children under five have not changed.

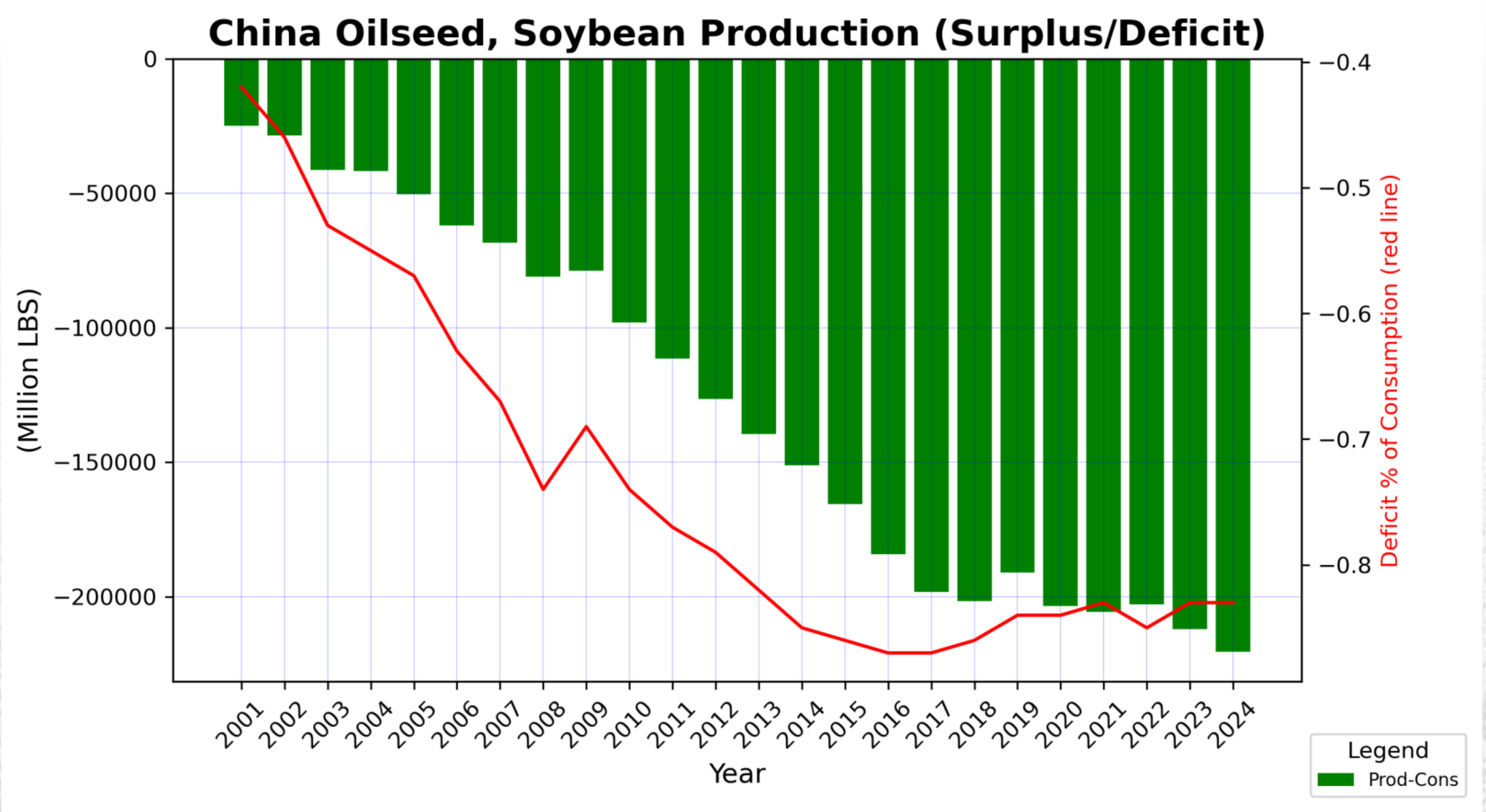
Source: United Nations FAO



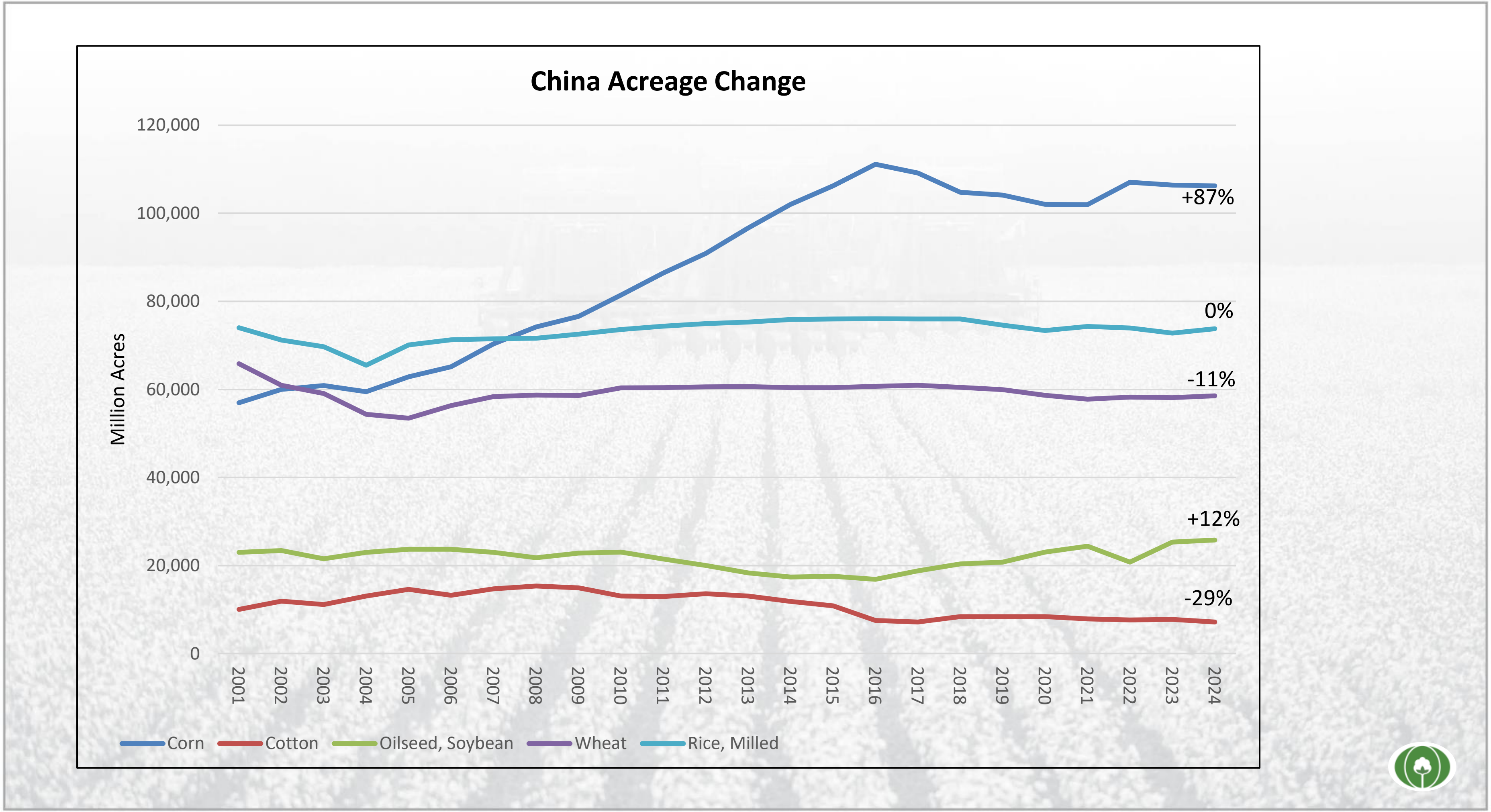
Source: USDA Production, Supply and Demand



Source: USDA Production, Supply and Demand



Source: USDA Production, Supply and Demand



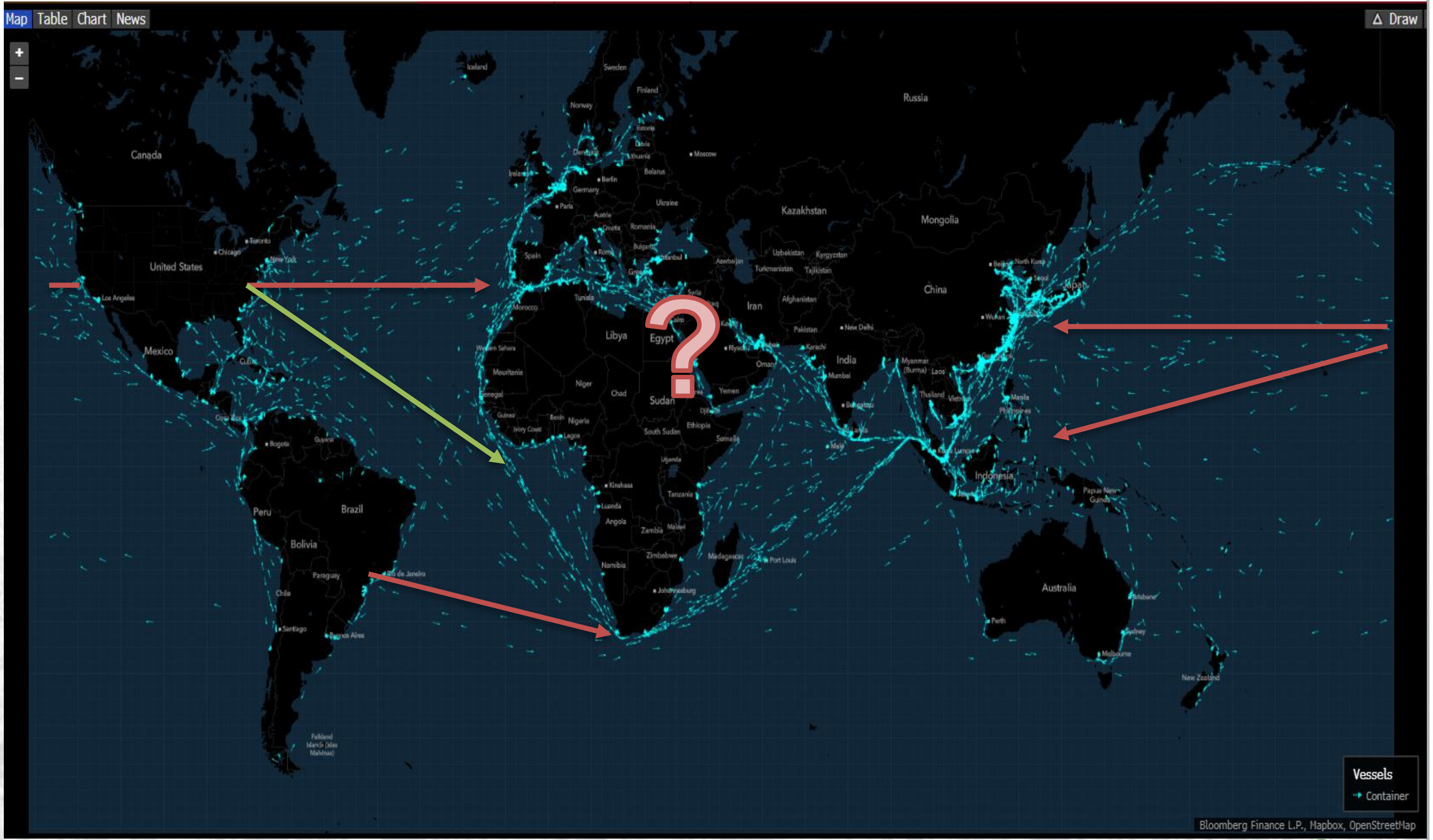
Source: USDA Production, Supply and Demand

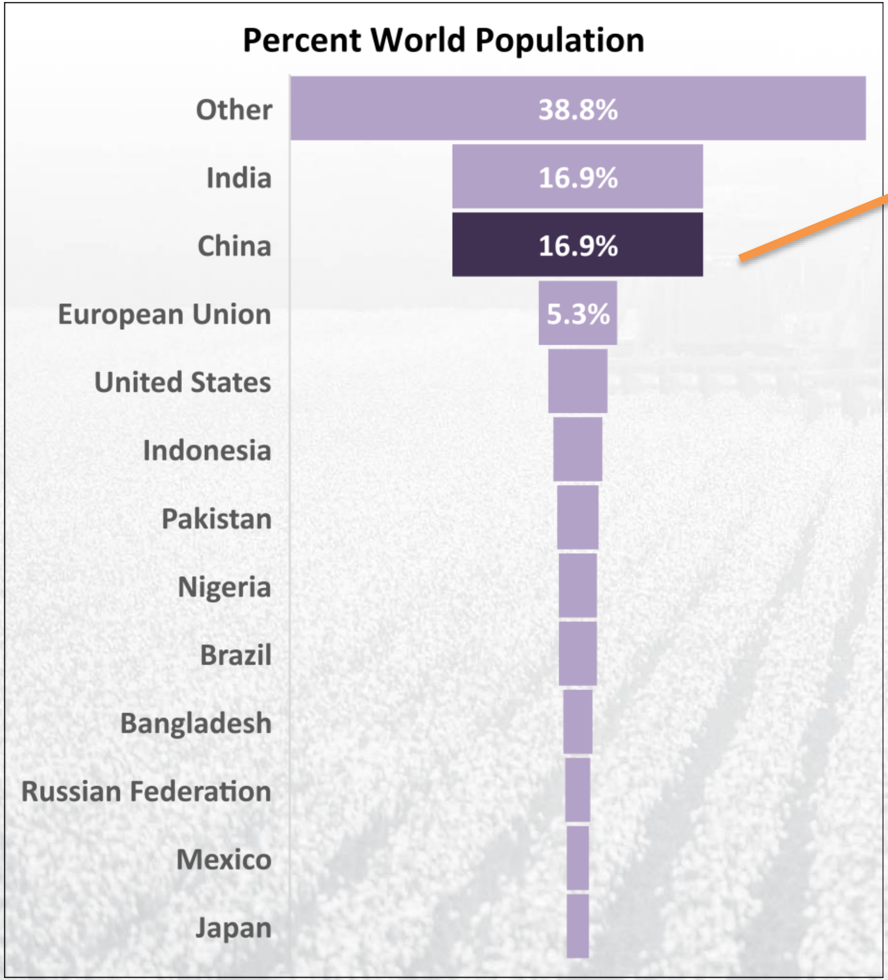
Surplus and Deficit Countries for Food and Fuel

