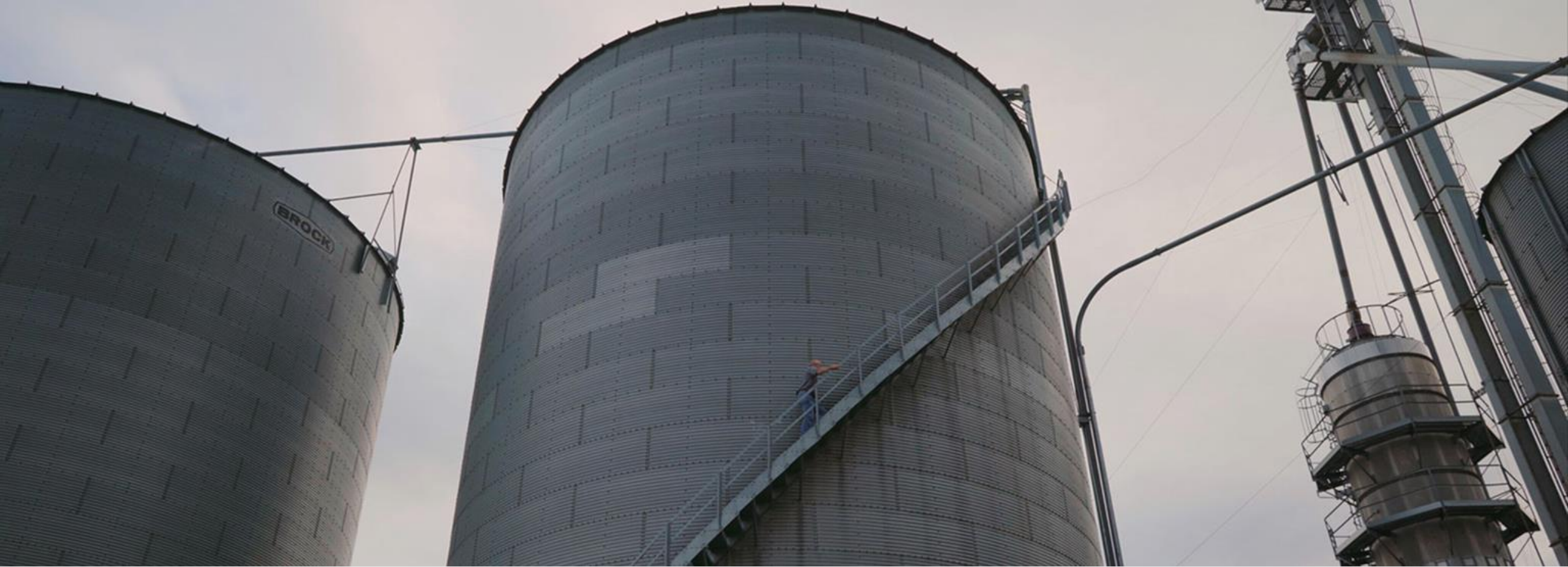




NCGA State of the Corn Economy

April 2023





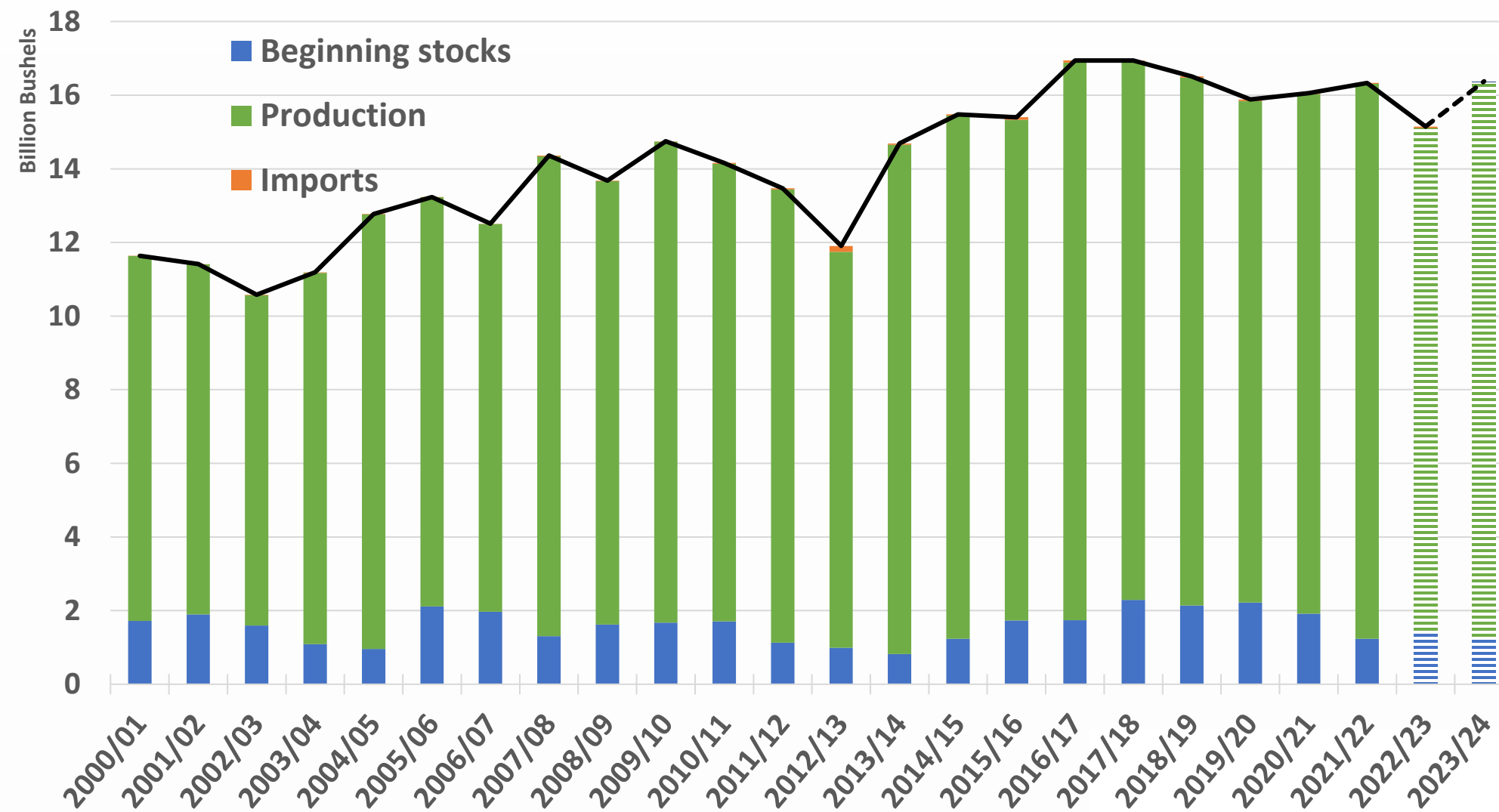
Corn Balance Sheet



U.S. Corn Supply



Decline in production resulted in a decline in total supply for 2022/23, record high production forecast for 2023 crop



+8.1%

Change in Total Supply

15.1 B bu. 2022/23

16.4 B bu. 2023/24

+9.9%

Change in Production

13.7 B bu. 2022/23

15.1 B bu. 2023/24

-8.0%

Change in Beg. Stocks

1.38 B bu. 2022/23

1.27 B bu. 2023/24

U.S. Corn Supply Projection Comparison



U.S. Corn Balance Sheet

	2020/21	2021/22	2022/23	2023/24		
	Actual	USDA Est.	USDA Proj.	USDA Outlook	Updated Outlook	FAPRI
<i>Million Acres</i>						
Production						
Area Planted	90.7	93.3	88.6	91.0	92.0	92.2
Area Harvested	82.3	85.3	79.2	83.1	84.0	84.3
<i>Bushels/Acre</i>						
Yield Per Harvested Acre	171.4	176.7	173.3	181.5	181.5	181
<i>Million Bushels</i>						
Supply						
Beginning Stocks	1,919	1,235	1,377	1,267	1,342	1,243
Total Production	14,111	15,074	13,730	15,085	15,248	15,259
Imports	24	24	40	25	25	34
Total Supply	16,055	16,333	15,147	16,377	16,615	16,536

Planting Intentions Report planted acres and proportional harvested acres

Carryover of current projected ending stocks for 2023/24

Production result of adjusted acres with same yield

Supply result of updated stocks and production

-10 Mil Bu

Imports reduced in April WASDE, Total Supply reduced by same amount

1.2 Mil Acres

Range between USDA Grain & Oilseeds Outlook, USDA Planting Intentions, and FAPRI projections for planted acres