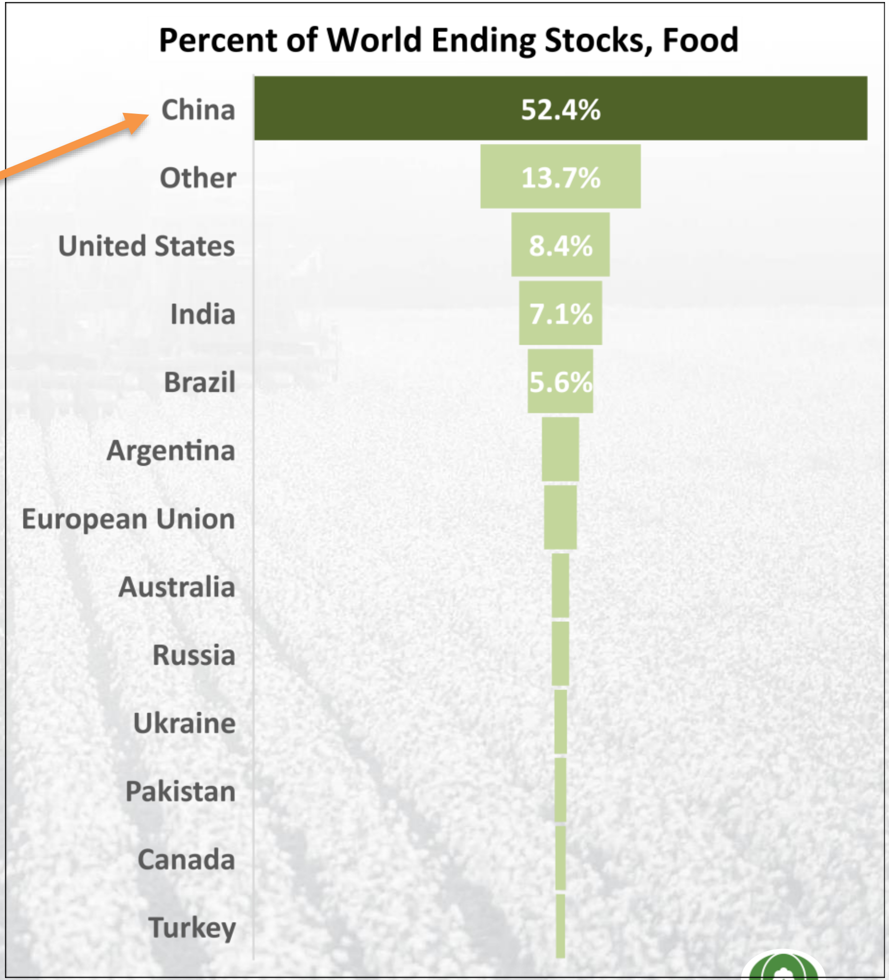
Top 10 by Volume

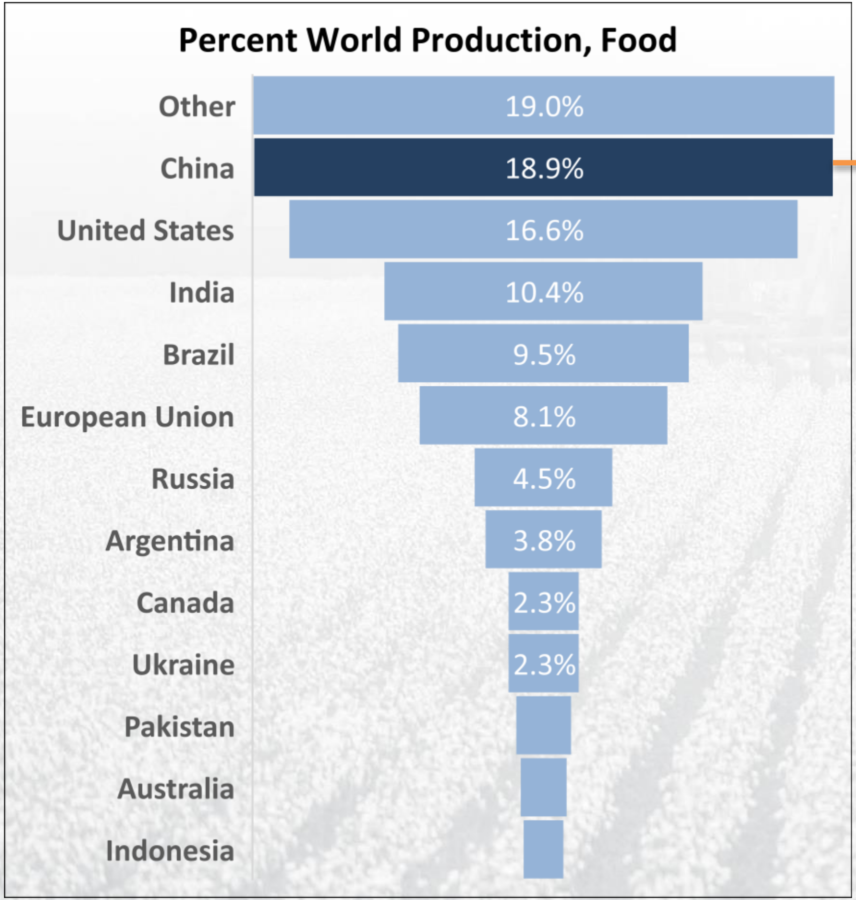
	Deficit	
1	China	-367,011
2	Mexico	-77,097
3	Japan	-62,798
4	Egypt	-51,588
5	Iran	-40,761
6	Korea, South	-38,664
7	Indonesia	-35,450
8	Algeria	-35,007
9	Saudi Arabia	-32,932
10	European Union	-27,840

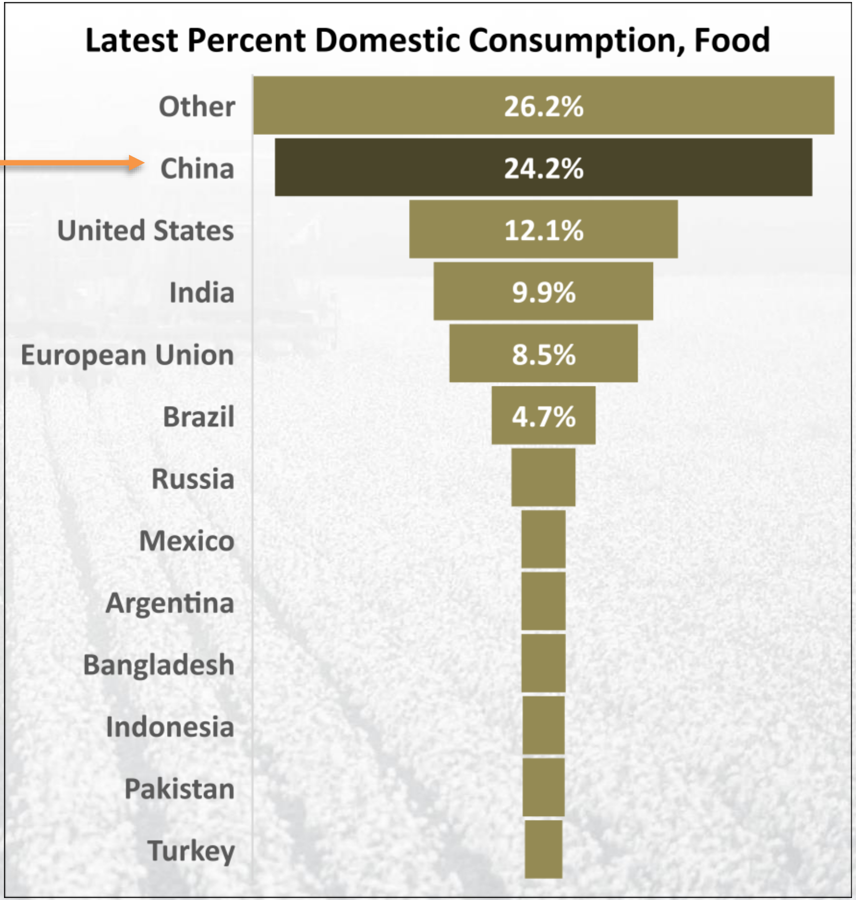
	Surplus	
1	Brazil	329362
2	United States	313785
3	Argentina	135993
4	Russia	129255
5	Ukraine	105452
6	Canada	81351
7	Australia	61098
8	India	42577
9	Paraguay	23822
10	Kazakhstan	14625



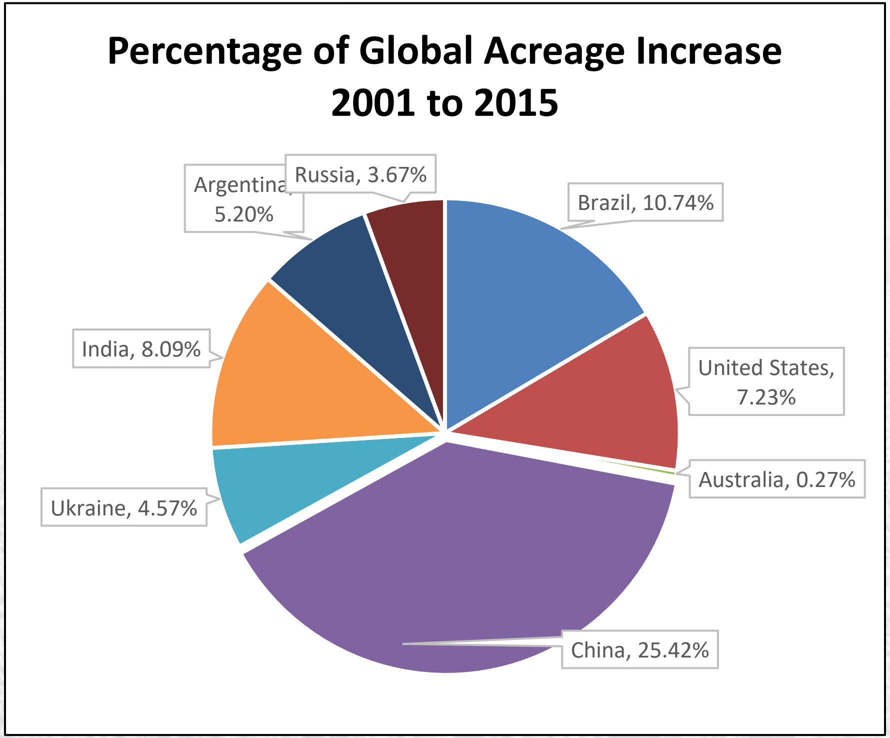

Percent World Population
Other
38.8%
India
16.9%
China
16.9%
European Union
5.3%
United States
Indonesia
Pakistan
Nigeria
Brazil
Bangladesh
Russian Federation
Mexico
Japan

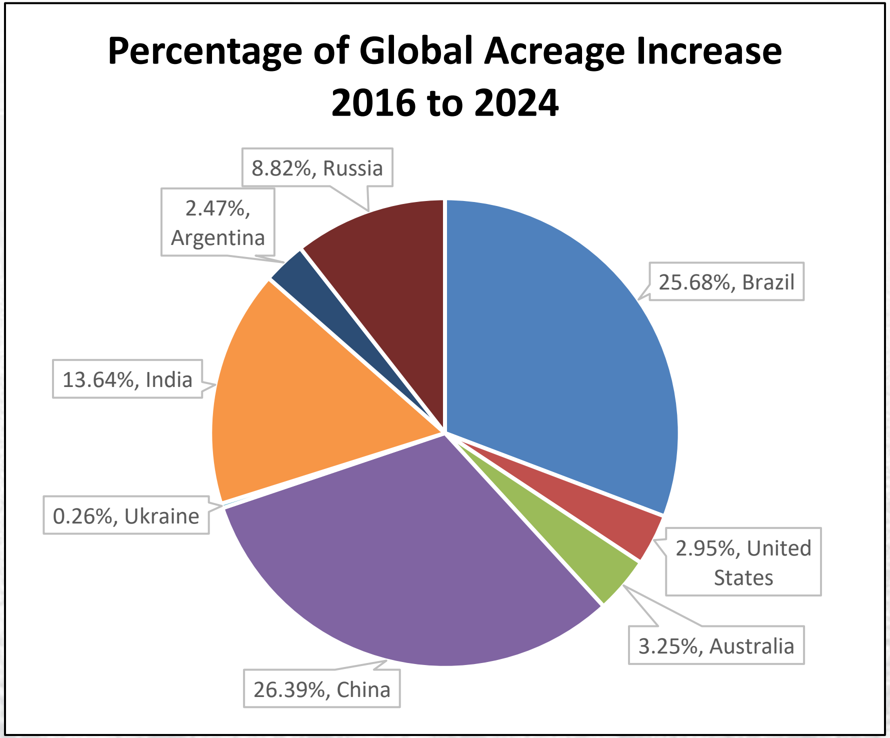

Percent of World Ending Stocks, Food
China
52.4%
Other
13.7%
United States
8.4%
India
7.1%
Brazil
5.6%
Argentina
European Union
Australia
Russia
Ukraine
Pakistan
Canada
Turkey

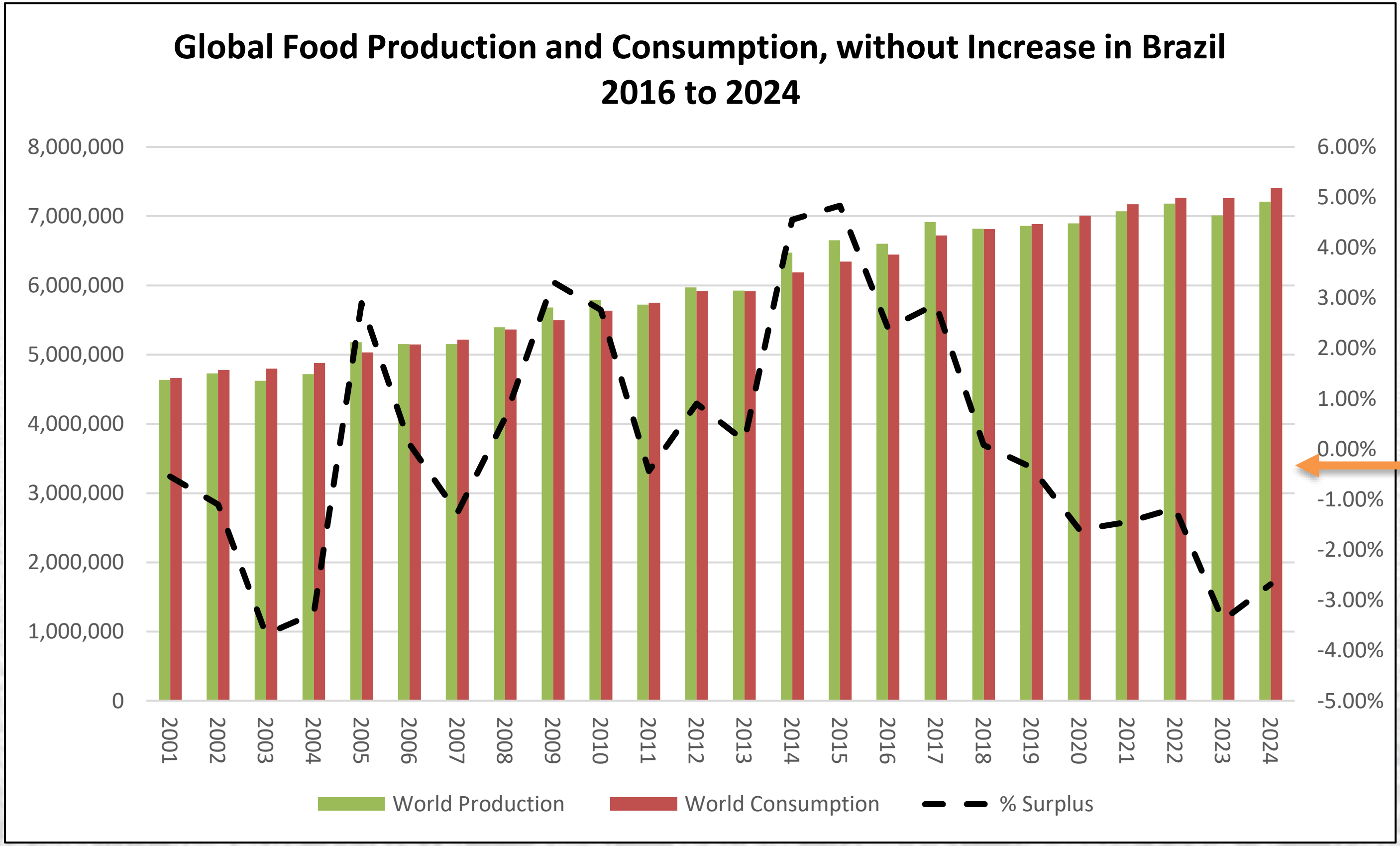

Percent World Production, Food
Other
China
United States
India
Brazil
European Union
Russia
Argentina
Canada
Ukraine
Pakistan
Australia
Indonesia
19.0%
18.9%
16.6%
10.4%
9.5%
8.1%
4.5%
3.8%
2.3%
2.3%


Latest Percent Domestic Consumption, Food
Other
China
United States
India
European Union
Brazil
Russia
Mexico
Argentina
Bangladesh
Indonesia
Pakistan
Turkey
26.2%
24.2%
12.1%
9.9%
8.5%
4.7%

Global Acres Change by Crop

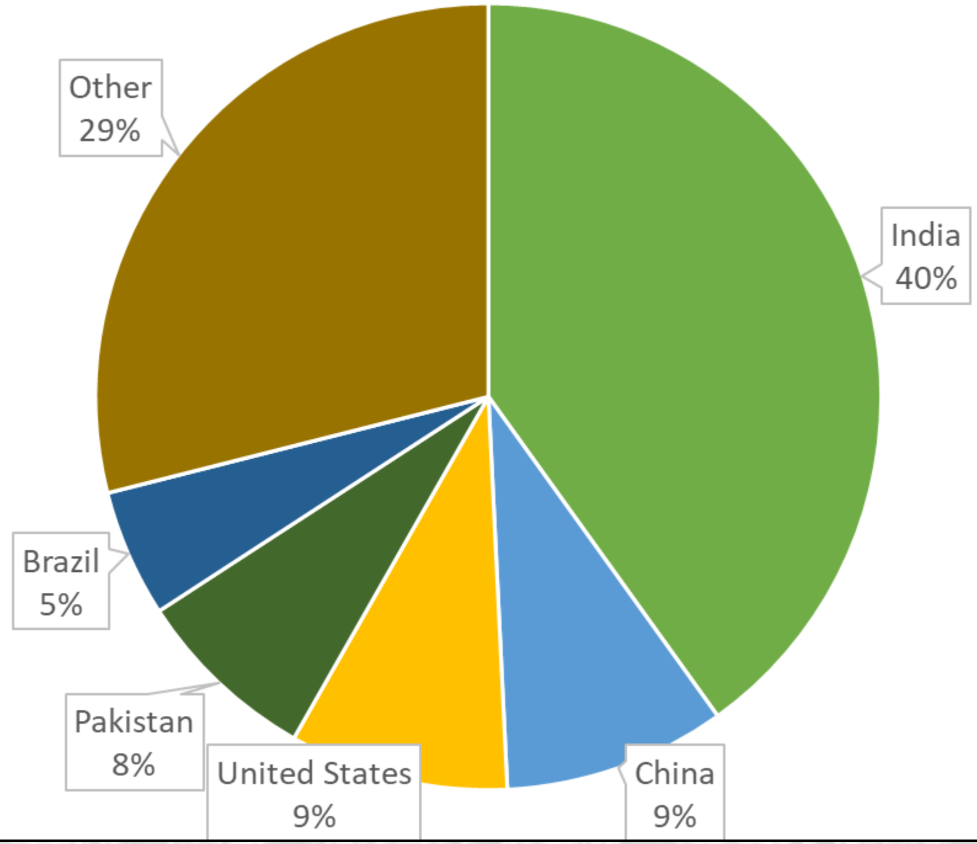


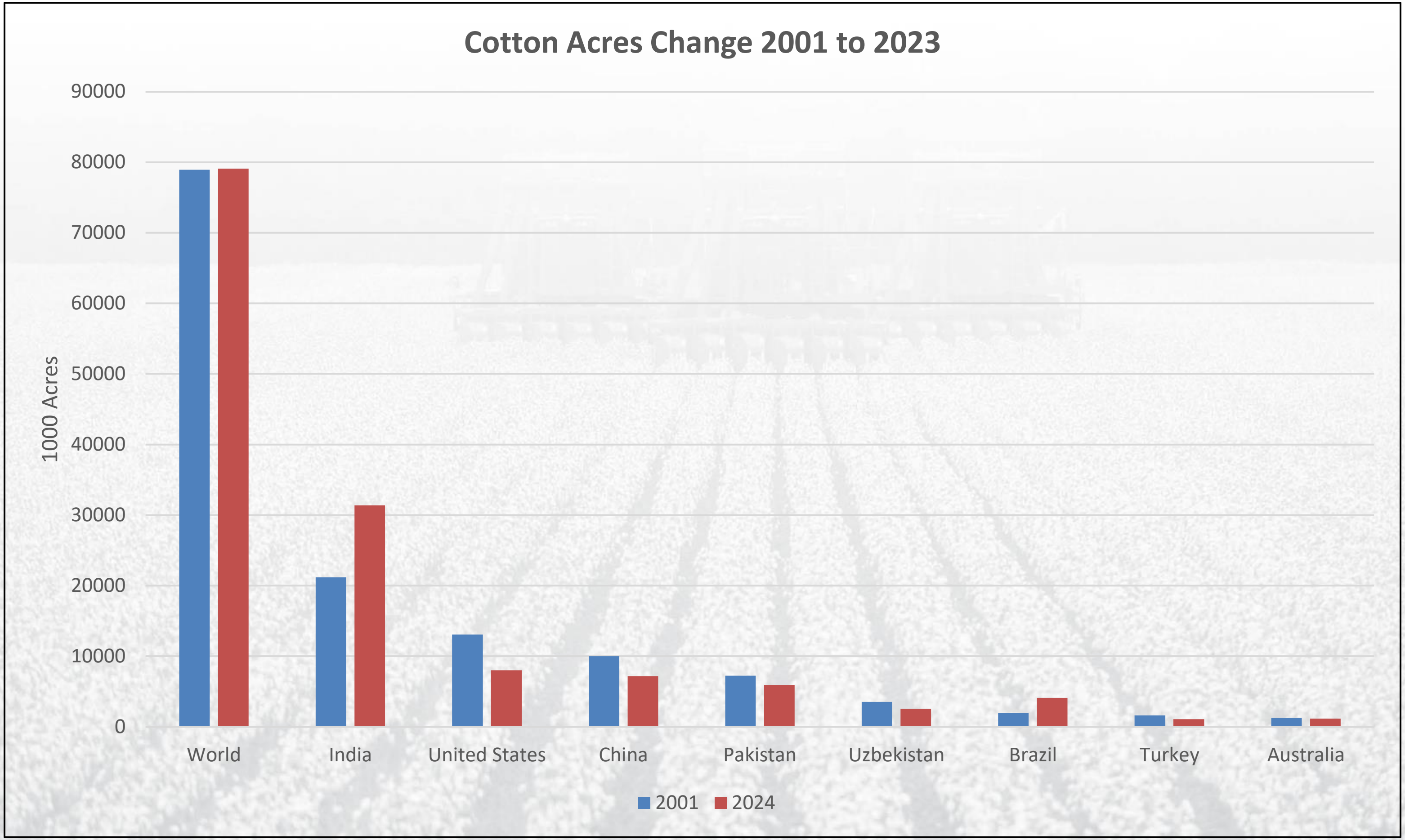




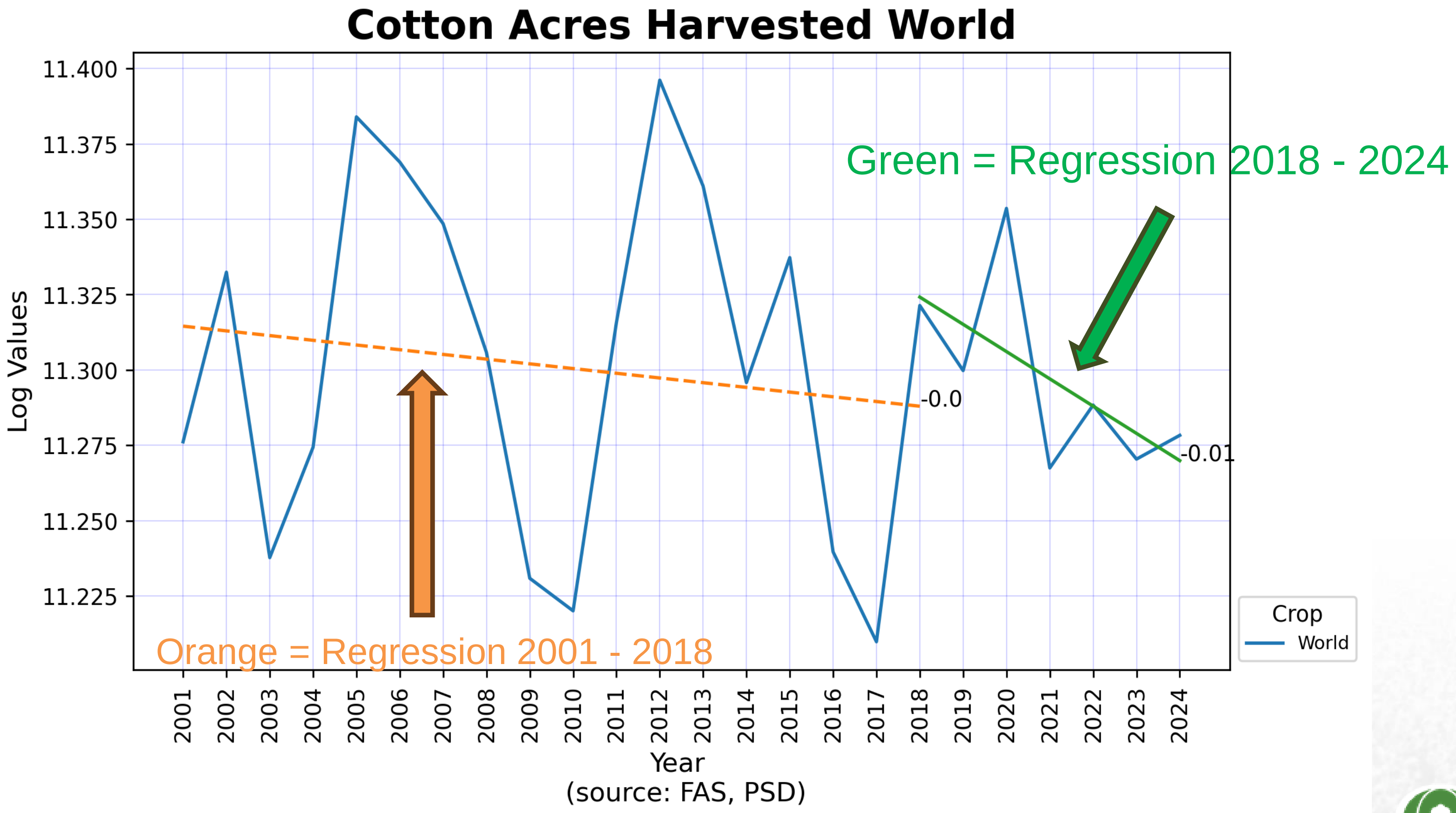
Current Level of Surplus

Percentage of World Cotton Acreage By Country

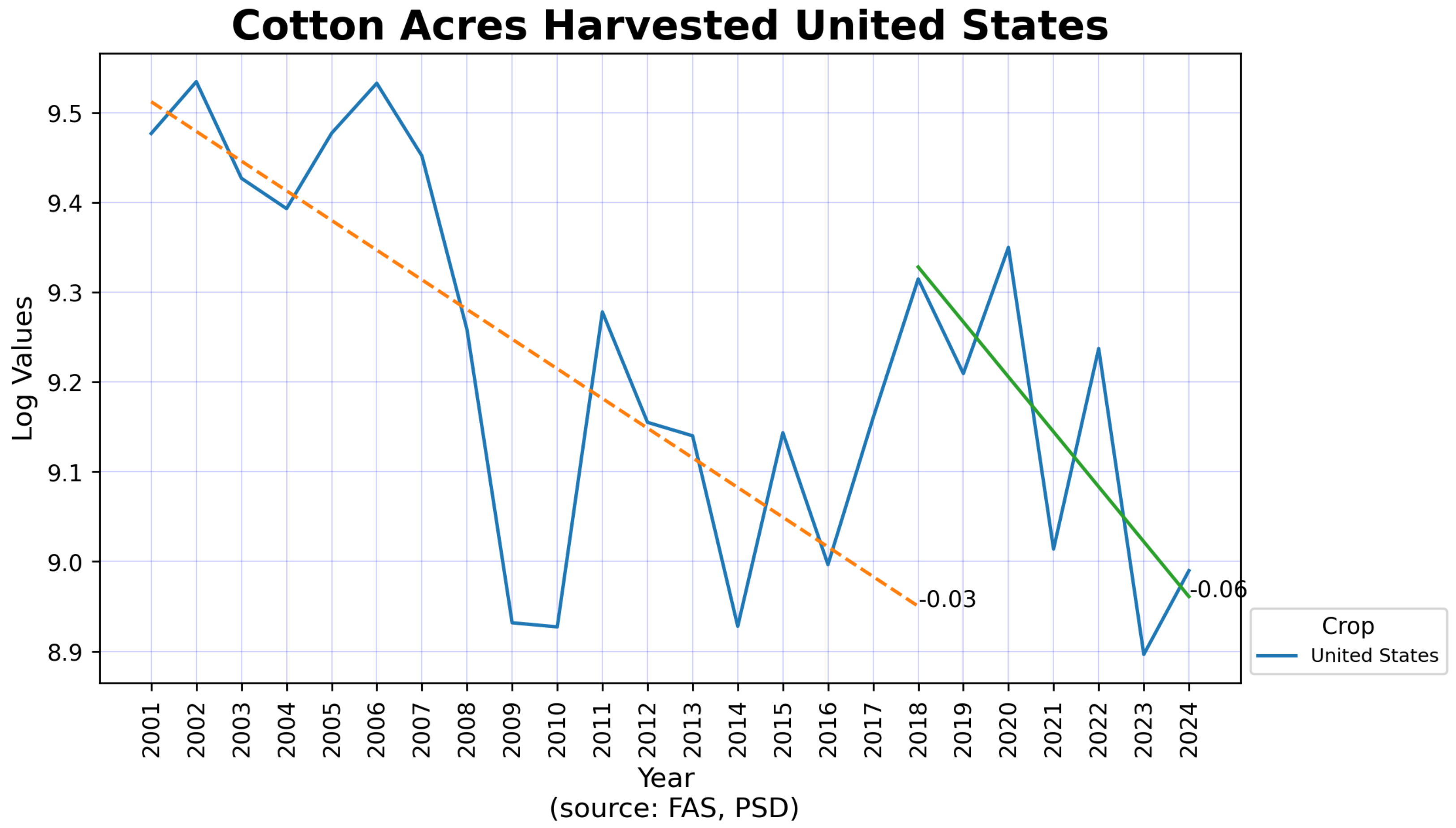




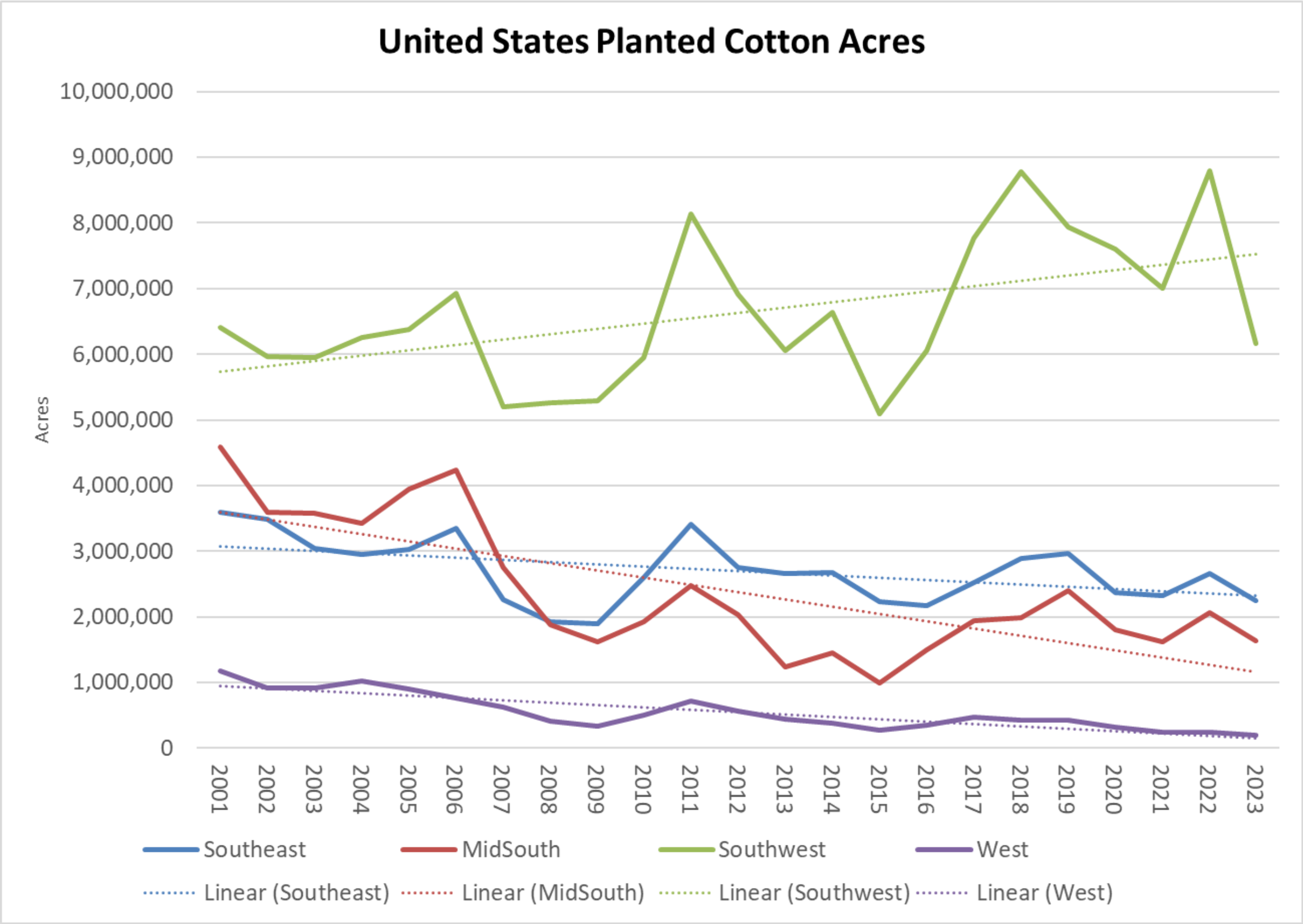
Cotton Acres Change 2001 to 2023
1000 Acres
90000
80000
70000
60000
50000
40000
30000
20000
10000
0
World
India
United States
China
Pakistan
Uzbekistan
Brazil
Turkey
Australia
2001
2024