U.S. Corn Demand



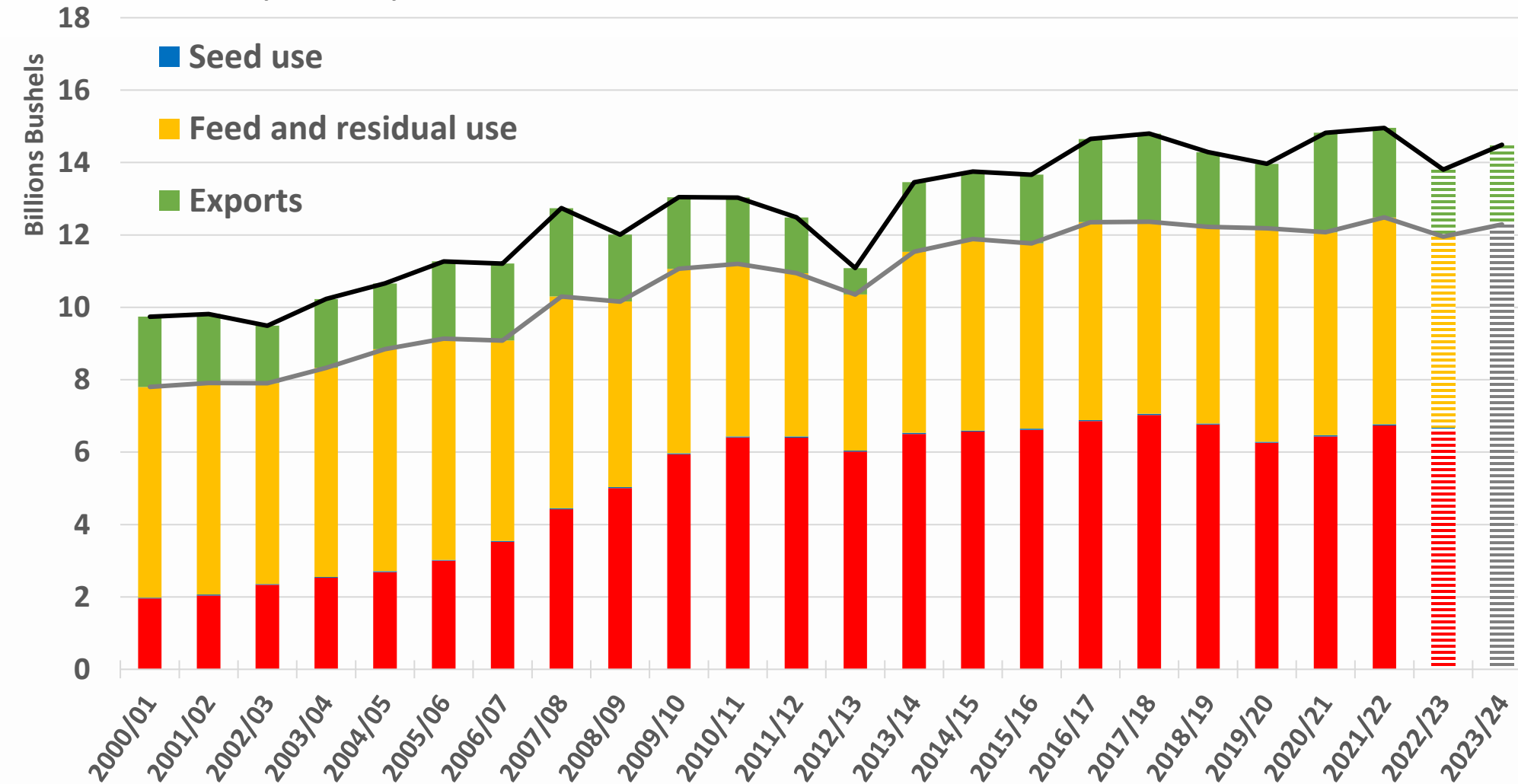
Forecast declines for all major corn demand categories push total use lower for 2022/23, but steady growth in 2023/24

■ Food, alcohol, and industrial use

■ Seed use

■ Feed and residual use

■ Exports



+5.0%

Change in Total Use

13.8 B bu. 2022/23

14.5 B bu. 2023/24

+18.9%

Change in Exports

1.85 B bu. 2022/23

2.20 B bu. 2023/24

+2.8%

Change in Dom. Use

12.0 B bu. 2022/23

12.3 B bu. 2023/24

U.S. Corn Supply Projection Comparison



U.S. Corn Balance Sheet

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Imports	24	24	40	25	25	34
Total Supply	16,055	16,333	15,147	16,377	16,615	16,536
Consumption						
Feed & Residual	5,607	5,721	5,275	5,600	5,600	5,572
Food, Seed, & Industrial	6,467	6,764	6,680	6,690	6,690	6,849
<i>Ethanol</i>	5,028	5,326	5,250	5,250	5,250	5,384
<i>Other FSI</i>	1,439	1,438	1,430	1,440	1,440	1,465
Exports	2,747	2,471	1,850	2,200	2,200	2,349
Total Consumption	14,821	14,956	13,805	14,490	14,490	14,770
Ending Stocks	1,235	1,377	1,342	1,887	2,125	1,766
Stocks-to-Use Ratio (%)	8.3%	9.2%	9.7%	13.0%	14.7%	12.0%
Average Price (\$/bu)	\$4.53	\$6.00	\$6.60	\$5.60	\$5.60	\$5.32

-10 Mil Bu
Food, Seed, &
Industrial Use reduced
in April WASDE, not
from Ethanol

Total Consumption
reduced by the same
amount

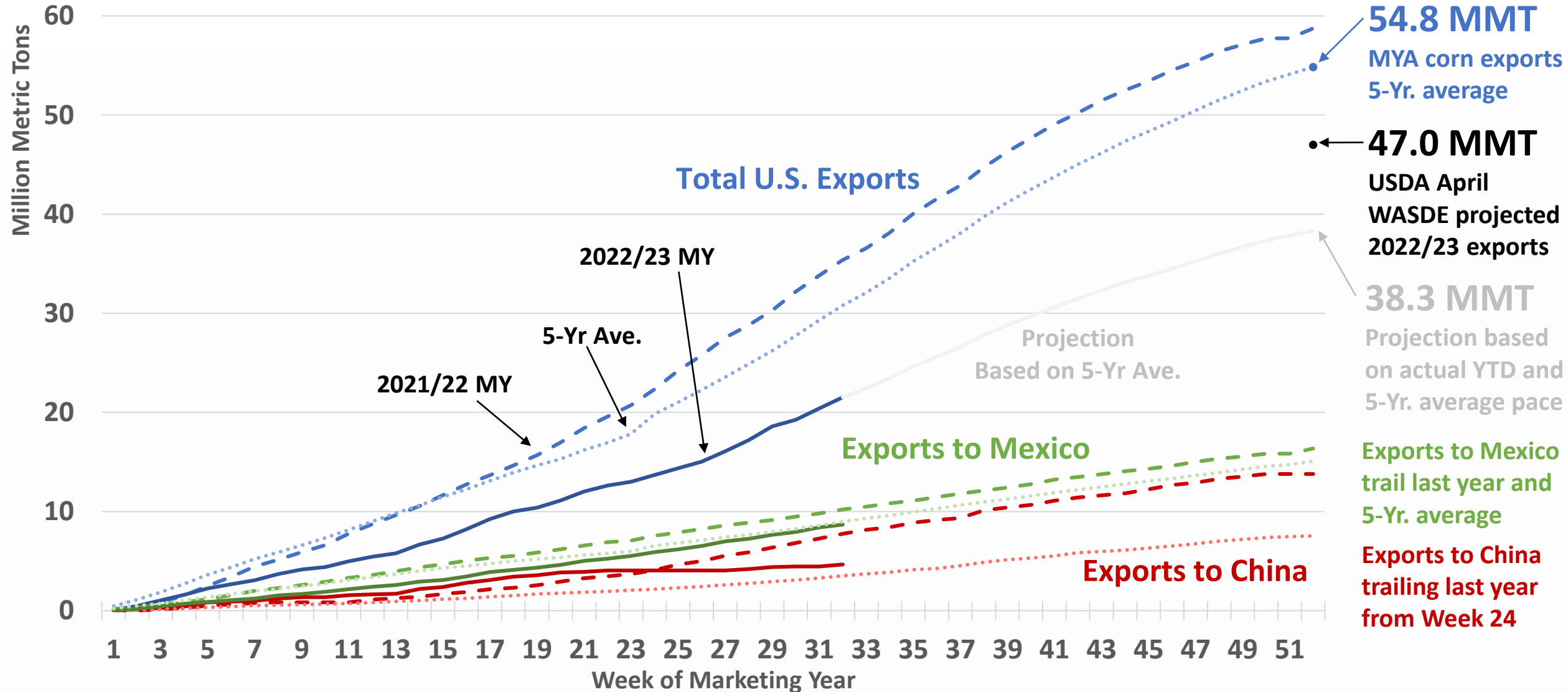
USDA will have update
for consumption in
May 2023 WASDE

Ending stocks result of supply
side change with same
assumptions for consumption

Marketing Year Accumulated Corn Exports



Accumulated exports are trailing last year and 5-year average, need to pick up pace to reach projection