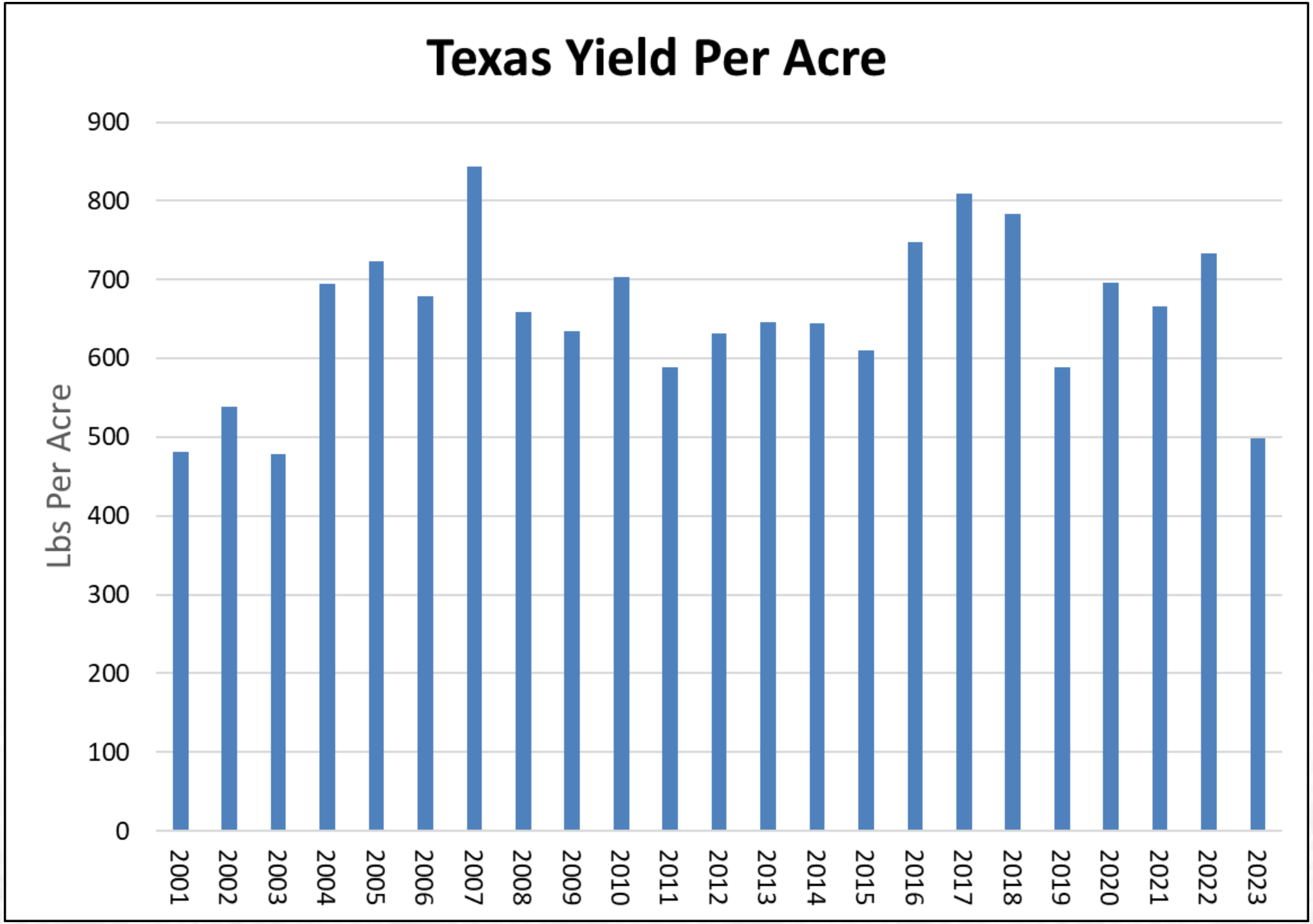
Cotton Acres Harvested World
Green = Regression 2018 - 2024
Orange = Regression 2001 - 2018
Log Values
11.400
11.375
11.350
11.325
11.300
11.275
11.250
11.225
-0.0
-0.01
Crop
World
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
Year
(source: FAS, PSD)



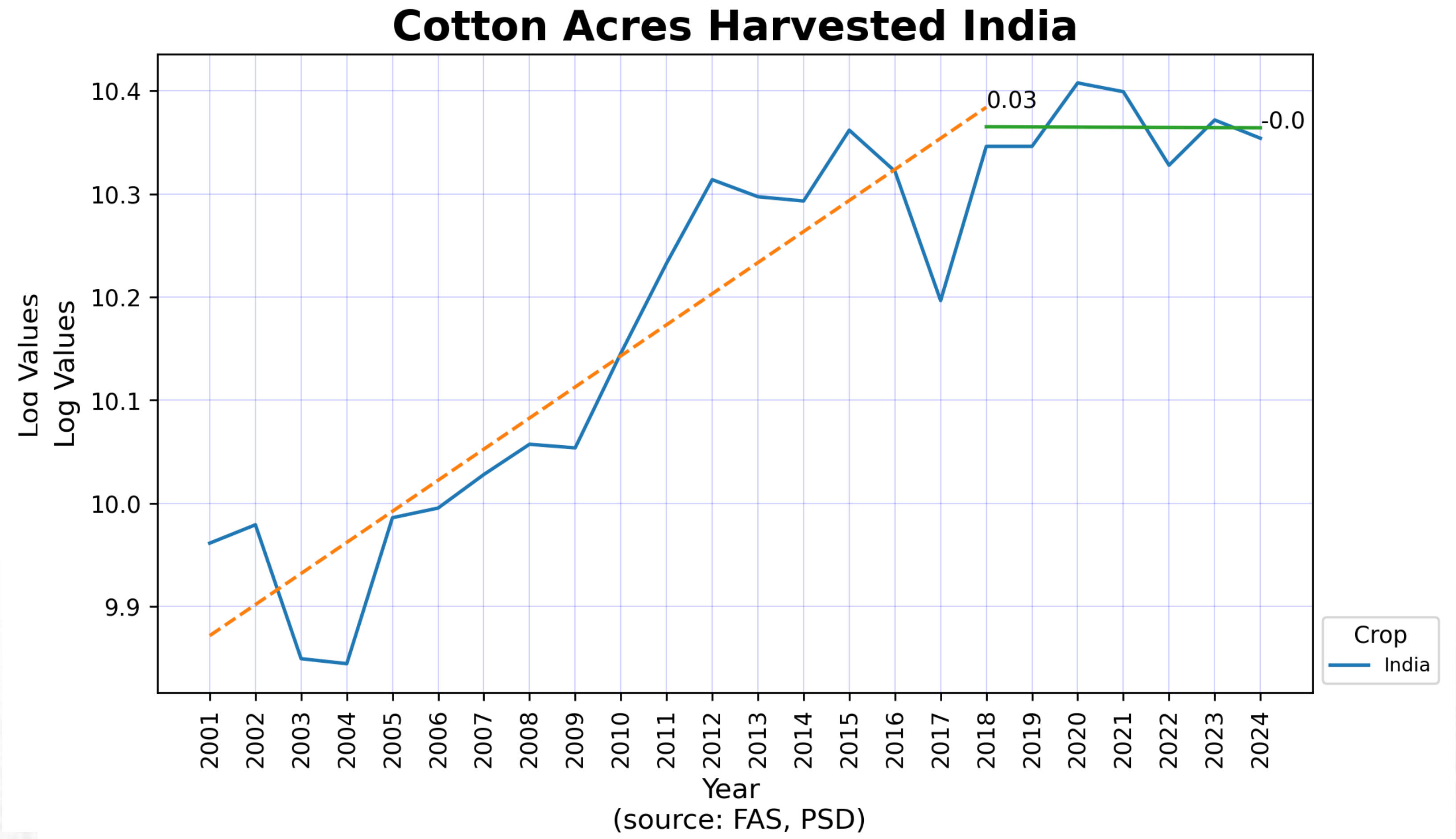
Cotton Acres Harvested United States
Log Values
9.5
9.4
9.3
9.2
9.1
9.0
8.9
-0.03
-0.06
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
Year
(source: FAS, PSD)
Crop
United States



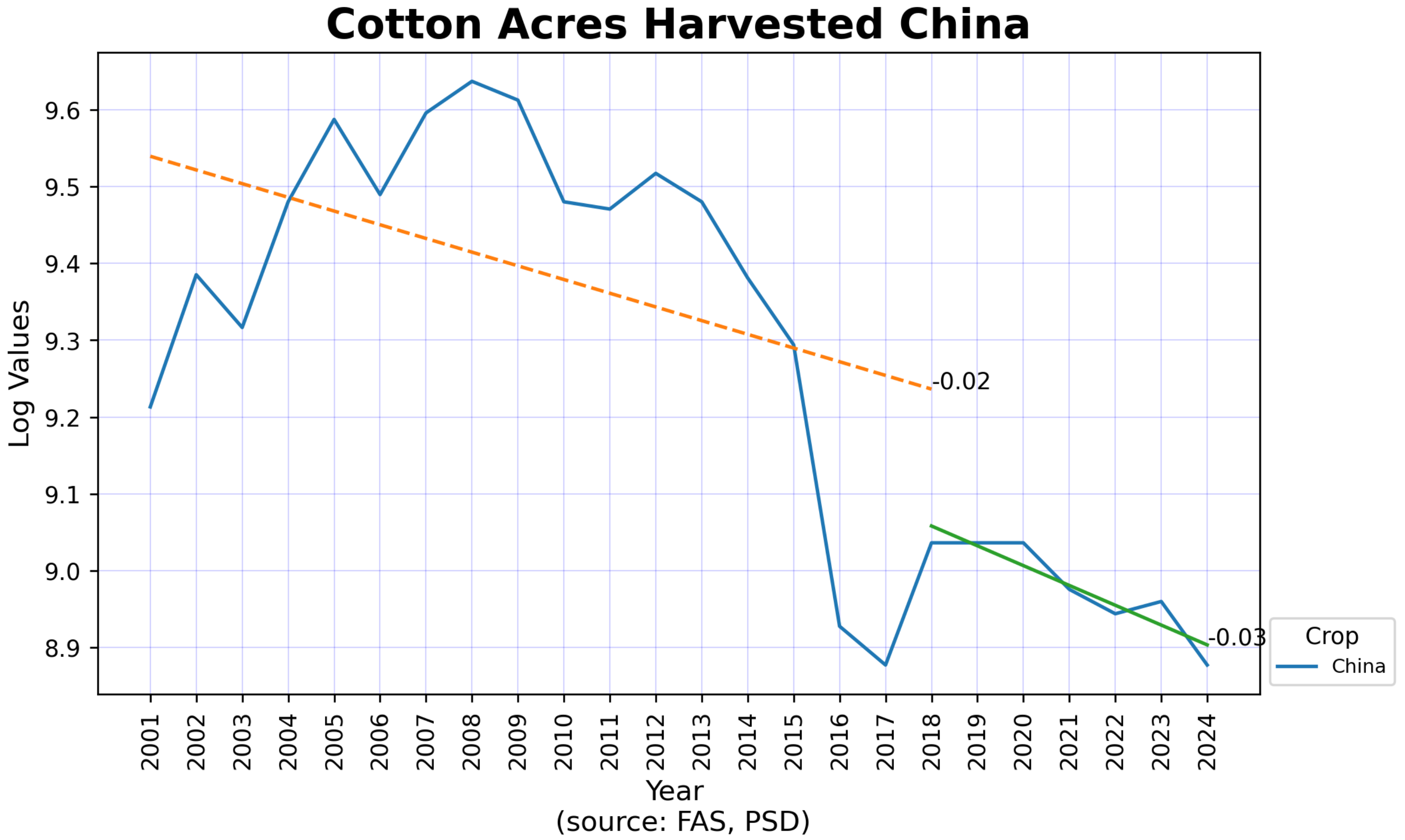
United States Planted Cotton Acres
Acres
10,000,000
9,000,000
8,000,000
7,000,000
6,000,000
5,000,000
4,000,000
3,000,000
2,000,000
1,000,000
0
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
Southeast
MidSouth
Southwest
West
Linear (Southeast)
Linear (MidSouth)
Linear (Southwest)
Linear (West)



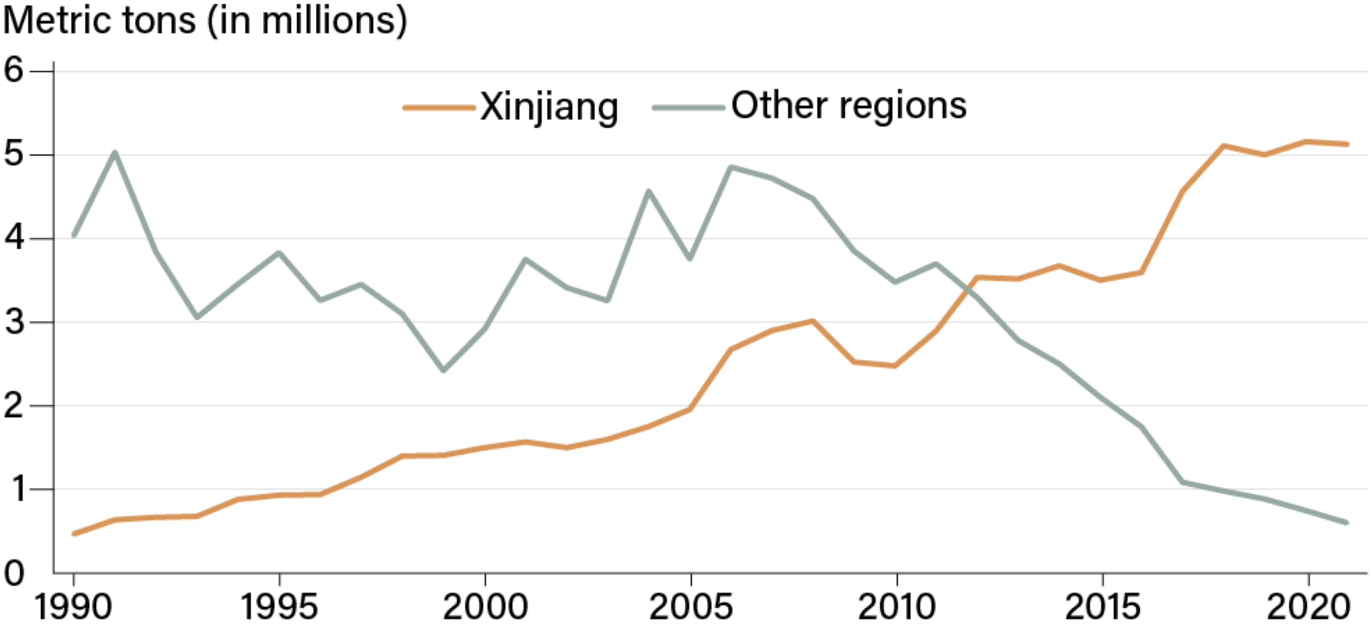
Texas Yield Per Acre
900
800
700
600
500
400
300
200
100
0
Lbs Per Acre
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023



Cotton Acres Harvested India
Log Values
Log Values
10.4
10.3
10.2
10.1
10.0
9.9
0.03
-0.0
Crop
India
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
Year
(source: FAS, PSD)