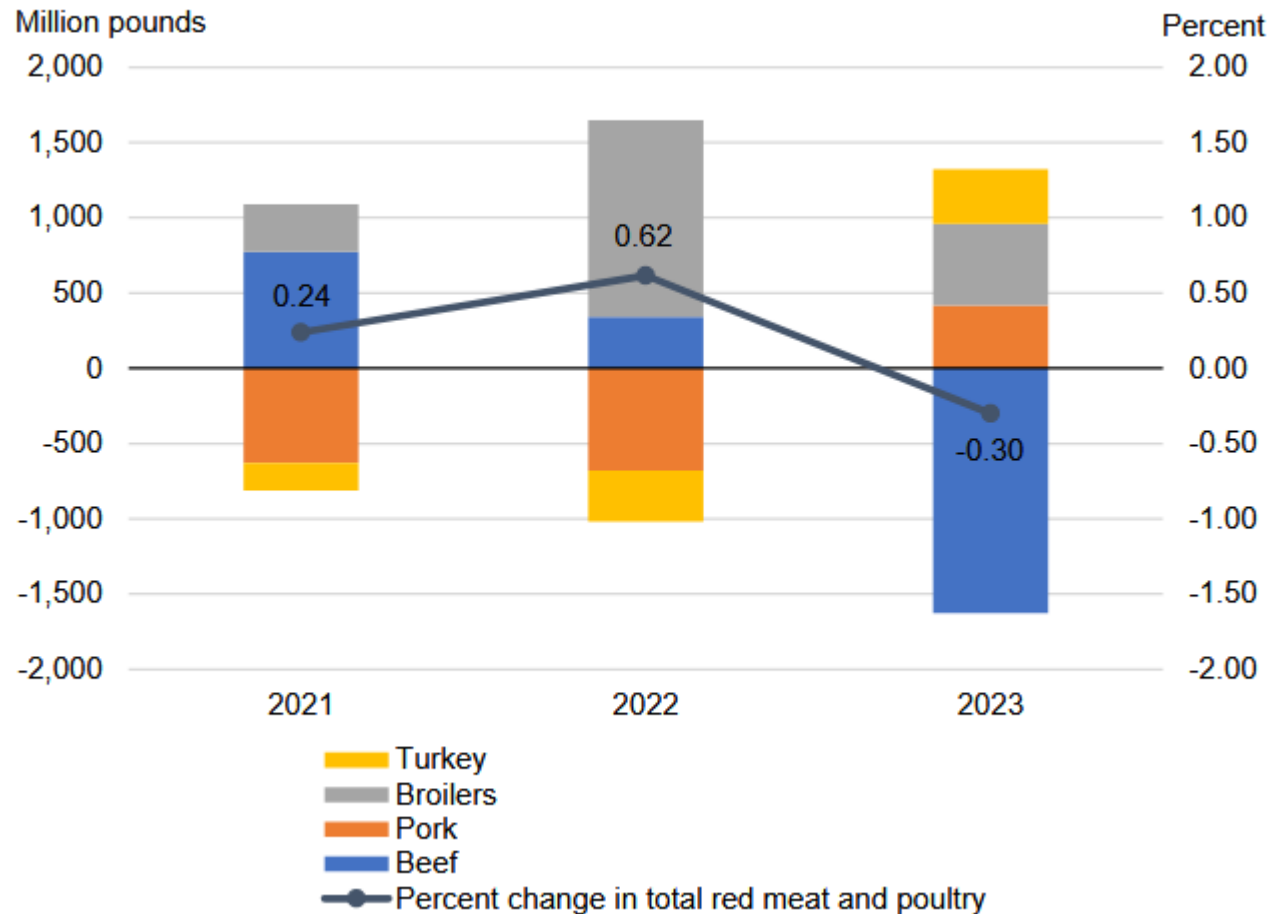


USDA Livestock & Poultry Outlook



Feed use is challenged by forecast for weaker livestock production, beef cattle at lowest inventories in more than six decades

Year-over-year changes in red meat and poultry production



Source: USDA, World Agricultural Supply and Demand Estimates.

+6.9%

2023 forecast turkey production to increase 363 million lbs. from 2022

+1.2%

2023 forecast broiler production to increase 544 million lbs. from 2022

+1.5%

2023 forecast pork production to increase 416 million lbs. from 2022

-5.7%

2023 forecast beef production to decline 1,626 million lbs. from 2022

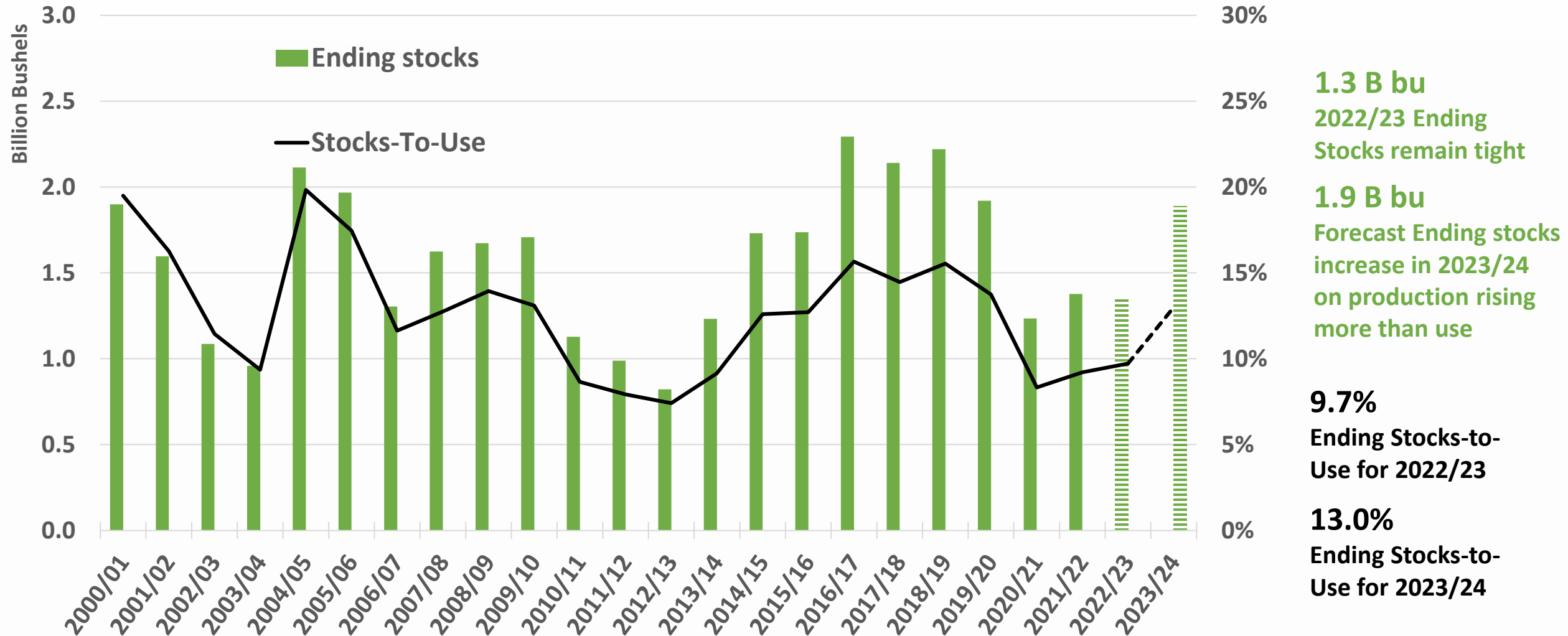
-0.3%

2023 forecast red meat and poultry production to decline 323 million lbs. from 2022

U.S. Ending Stocks & Stocks-to-Use Ratio



Tight supply and low stocks-to-use ratio remain for 2022/23, but widen for 2023/24 without production shortfall or demand growth



Price Trends



Little deviation from the \$6.60 MYA price for 2022/23 is expected, current USDA 2023/24 MYA projection is a dollar lower at \$5.60

Historical Market Year Average Prices



Much of the 2022/23 MYA price is already locked in, and current prices are also near projected price levels

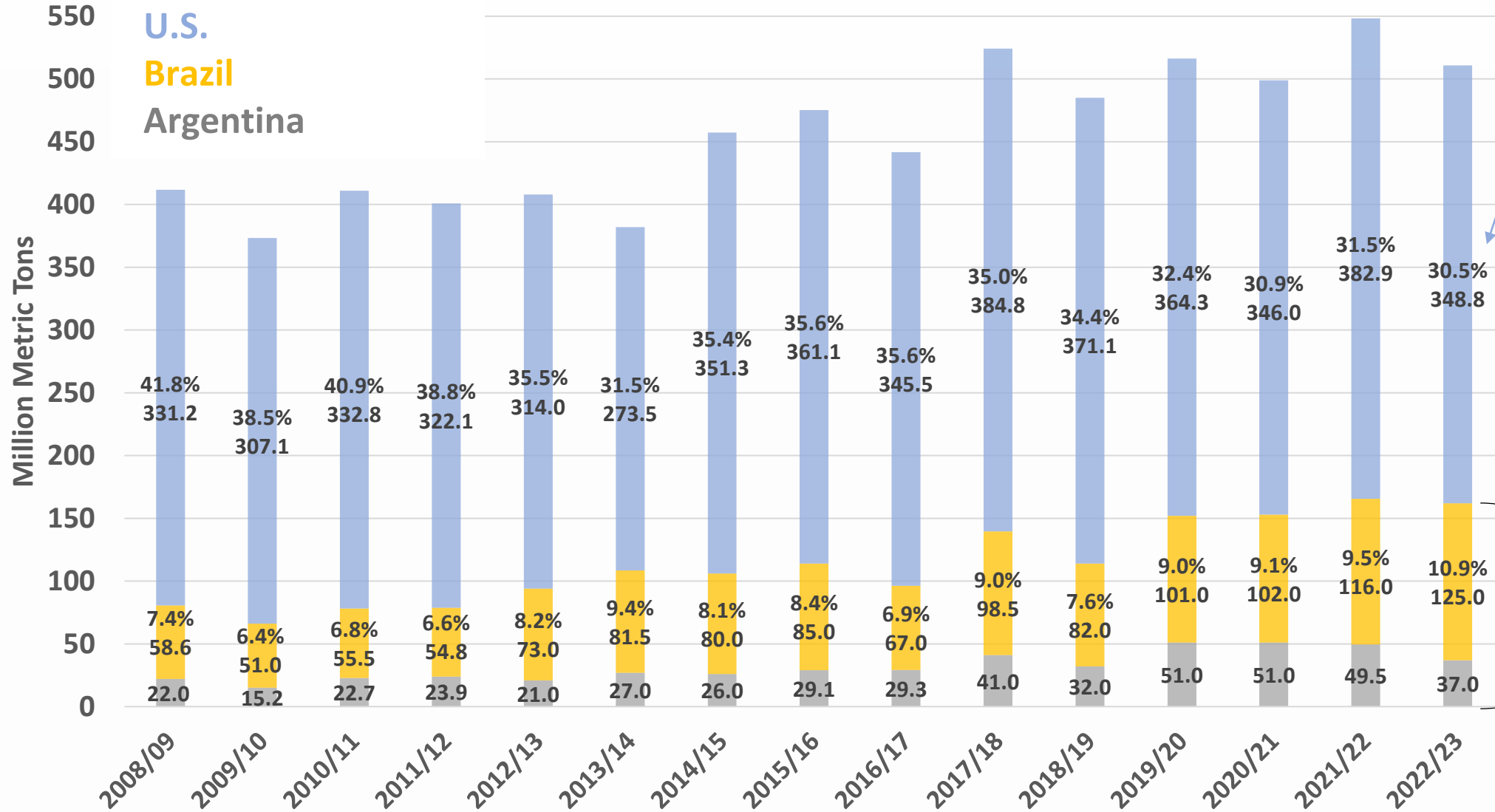
The USDA price projection for 2023/24 released in February is **\$5.60**, the more recent FAPRI projection released in March is **\$5.32**, the December 2023 futures price is currently **\$5.55**

USDA's next potential update for price projection is the May WASDE report

South America Production



Drought reduced forecast for Argentina is mostly offset by increased production in Brazil



30.5%

The U.S. produced 348.8 MMT of corn for 2022/23 marketing year, 30.5% of world production

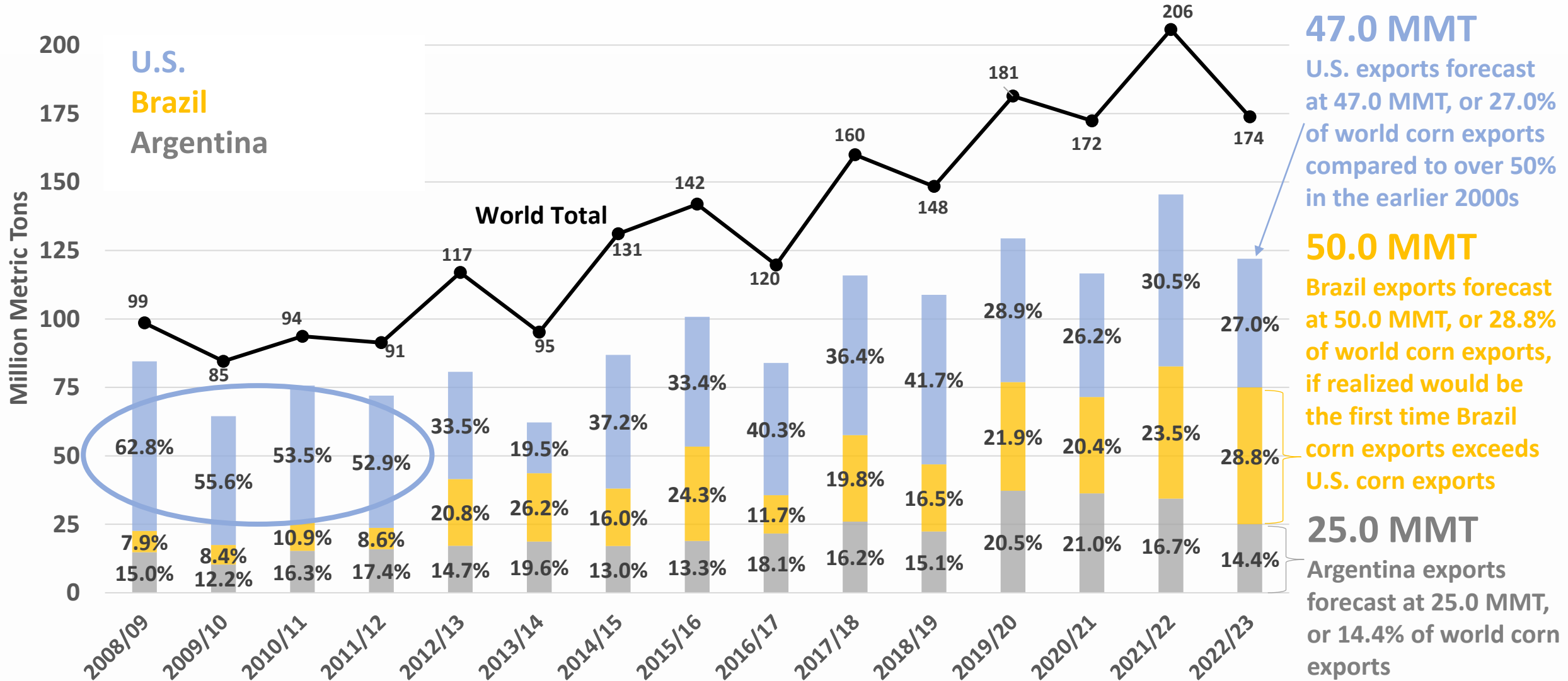
162.0 MMT

Higher production in Brazil mostly offsets declines in Argentina, together the two nations projected production is 162.0 MMT, lower than 165.5 MMT in 2021/22, but this translates to a larger share of world production at 14.2%, due to lower U.S. production in 2022

South America Exports



As production has increased in Brazil & Argentina, the two nations have grown to become major corn exporters





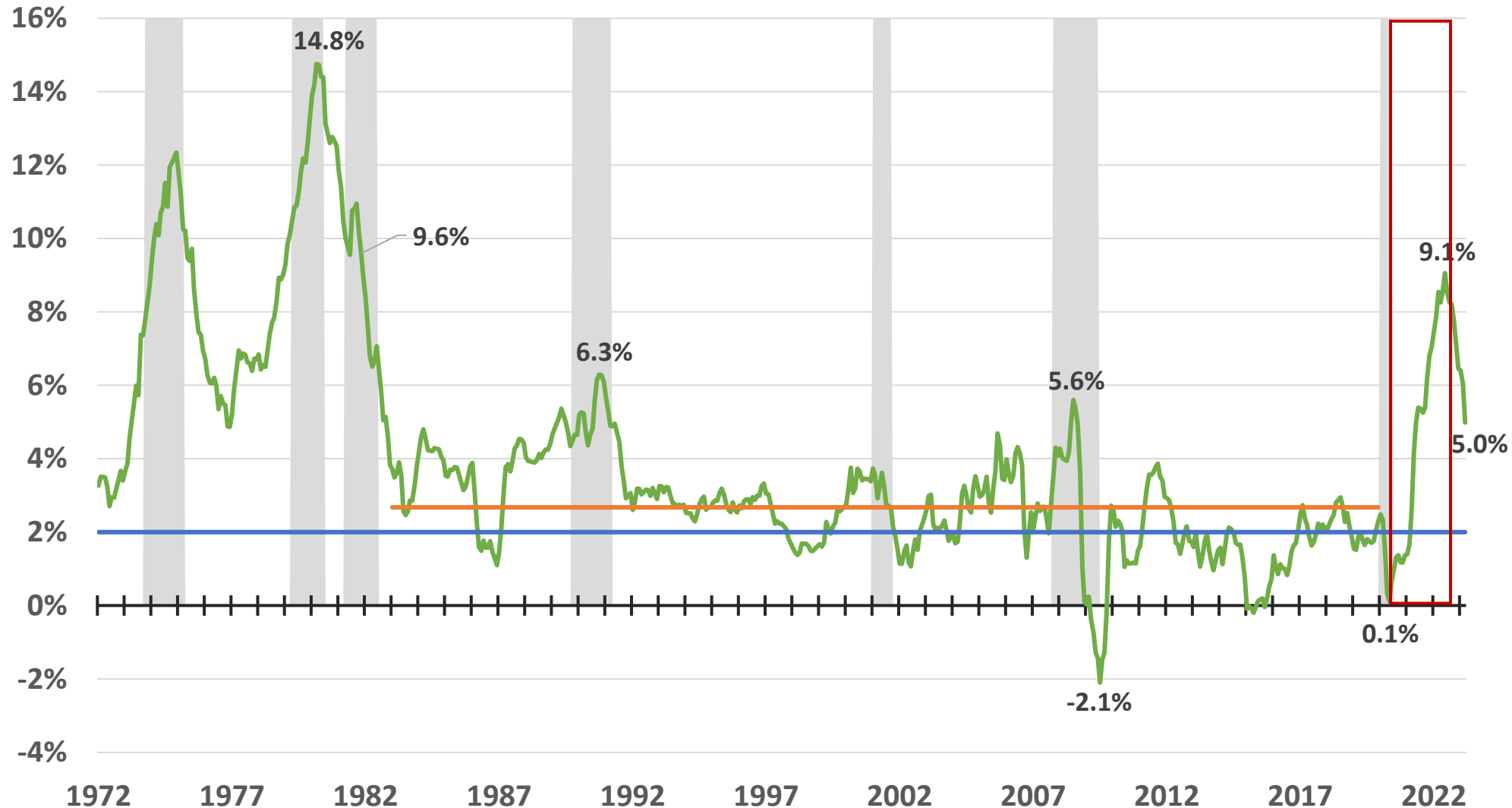
Macroeconomics & Outside Markets



Inflation – Consumer Price Index



After about four decades of relatively low inflation, inflation spiked in 2022 to rates not experienced since 1981



>40%

Increase in Money Supply!