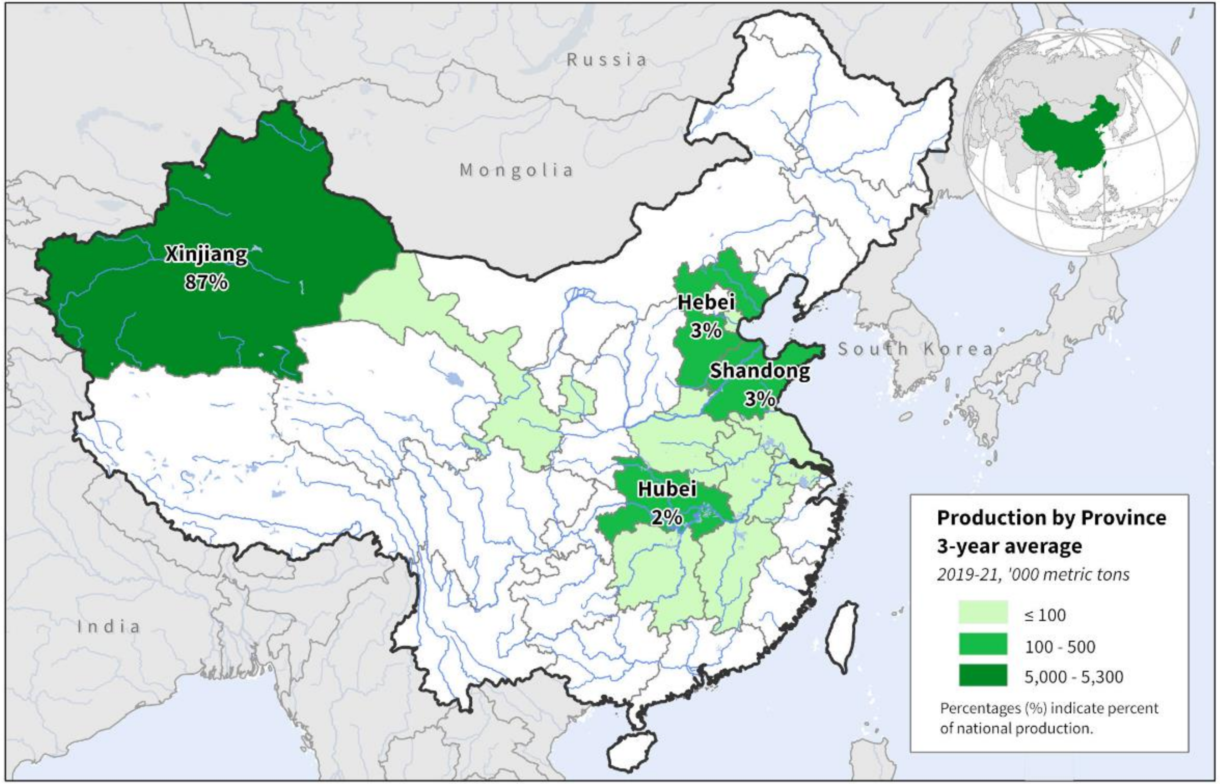

Cotton Acres Harvested China
Log Values
9.6
9.5
9.4
9.3
9.2
9.1
9.0
8.9
-0.02
-0.03
Crop
China
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
Year
(source: FAS, PSD)

China's cotton output increased in Xinjiang and decreased in other regions from 1990–2021



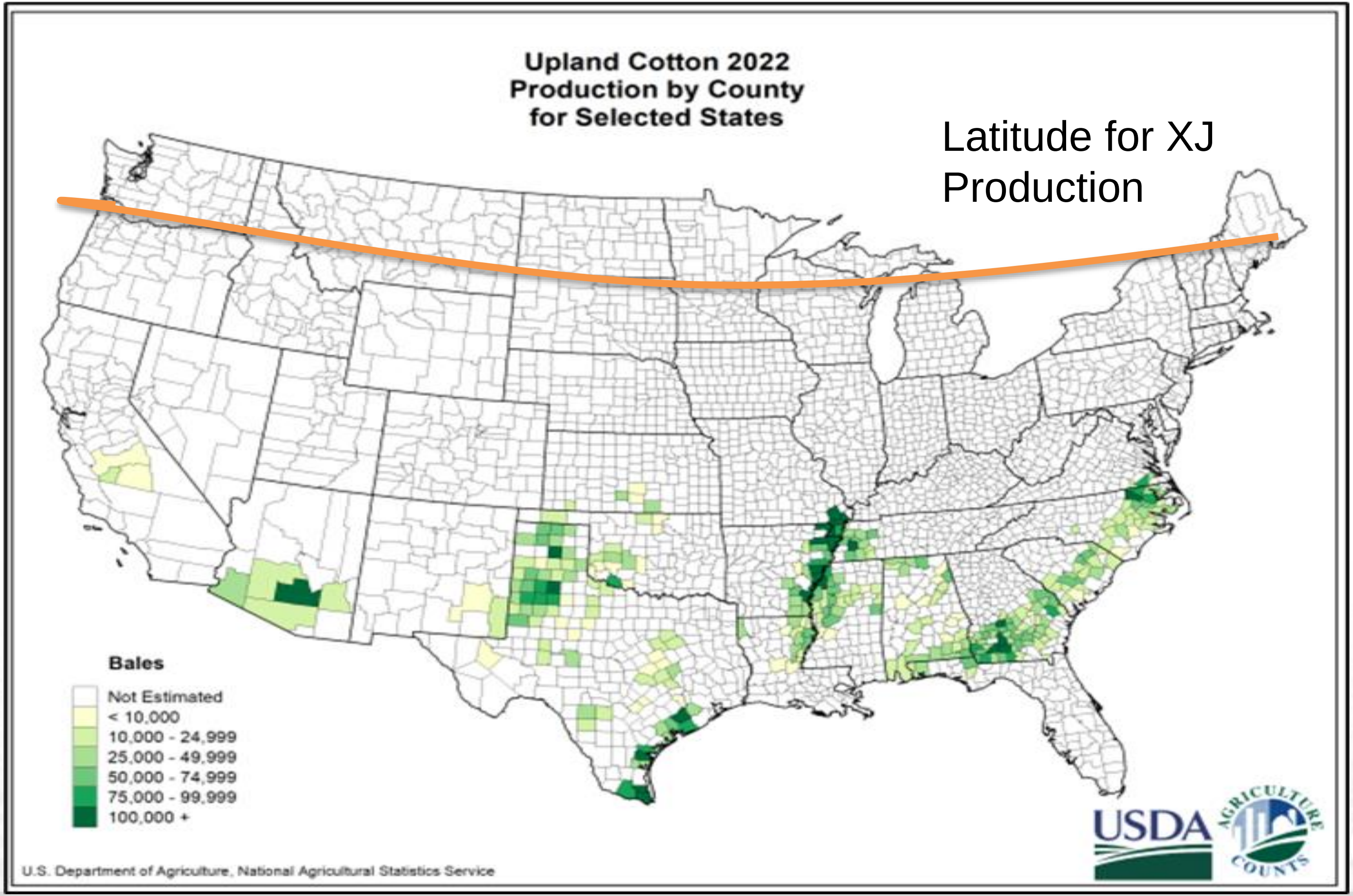
Source: USDA, Economic Research Service using data from the National Bureau of Statistics of China.

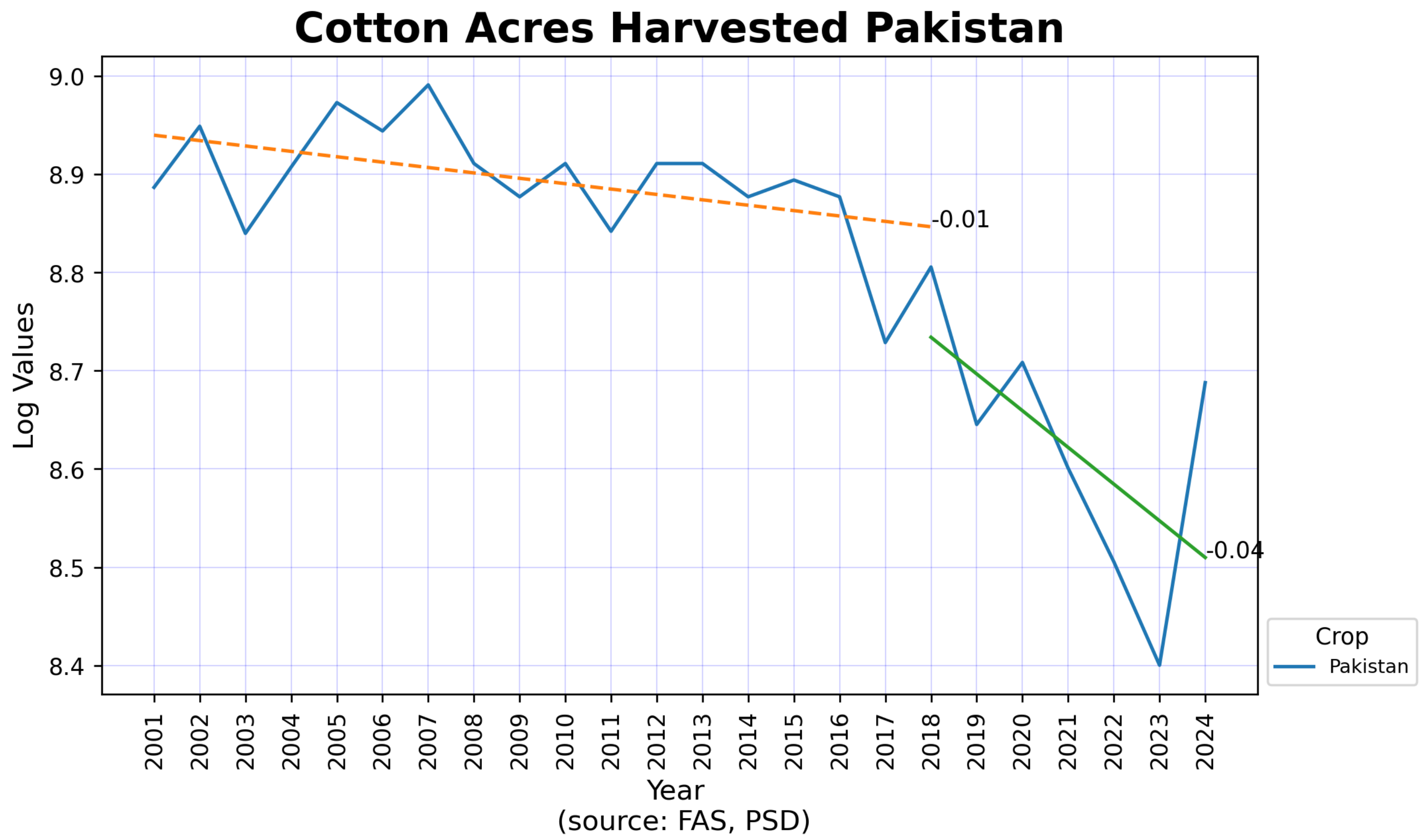
China: Cotton Production



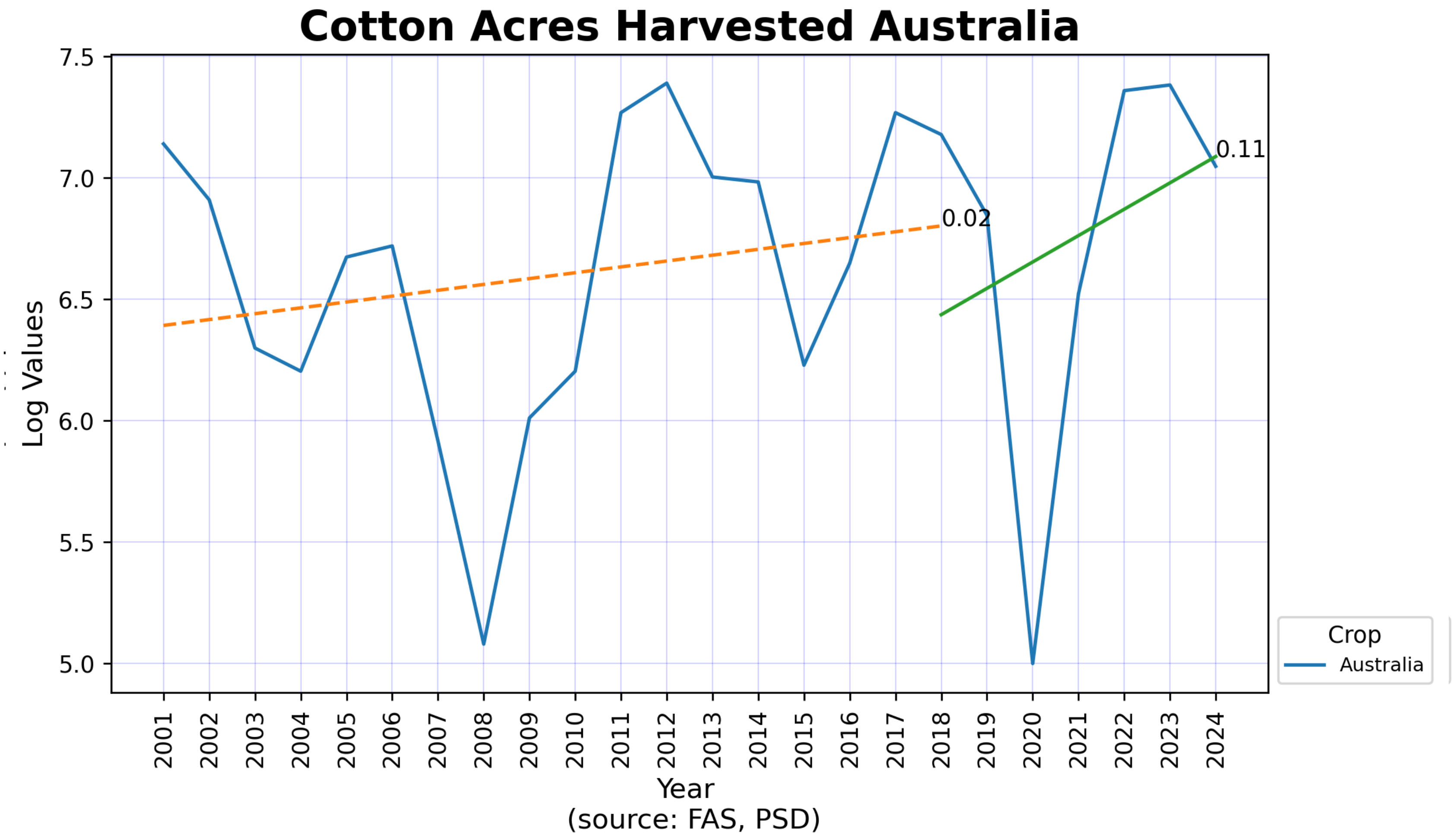
USDA Foreign Agricultural Service
U.S. DEPARTMENT OF AGRICULTURE

Source: National Bureau of Statistics of China (data excluding Taiwan)
Average Cotton Production 2019-2021

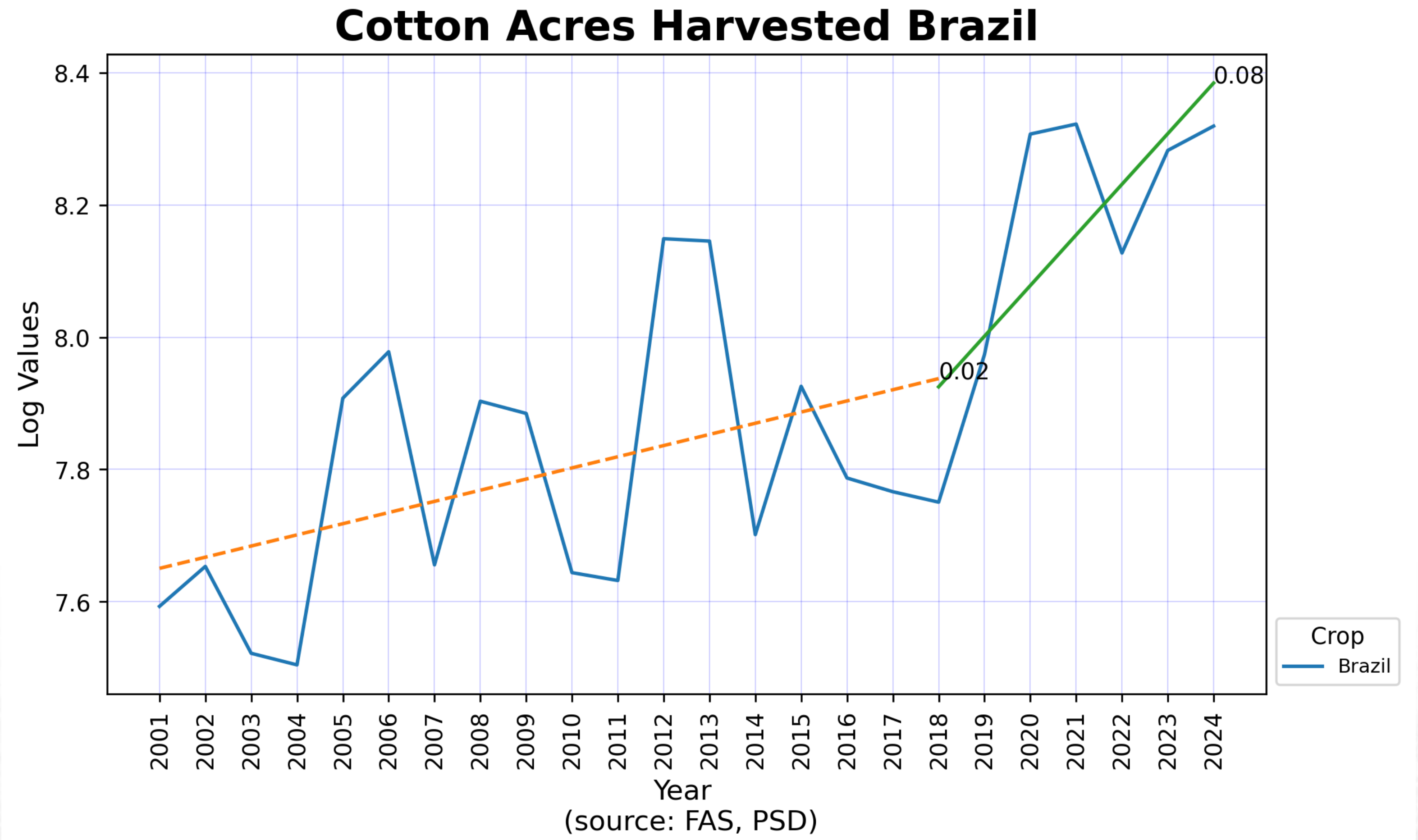

Upland Cotton 2022
Production by County
for Selected States
Latitude for XJ
Production
Bales
Not Estimated
< 10,000
10,000 - 24,999
25,000 - 49,999
50,000 - 74,999
75,000 - 99,999
100,000 +
U.S. Department of Agriculture, National Agricultural Statistics Service
USDA
AGRICULTURE COUNTS