9.1%

June 2022 Peak

5.0%

March 2023 Current

BUT Core CPI up 5.6%

up from 5.5% in Feb

2.7%

Average inflation

1983-2019

2.0%

Federal Reserve Target

Inflation Rate

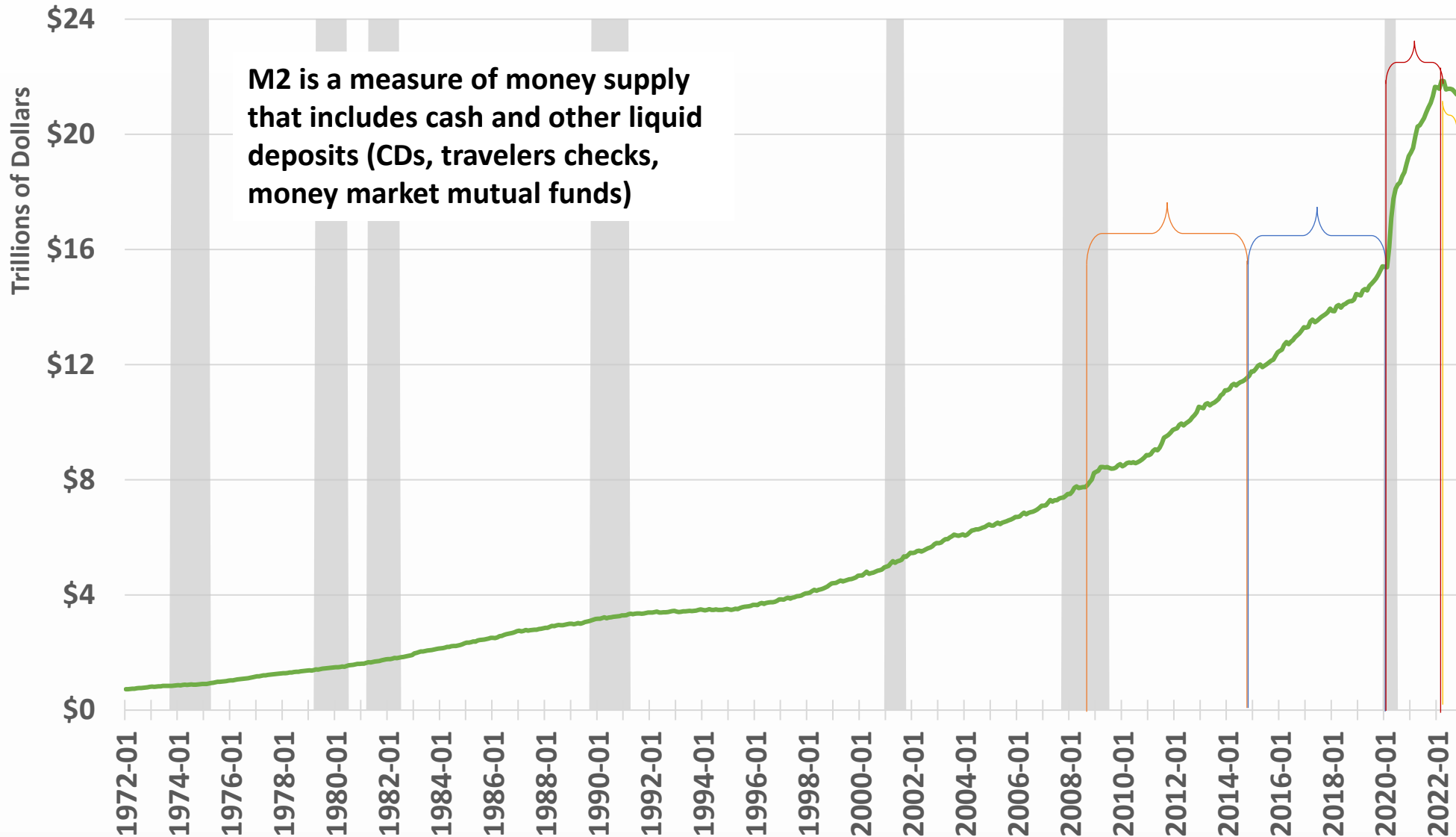
Data Source: U.S. Bureau of Labor Statistics: Annual Percent Change by Month in CPI, All items in U.S. city average, all urban consumers, not seasonally adjusted.

NCGA Calculations.

Rapid Increase in Money Supply



The Fed used Quantitative Easing to expand money supply more than 40% in a 2.25 year period



34%

5 Year Increase in M2 Money Supply from Jan 2009 to Jan 2014

39%

6 Year Increase in M2 Money Supply from Jan 2014 to Jan 2020

42%

2.25 Year Increase in M2 Money Supply from Jan 2020 to April 2022

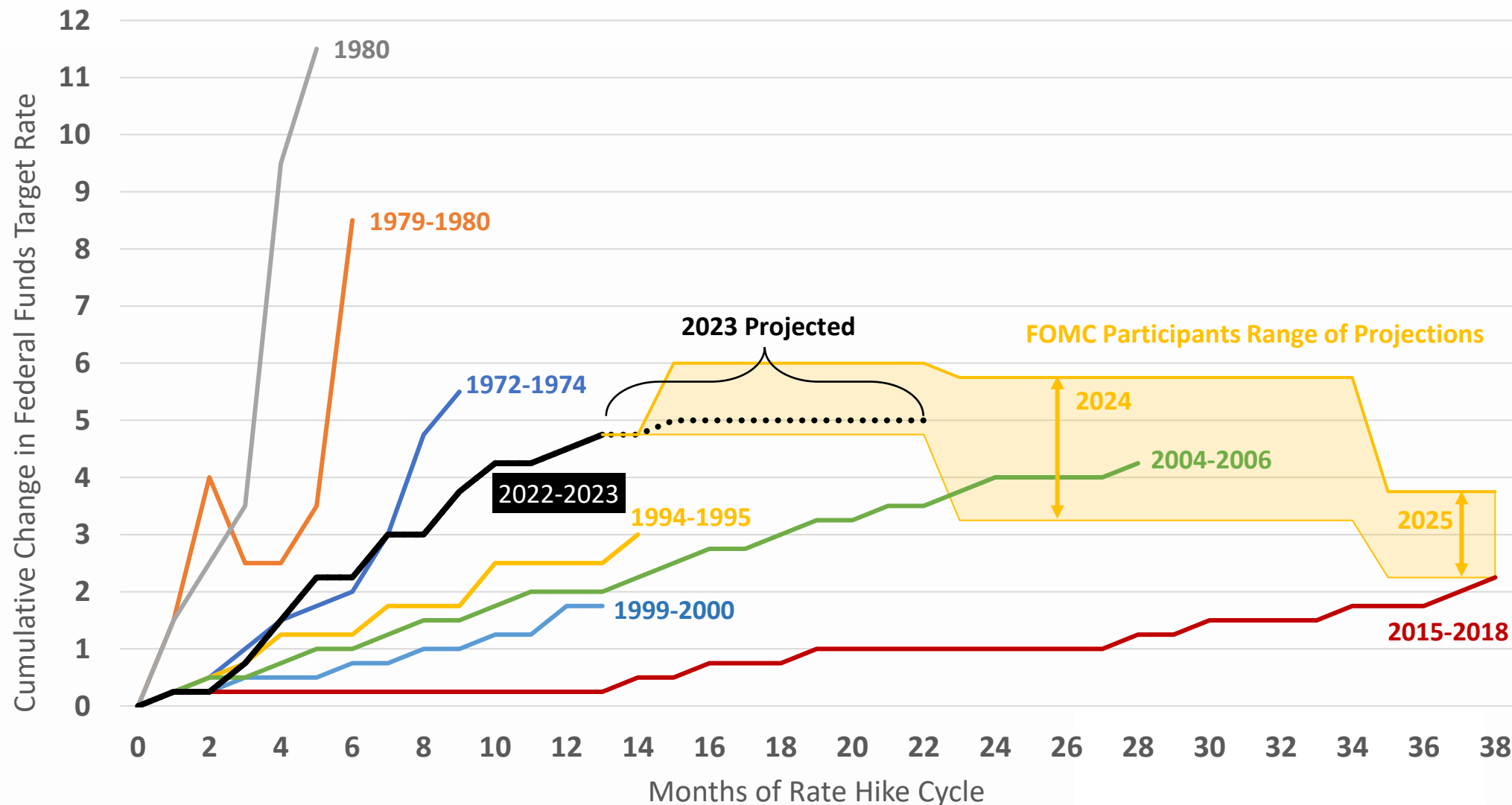
2.76%

9 Month Decrease in M2 Money Supply from April 2022 to Jan 2023

Interest Rate – Changes in Fed Funds Rate



Throughout history the Federal Reserve uses monetary policy actions to increase the federal funds rate



Since the 1990s the Federal Reserve has taken a slow, steady approach when raising rates

4.75%

Rates raised from 0.25% to 4.75% in 12 months

More aggressive than pace of rate hike cycles since the 1980s

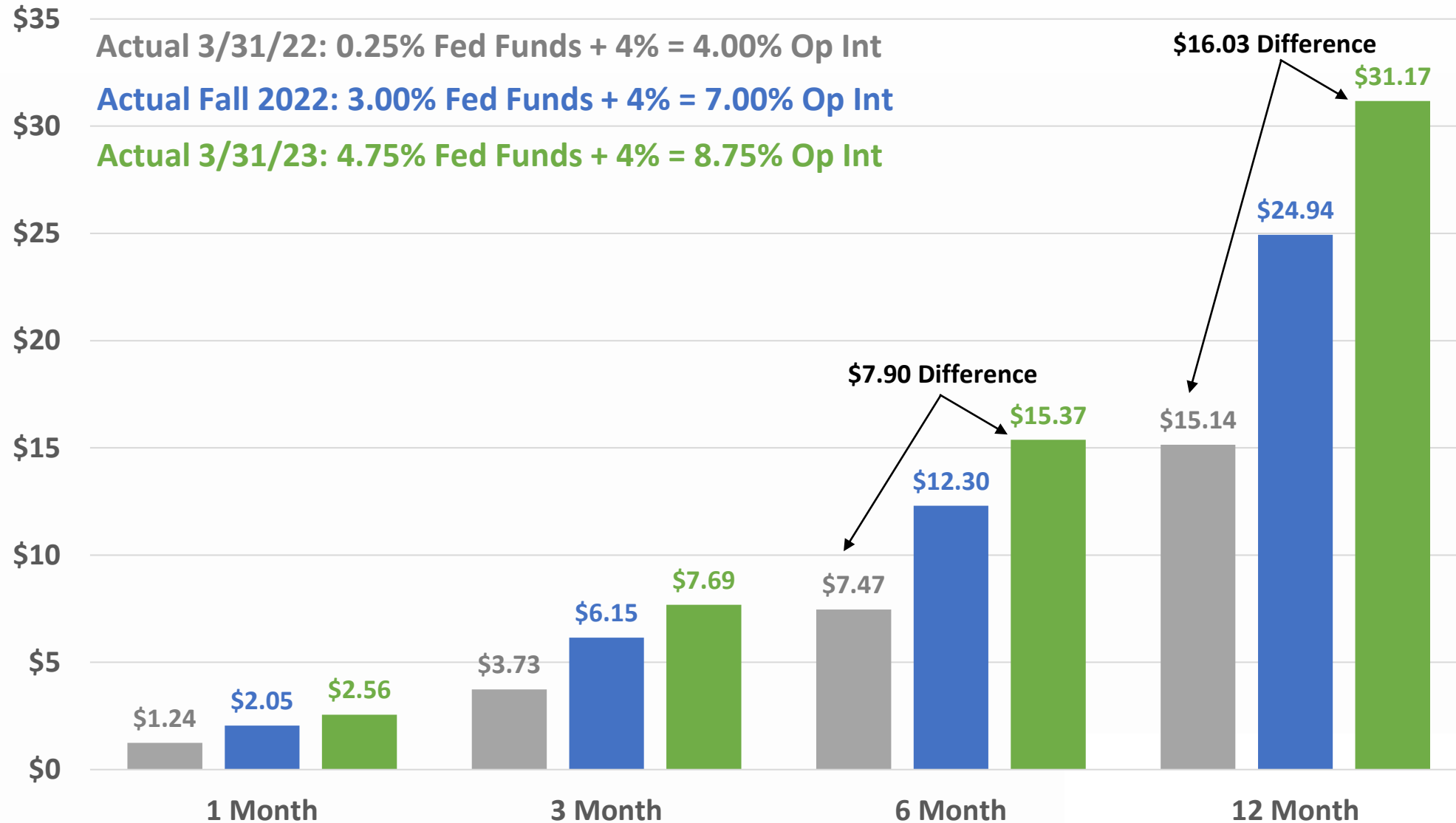
5.00%

Fed comments indicate one more 25 BPS increase at May meeting and then holding

Farm Operating Interest – Op Cost Example



When operating interest rates move with the federal funds rate, farm operating interest costs are much higher than a year ago



Example:

\$475/acre variable costs for corn borrowed on operating loan with interest rate 4% higher than Fed Funds Rate

2+ BU/ACRE

The increase in operating interest costs to finance average variable cost of production for corn equates to about 1 to 2+ bushels added expense per acre, depending on time financed

Exchange Rates: Nominal Broad Dollar Index



The index – measuring dollar value against major international currencies – appreciated >12% in 2022 as interest rates increased



+12.3%

Relative dollar value increased from Jan 2022 low point to Oct 2022 high point

-6%

Relative dollar value decline from Nov 2022 to current levels, but remains above 5-Yr and 10-Yr average

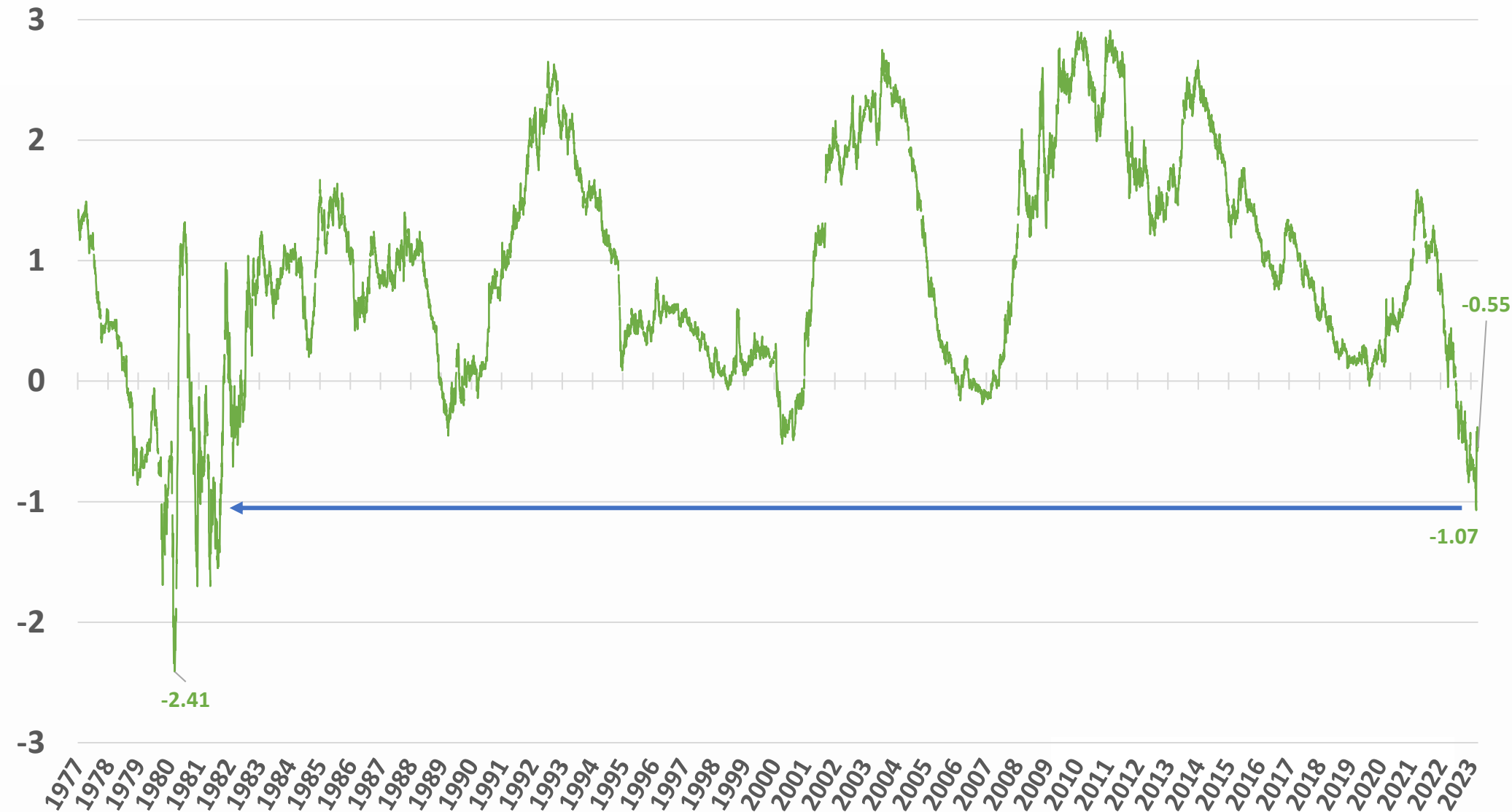
+9.9%

USDA real trade weighted exchange rate for corn increased 9.9% from 2021 to 2022

Recession Indicator: Treasury Yield Spread



The inversion between the 2-Yr and 10-Yr Treasury Note yields is a recession indicator



-1.07

The inversion first occurred in summer 2022, but hit -1.07 in early March – the widest inversion since 1981

-0.55

Since SVB failure, the inversion has narrowed, but still points to recession

8 Recessions

An inversion has accurately predicted the last 8 recessions

Crude Oil Prices



When OPEC+ announced oil production cuts in early April, prices jumped but have stayed between \$80-\$85/barrel after initial reaction



Prices were already trending up from the mid-March lows, but jumped quickly on the OPEC+ production cut announcement.

Prices have stayed in the \$80-\$85 per barrel range after initial reaction, a positive sign given rapid price increases would counter improving inflation.