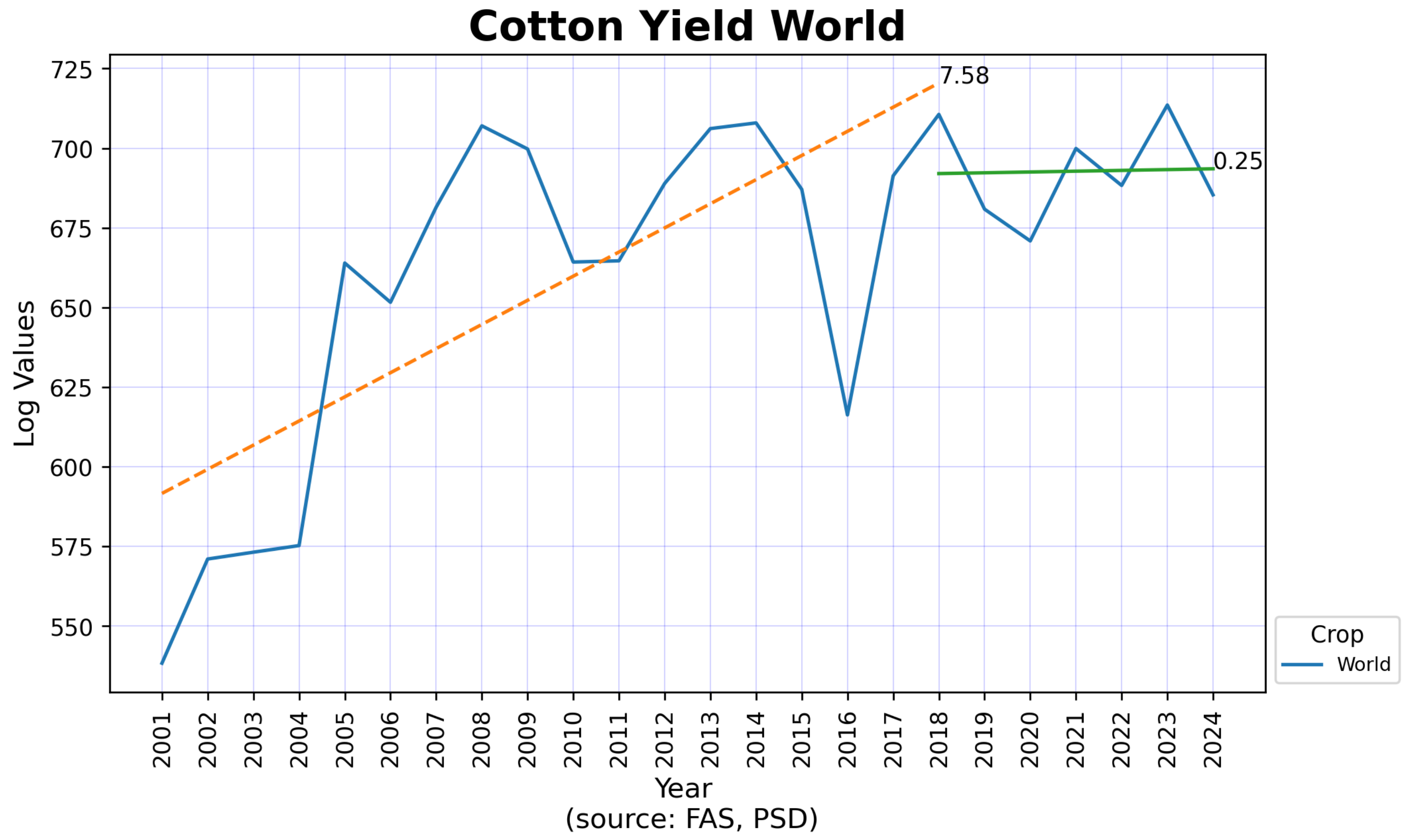


Cotton Acres Harvested Pakistan
Log Values
9.0
8.9
8.8
8.7
8.6
8.5
8.4
-0.01
-0.04
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
Year
(source: FAS, PSD)
Crop
Pakistan

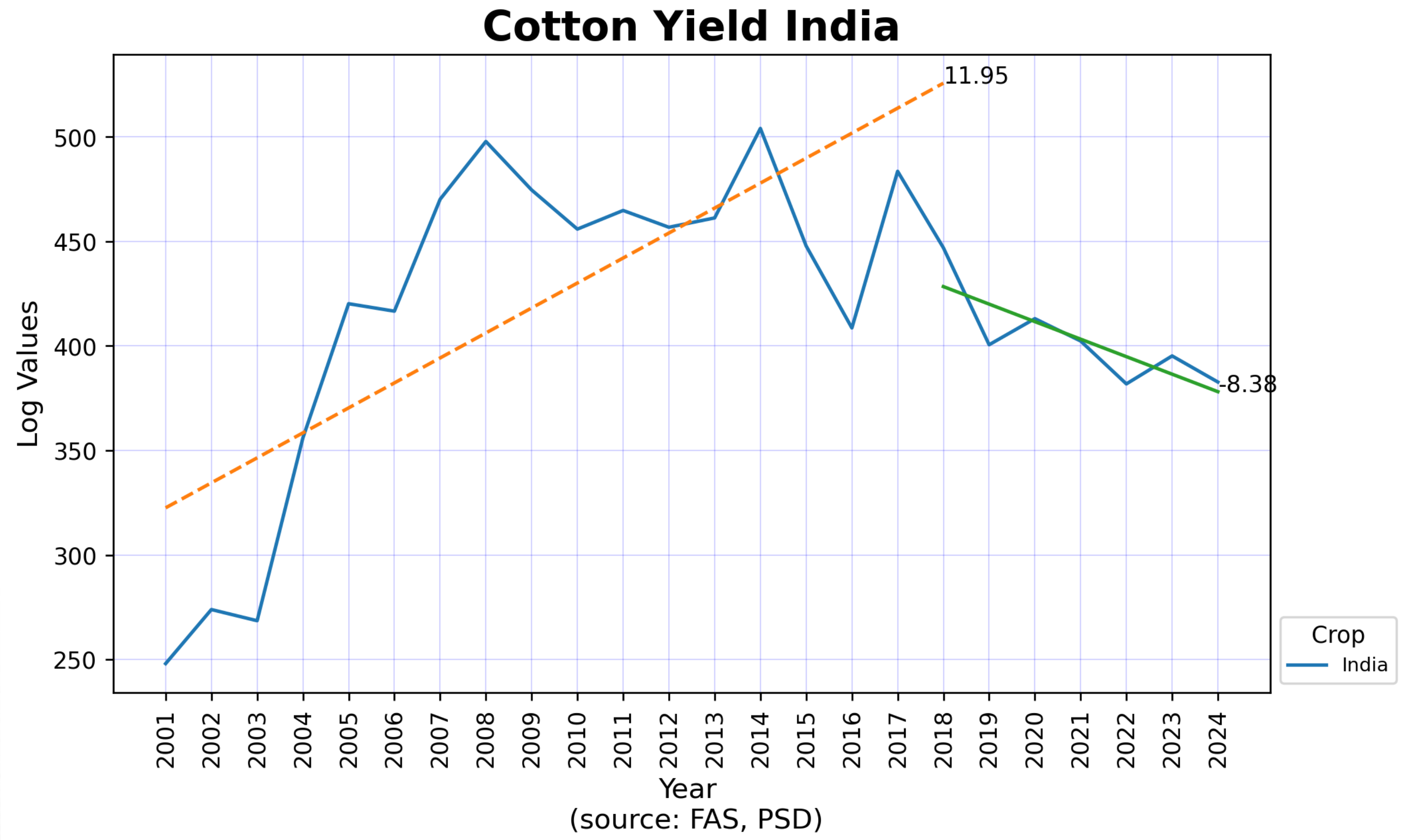


Cotton Acres Harvested Australia
7.5
7.0
6.5
6.0
5.5
5.0
Log Values
0.02
0.11
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
Year
(source: FAS, PSD)
Crop
Australia

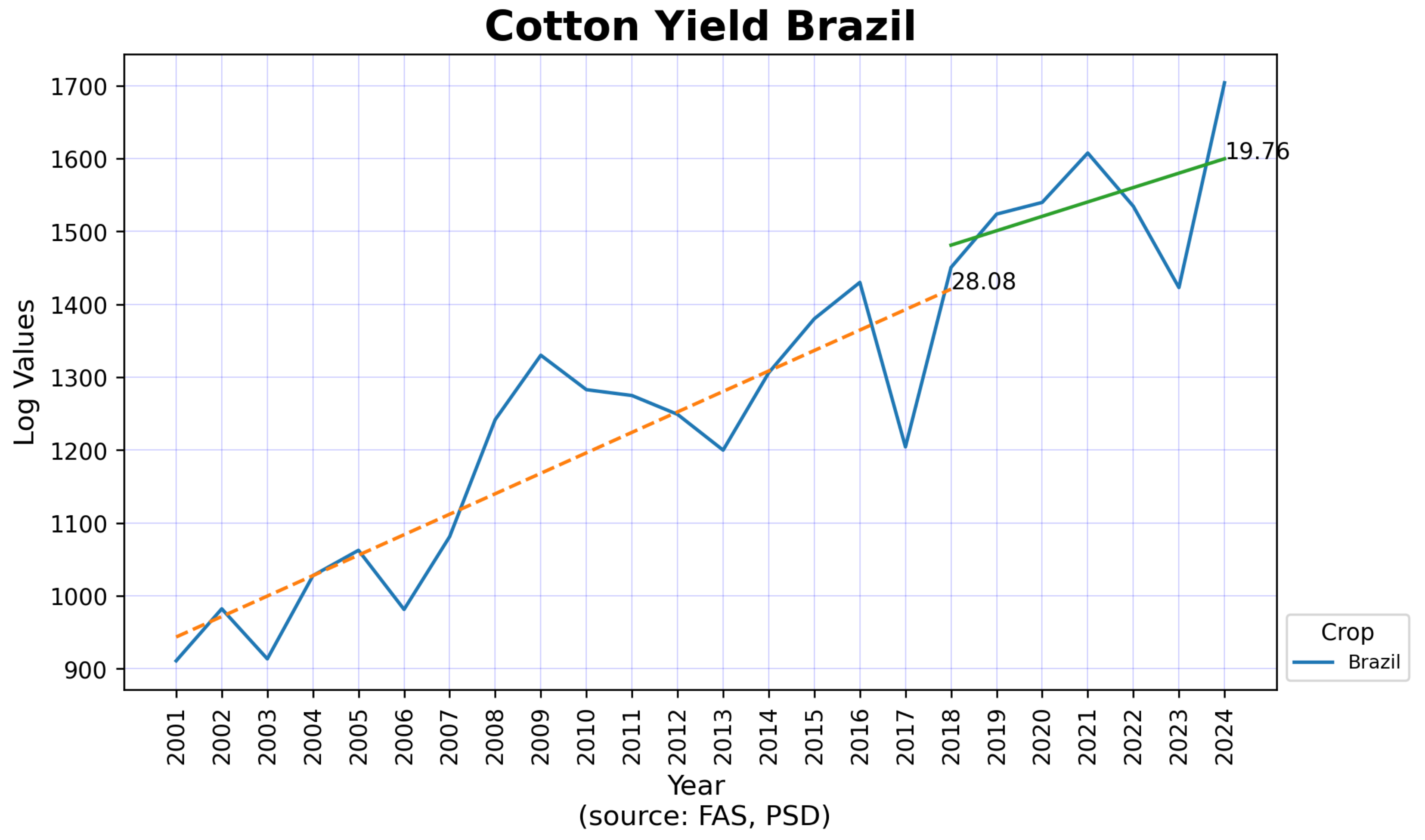

Cotton Acres Harvested Brazil
Log Values
8.4
8.2
8.0
7.8
7.6
0.08
0.02
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
Year
(source: FAS, PSD)
Crop
Brazil

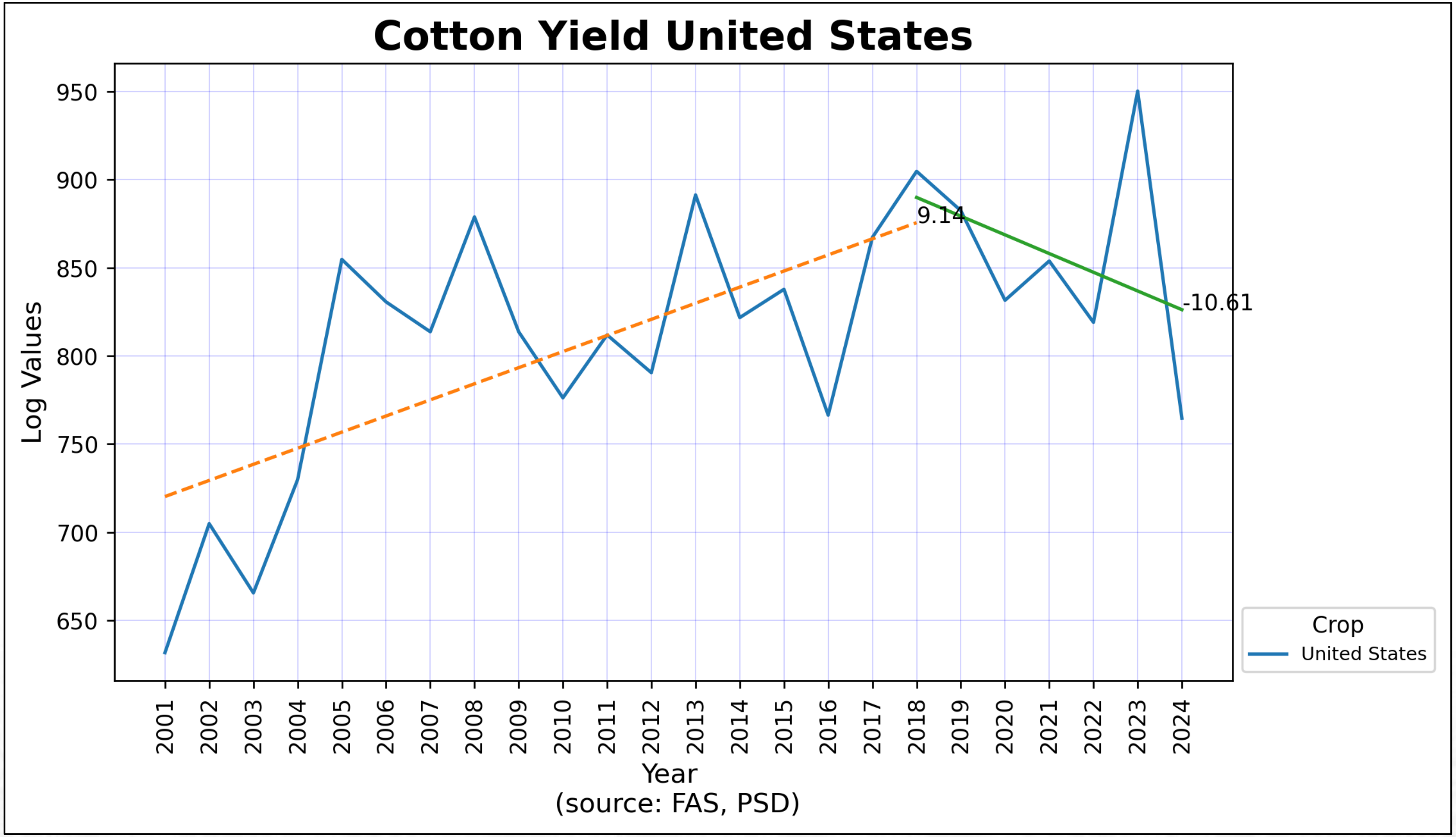


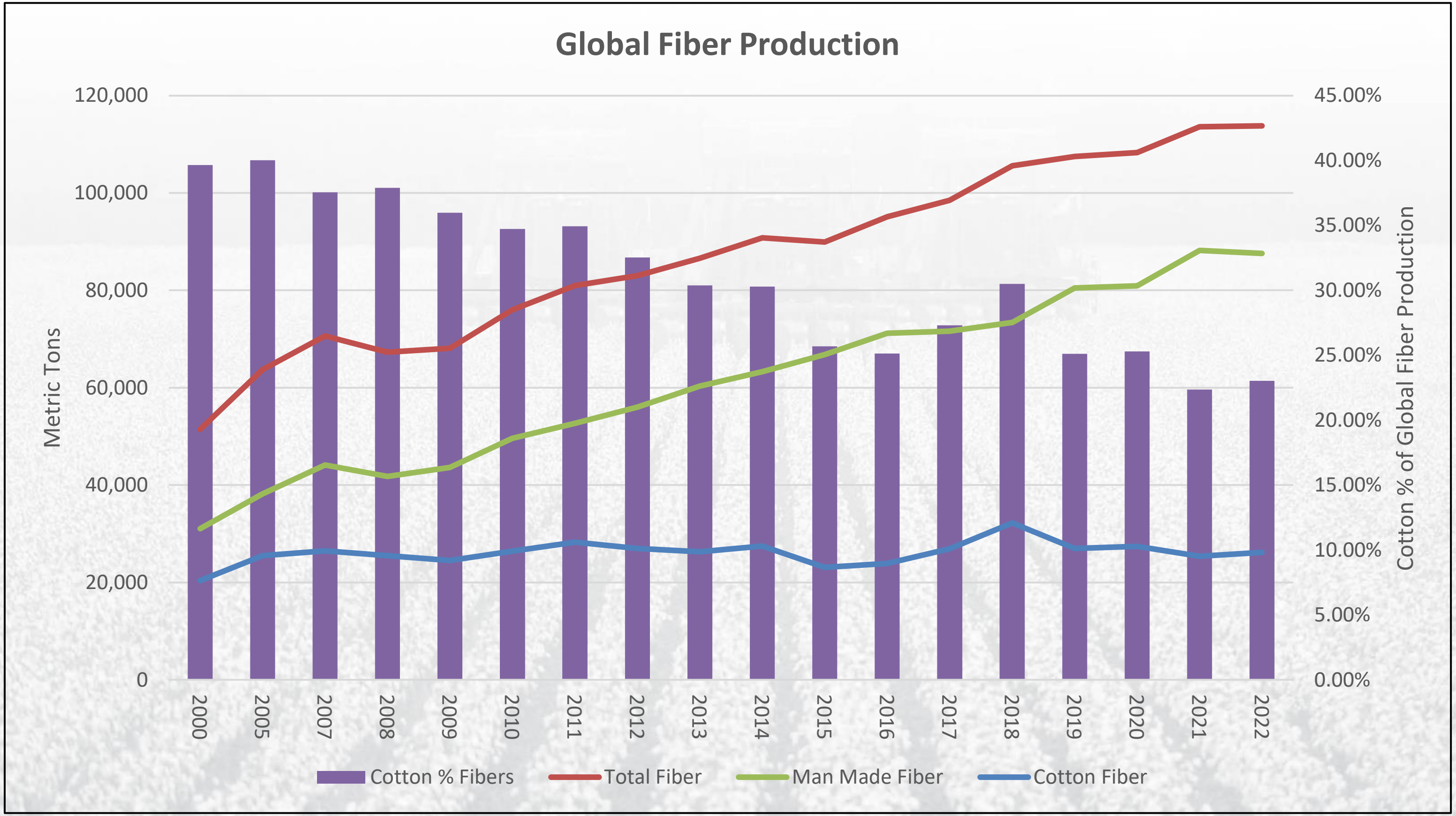
Cotton Yield World
Log Values
725
700
675
650
625
600
575
550
7.58
0.25
Crop
World
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
Year
(source: FAS, PSD)



Cotton Yield India
Log Values
500
450
400
350
300
250
11.95
-8.38
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
Year
(source: FAS, PSD)
Crop
India

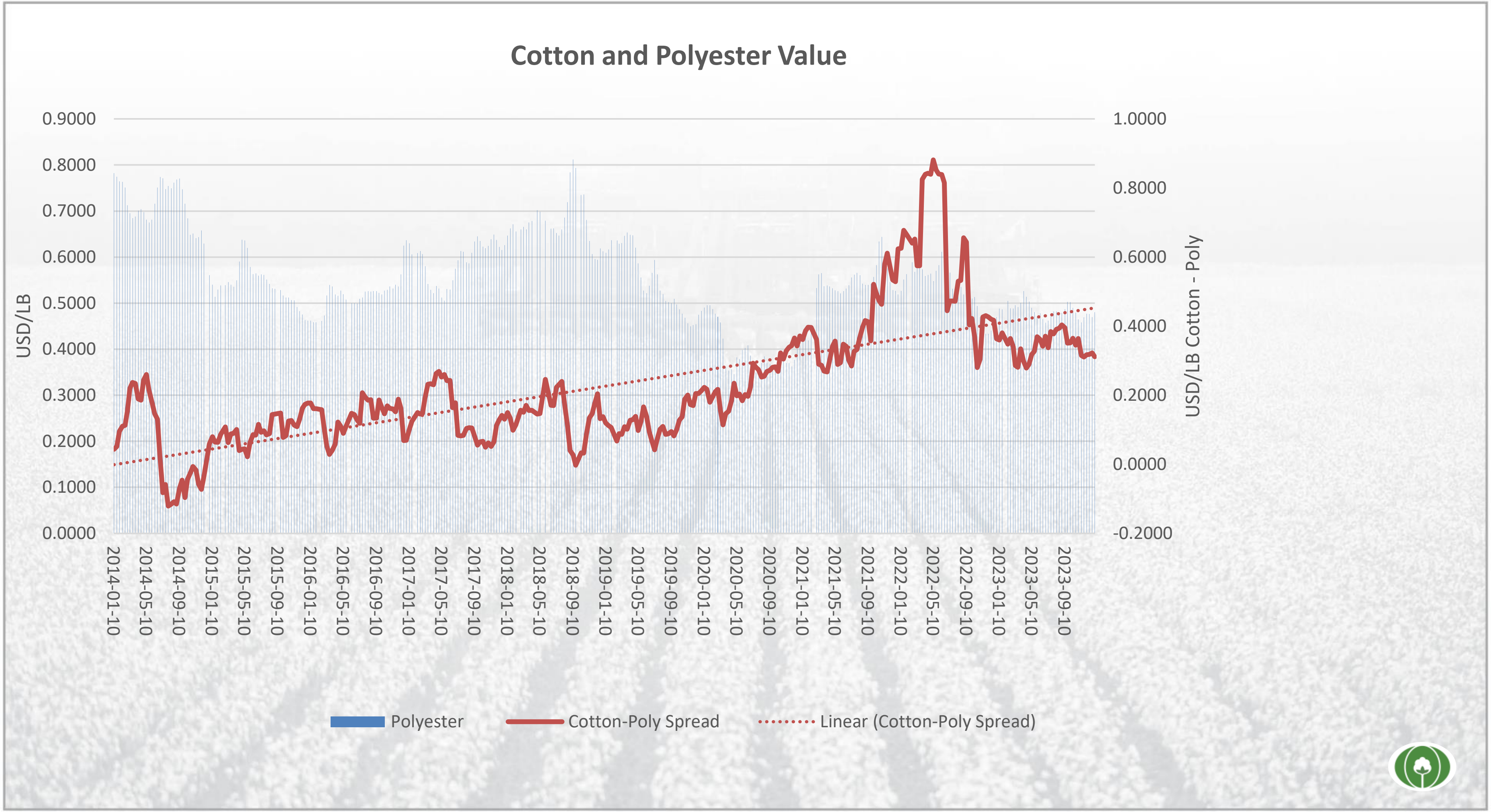

Cotton Yield Brazil
Log Values
1700
1600
1500
1400
1300
1200
1100
1000
900
19.76
28.08
Crop
Brazil
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
Year
(source: FAS, PSD)


Cotton Yield United States
950
900
850
800
750
700
650
Log Values
9.14
-10.61
Crop
United States
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
Year
(source: FAS, PSD)

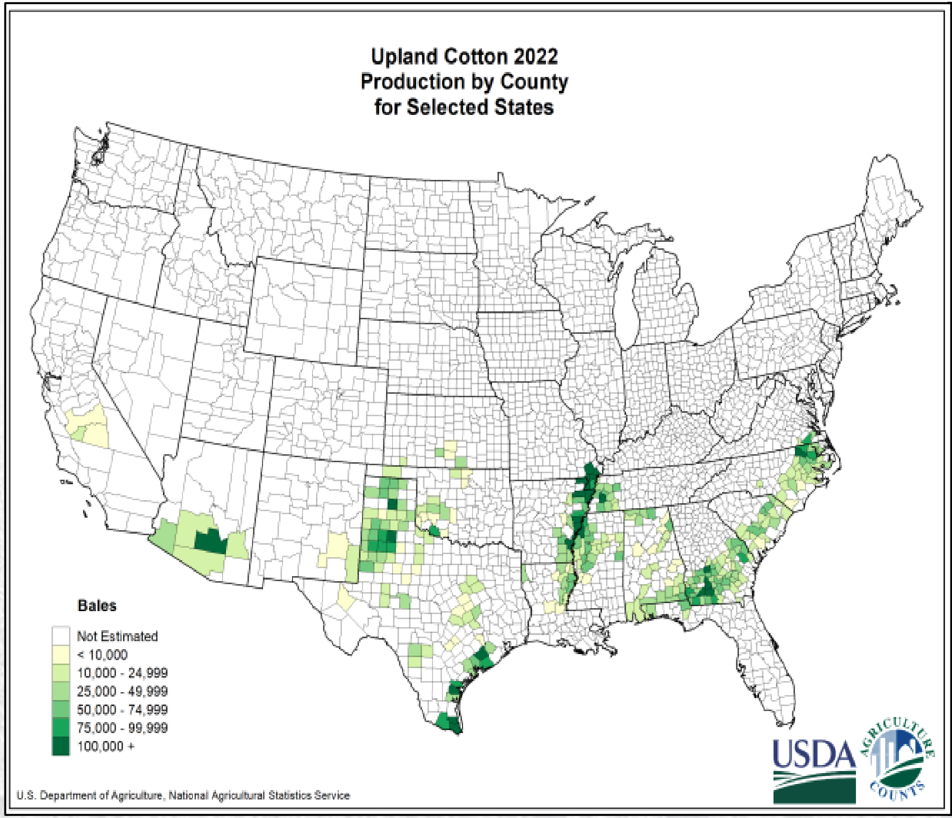


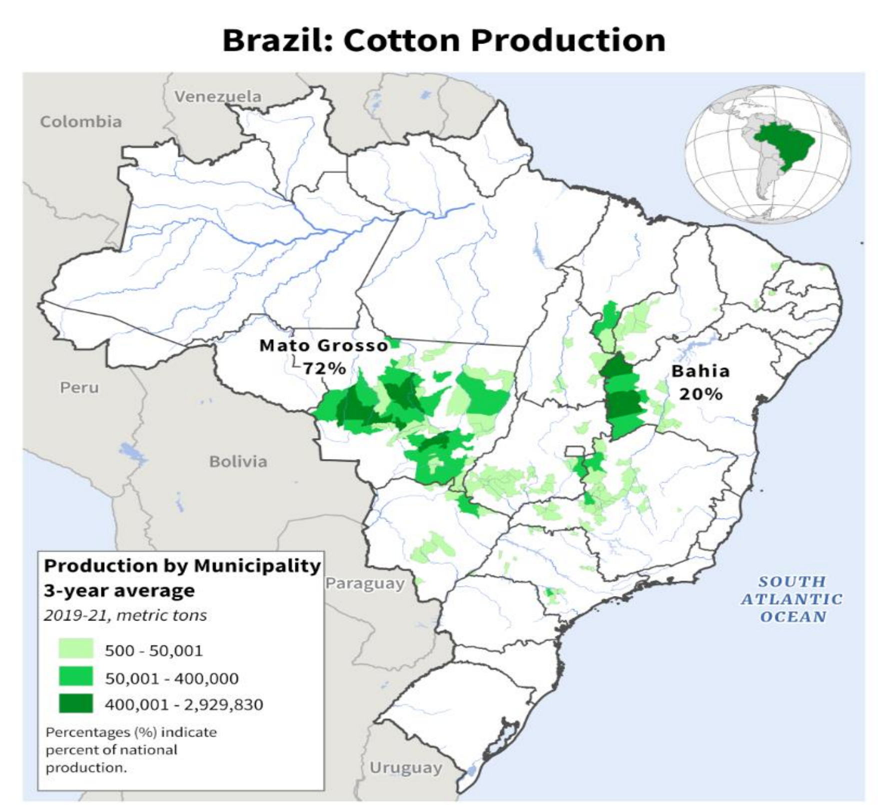
Global Fiber Production
120,000
100,000
80,000
60,000
40,000
20,000
0
Metric Tons
45.00%
40.00%
35.00%
30.00%
25.00%
20.00%
15.00%
10.00%
5.00%
0.00%
Cotton % of Global Fiber Production
2000
2005
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
Cotton % Fibers
Total Fiber
Man Made Fiber
Cotton Fiber

2011 HSBC Asian ad campaign



Cotton and Polyester Value
USD/LB
0.9000
0.8000
0.7000
0.6000
0.5000
0.4000
0.3000
0.2000
0.1000
0.0000
USD/LB Cotton - Poly
1.0000
0.8000
0.6000
0.4000
0.2000
0.0000
-0.2000
2014-01-10
2014-05-10
2014-09-10
2015-01-10
2015-05-10
2015-09-10
2016-01-10
2016-05-10
2016-09-10
2017-01-10
2017-05-10
2017-09-10
2018-01-10
2018-05-10
2018-09-10
2019-01-10
2019-05-10
2019-09-10
2020-01-10
2020-05-10
2020-09-10
2021-01-10
2021-05-10
2021-09-10
2022-01-10
2022-05-10
2022-09-10
2023-01-10
2023-05-10
2023-09-10
Polyester
Cotton-Poly Spread
Linear (Cotton-Poly Spread)


Upland Cotton 2022
Production by County
for Selected States
Bales
Not Estimated
< 10,000
10,000 - 24,999
25,000 - 49,999
50,000 - 74,999
75,000 - 99,999
100,000 +
USDA
AGRICULTURE COUNTS
U.S. Department of Agriculture, National Agricultural Statistics Service