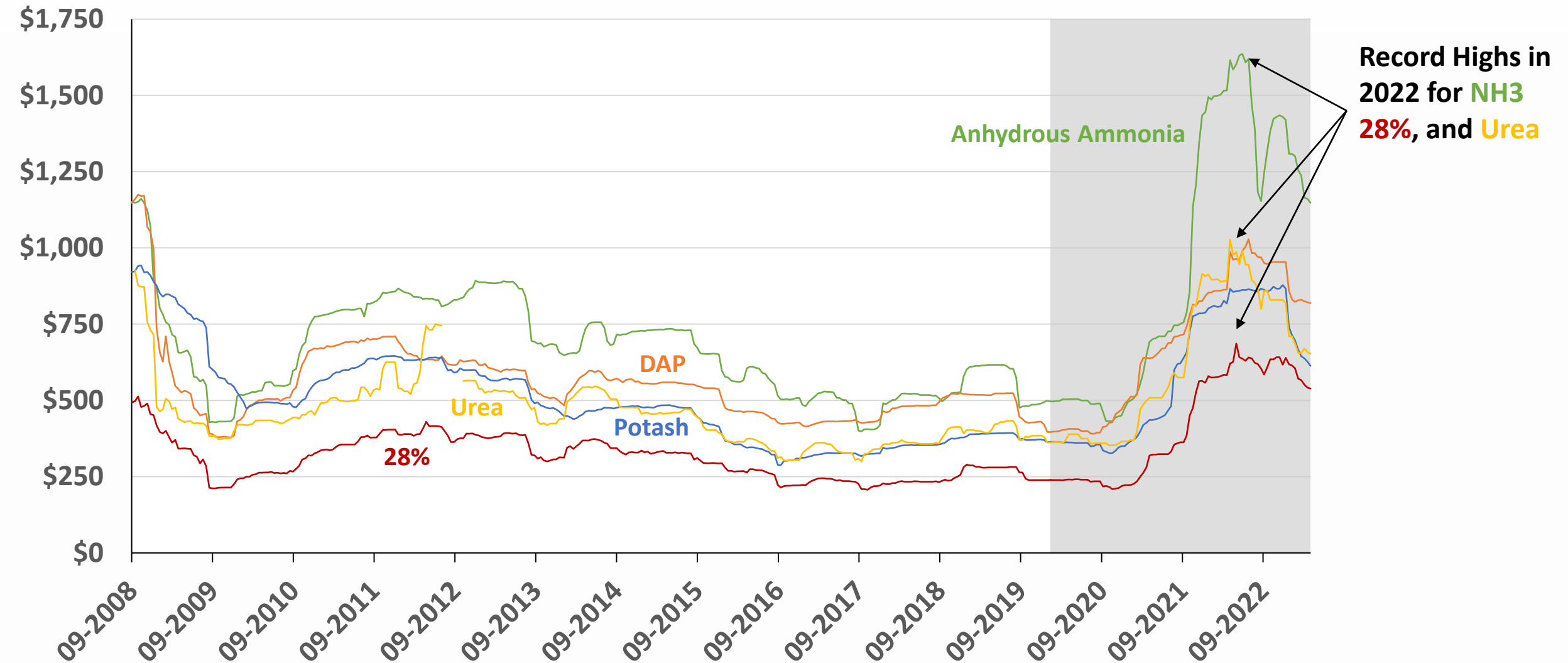
+17.5¢

EIA reports gasoline prices increased in the two-week period from March 27 to April 10

Farm Fertilizer Price Trends



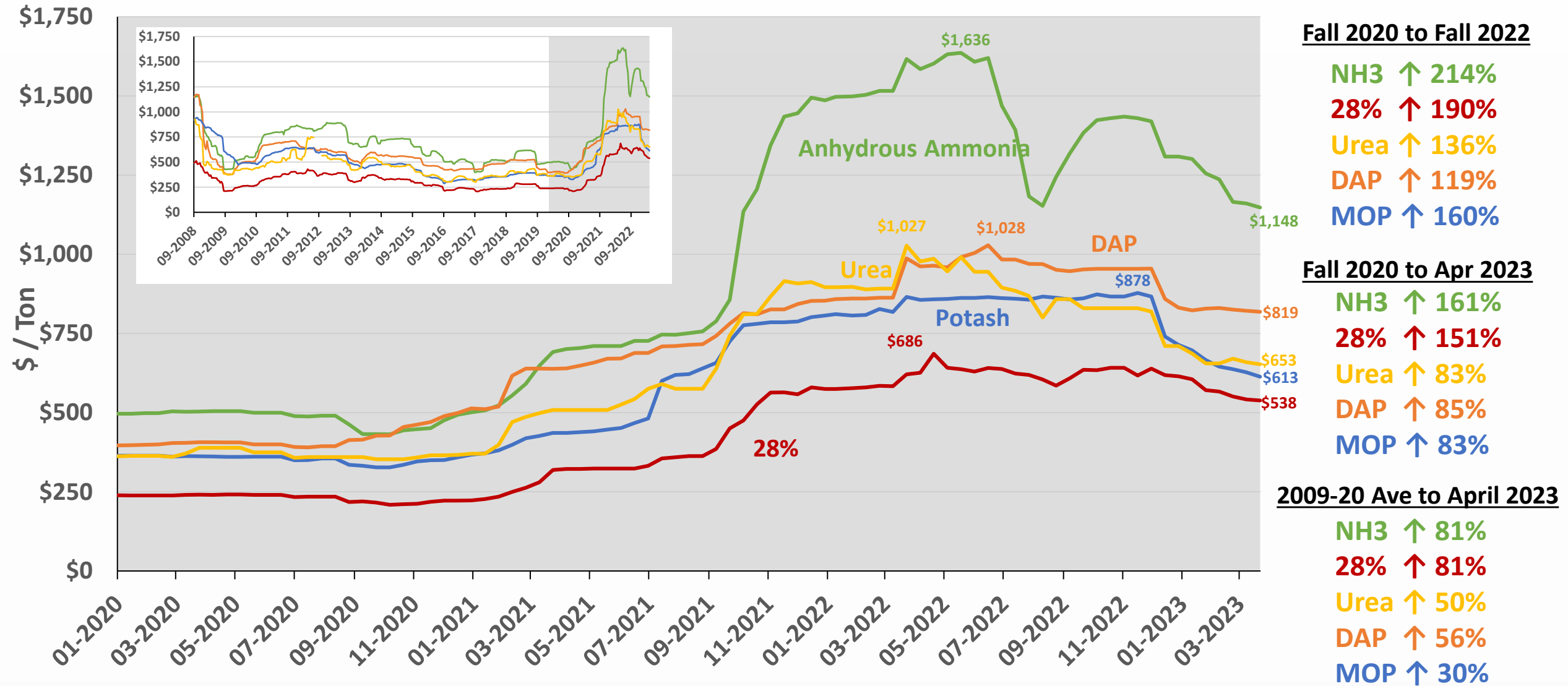
In 2022, N fertilizer prices surpassed previous 2008 highs, while increase in P & K fertilizer prices remained below 2008 highs



Farm Fertilizer Price Trends



Prices of N, P, and K more than doubled from Fall 2020 to Fall 2022, still elevated compared to Fall 2020 and longer-term average



USDA AMS Data Bi-Weekly Illinois Cost of Production Report, NCGA Calculations

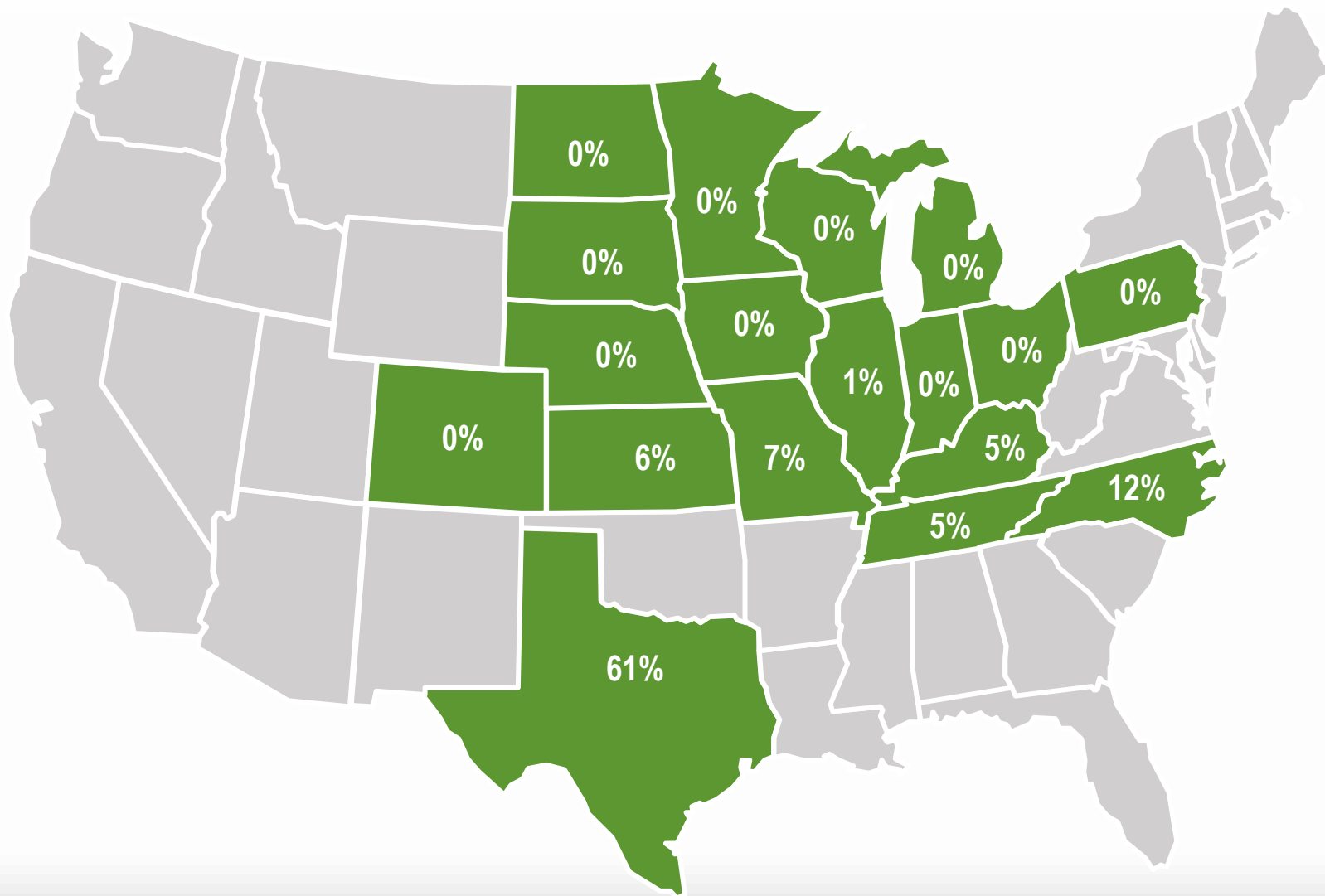
- Mexico GMO Corn Ban
- Chinese Corn Demand
- Brazil Corn Exports
- War in Ukraine