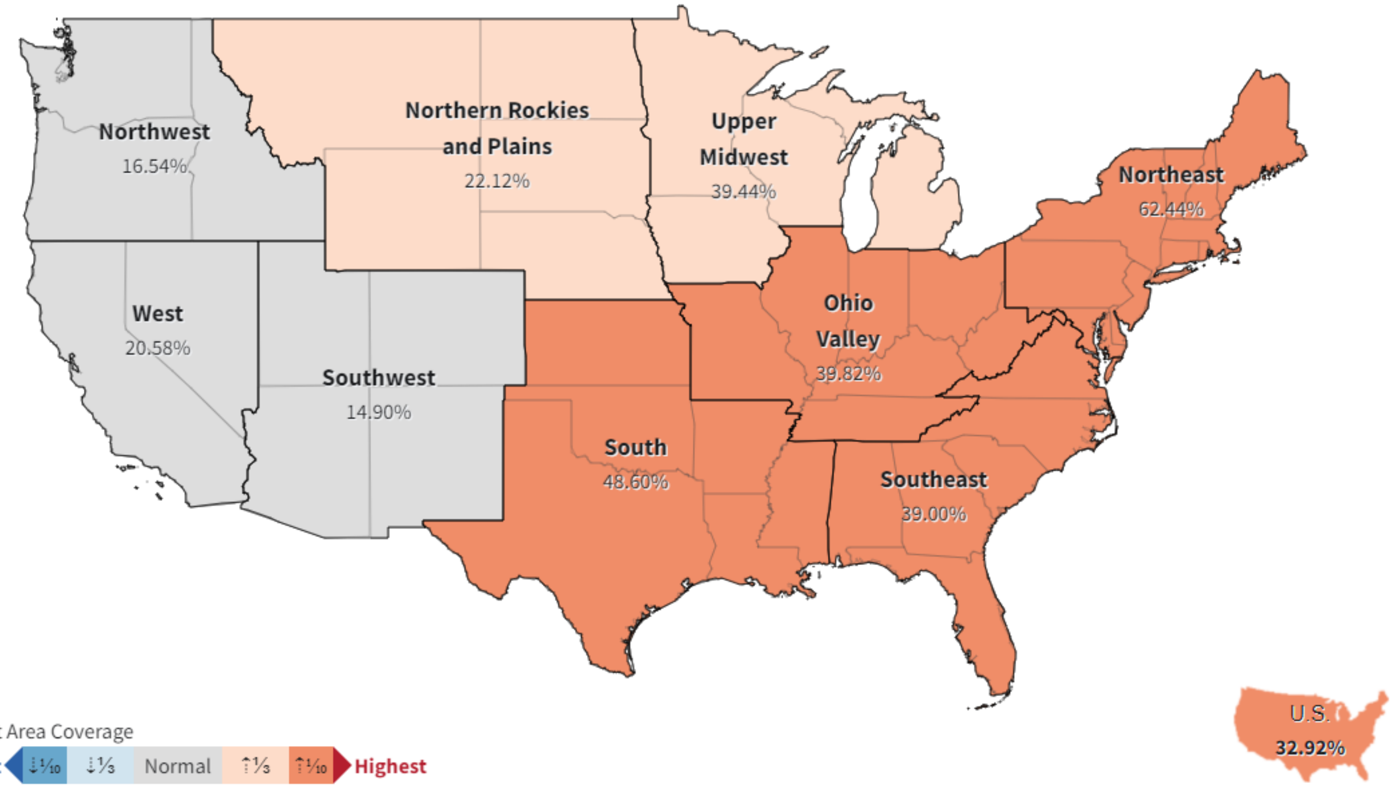

Brazil: Cotton Production
Venezuela
Colombia
Peru
Bolivia
Paraguay
Uruguay
Mato Grosso
72%
Bahia
20%
SOUTH
ATLANTIC
OCEAN
Production by Municipality
3-year average
2019-21, metric tons
500 - 50,001
50,001 - 400,000
400,001 - 2,929,830
Percentages (%) indicate
percent of national
production.

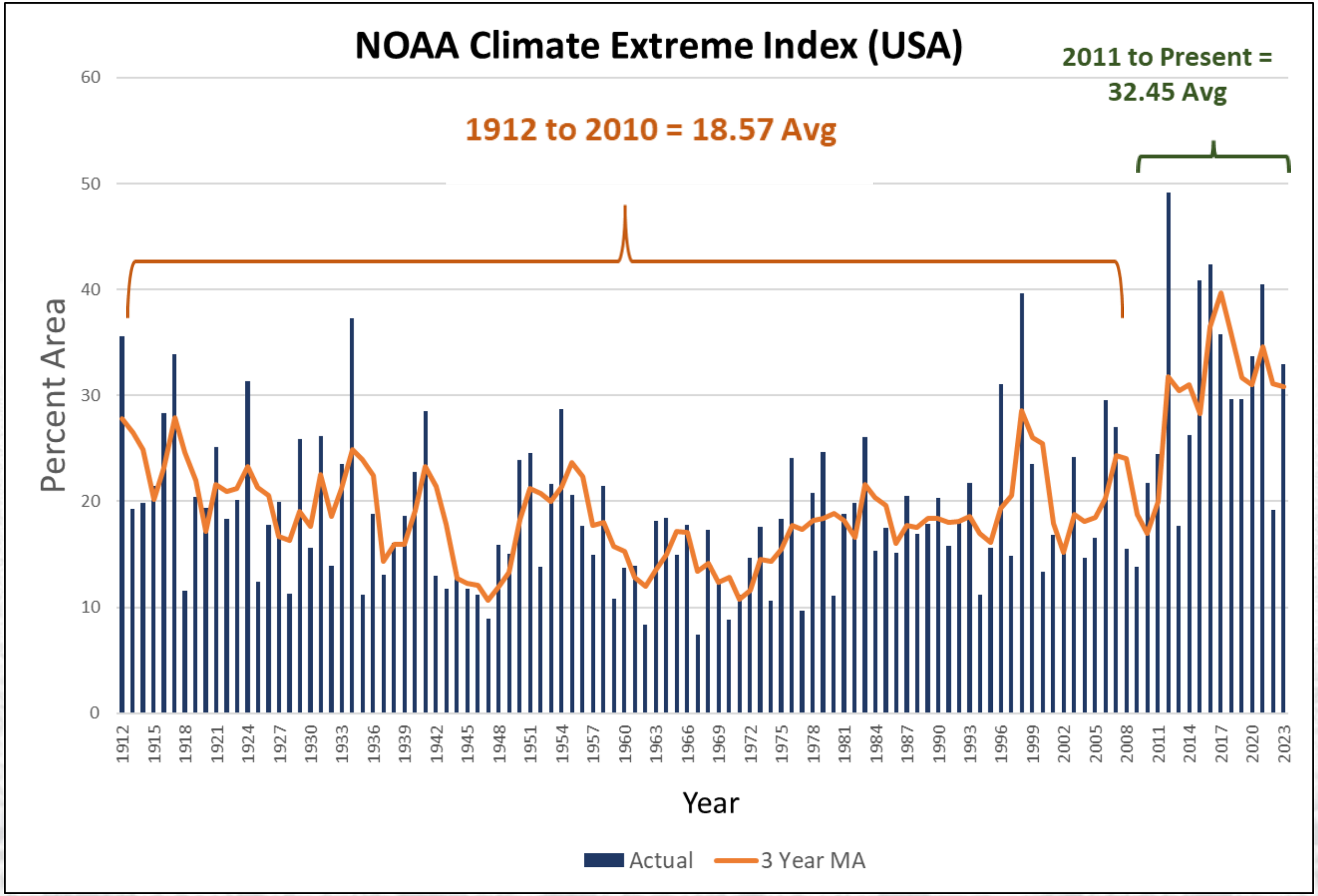
USA and Brazil Comparison Metrics

Metric	USA	Brazil
Harvested Cotton Acres(Million, 2023)	7.06	4.1
Average Yield (5 yr)	860	1561
Cost of Production (est.)	$.80 - $.85	$.72 - $.75
Picker Cost (approx.)	$1.06m	$1.8m
Acres per Machine (approx.)	1500	3200
Average Acres Per Farm (est.)	650	50,000

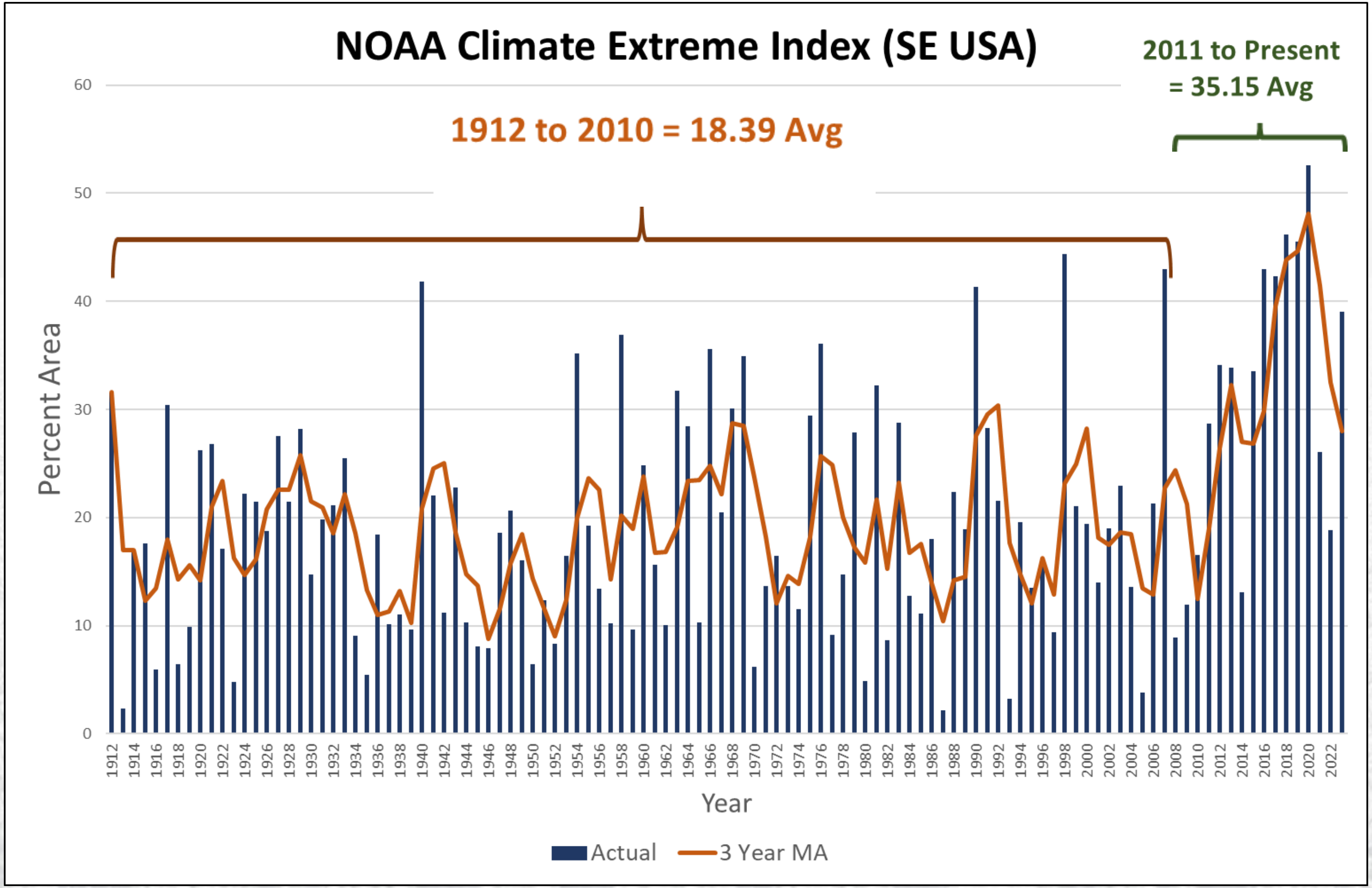
Climate Extremes Index (All Steps Combined)

Annual (January-December 2023)

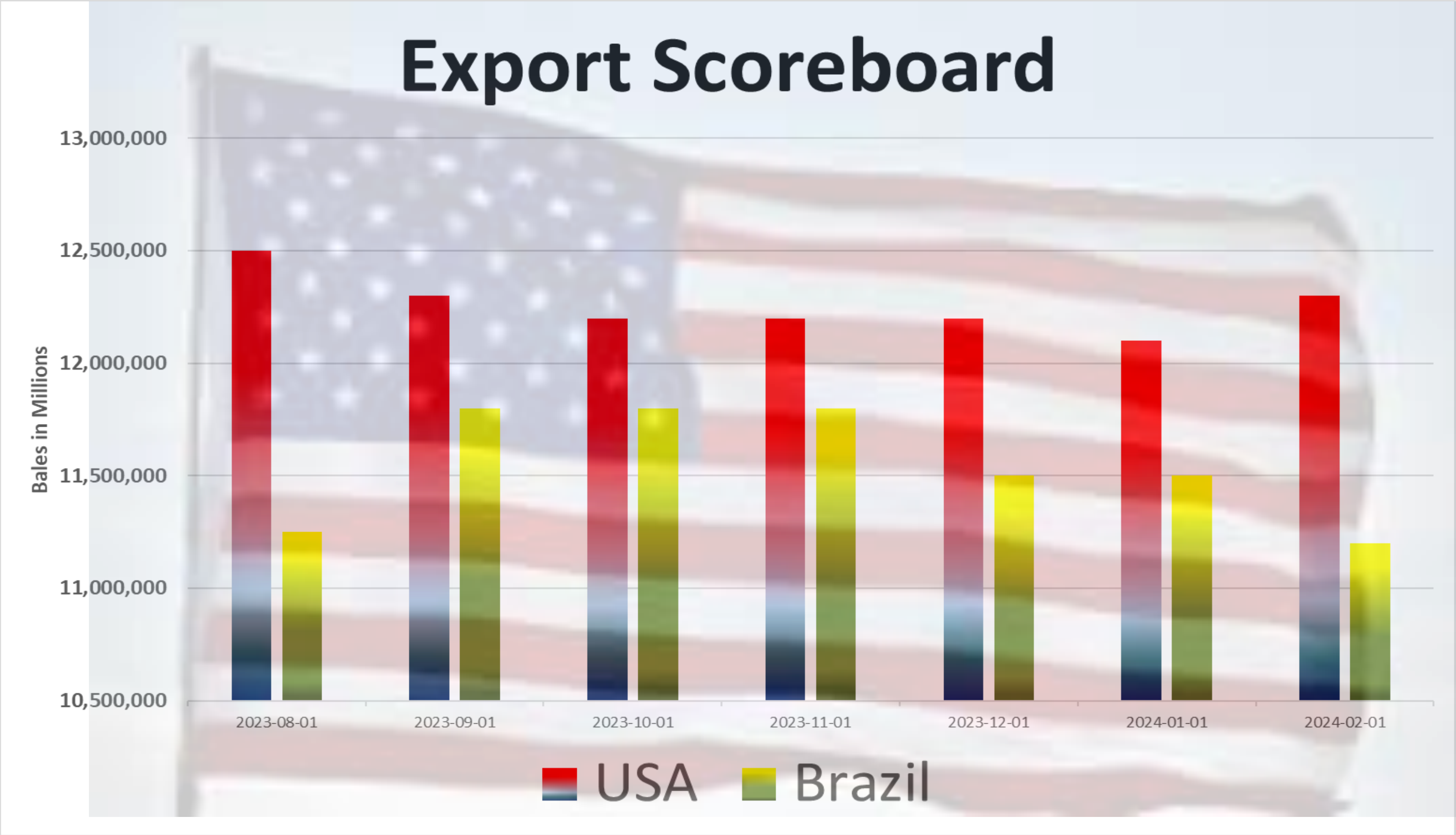




NOAA Climate Extreme Index (USA)
2011 to Present = 32.45 Avg
1912 to 2010 = 18.57 Avg
Percent Area
60
50
40
30
20
10
0
1912
1915
1918
1921
1924
1927
1930
1933
1936
1939
1942
1945
1948
1951
1954
1957
1960
1963
1966
1969
1972
1975
1978
1981
1984
1987
1990
1993
1996
1999
2002
2005
2008
2011
2014
2017
2020
2023
Year
Actual
3 Year MA



NOAA Climate Extreme Index (SE USA)
2011 to Present = 35.15 Avg
1912 to 2010 = 18.39 Avg
Percent Area
Year
Actual
3 Year MA



Export Scoreboard
13,000,000
12,500,000
12,000,000
11,500,000
11,000,000
10,500,000
Bales in Millions
2023-08-01
2023-09-01
2023-10-01
2023-11-01
2023-12-01
2024-01-01
2024-02-01
USA
Brazil

Conclusions

- Demand for cotton will be relatively consistent with production, outside of recession periods

- Brazil has made tremendous progress expanding acres and increasing production
  - The world should be thankful for the additional production from Brazil
    if population continues to expand, more will be needed

- Significant further increase in cotton production will largely be dependent on increased yields

- Volatility will become more extreme with expanded commodity investment and weather impacts

- USA cotton production will be highly dependent on Texas weather

- Brazil cotton production will be more dependent on profitability of corn/beans vs cotton

- There is room for both the USA and Brazil productions in the textile supply chain
  - Because of the dislocation between production and consumption geography, ability to move product to market will be increasingly important
- USA's competitiveness in the export market will be directly correlated to Texas production, the more Texas produces, the more the USA will export
  - There will likely be a year in the near future when Brazil exports more cotton than the USA

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