Farm Factors



Planting Progress & Weather



NATIONAL:

April 9, 2023: **3%**
April 9, 2022: **2%**
5-Year Average: **2%**

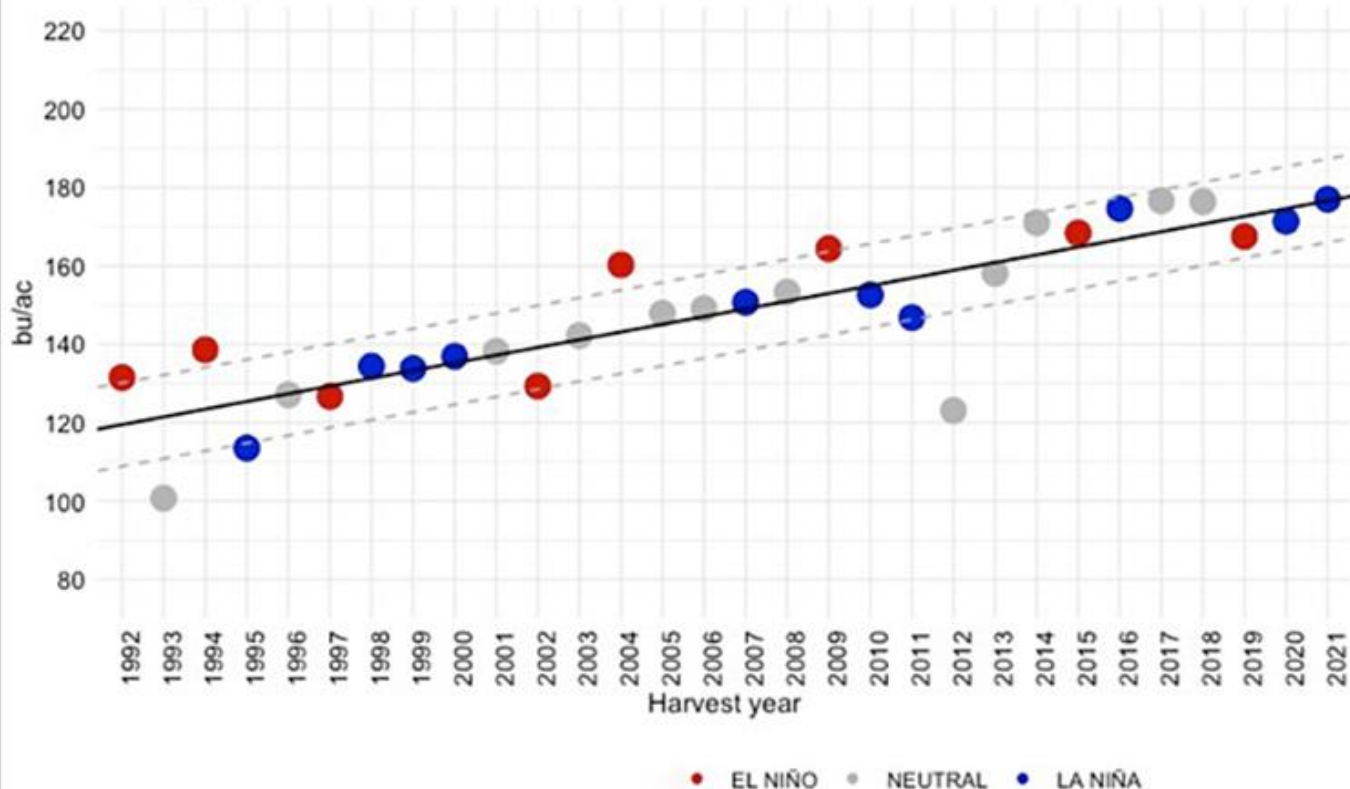
Note: These 18 states highlighted represent 92% of U.S. corn acreage in 2022.

Planting Progress & Weather



As atmospheric conditions are moving toward El Niño pattern, that has historically equated to strong U.S. corn yields

Figure 1. Corn Yields in the United States and El Niño/La Niña Episodes, 1993-2022



Note: The black line is the trendline for the period. The dashed gray lines are +/- one residual standard deviation from trendline.

Sources: USDA and NOAA

farmdocDAILY

Since 1992, above trend yields in >60% of El Niño years

When below trend, within 1 standard dev of trend

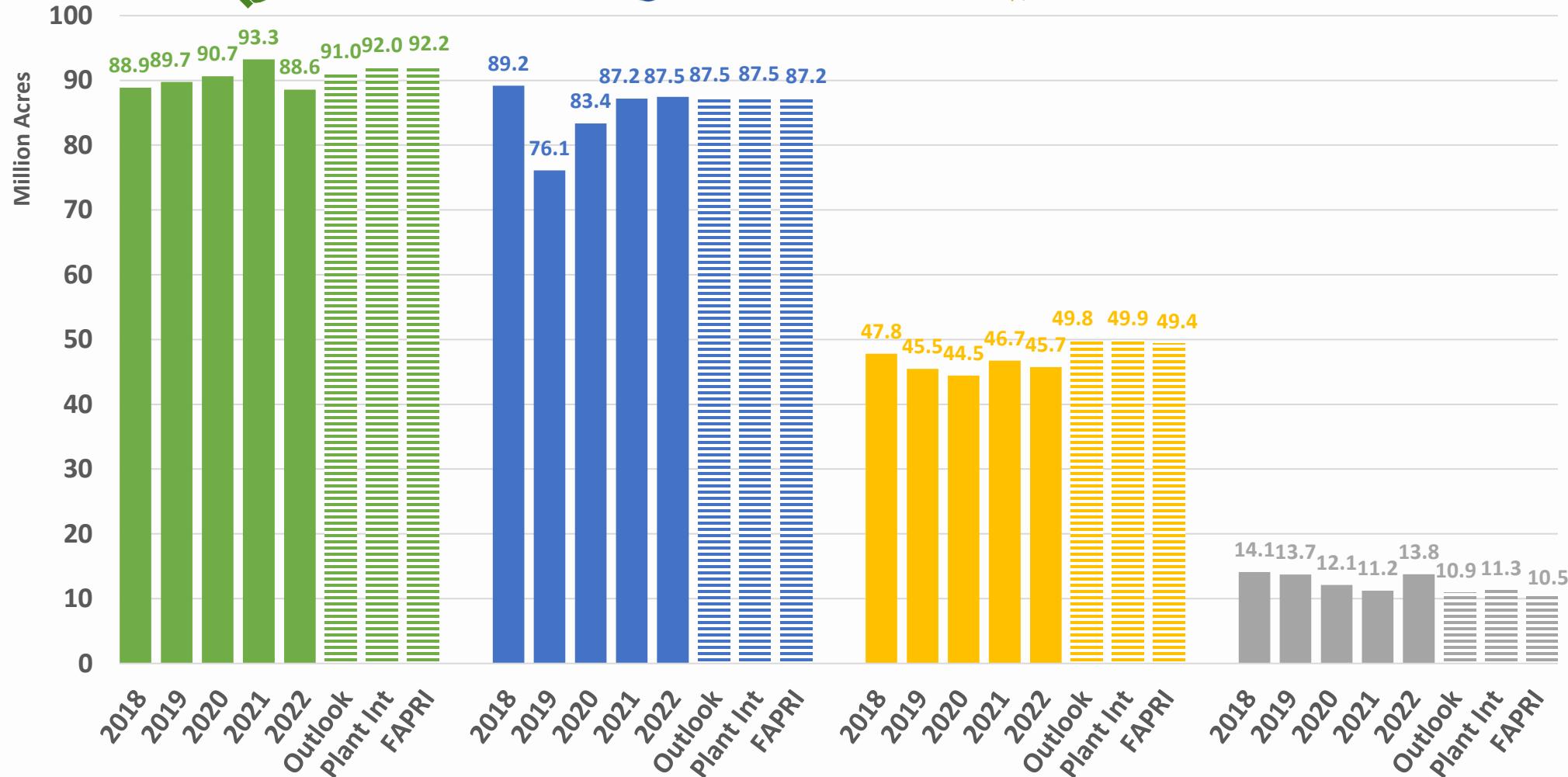
All four years with yields > 1 standard deviation above trend were El Niño years

USDA yield projection of 181.5 is achievable if conditions are right

U.S. Acreage Projections



Corn and wheat projected to add acres in 2023, while cotton drops acres, and soybeans remain the same as 2022



Comparisons below to March USDA Prospective Plantings, USDA Feb Outlook Figures and FAPRI projections shown in graph

+3.9%

↑ 2.4M Corn Acres

2022: 88.6M

2023: 92.2M

+0.06%

↑ 0.06M Soybean Acres

2022: 87.45M

2023: 87.51M

+9.0%

↑ 4.1M Wheat Acres

2022: 45.7M

2023: 49.9M

-18.2%

↓ 2.5M Cotton Acres

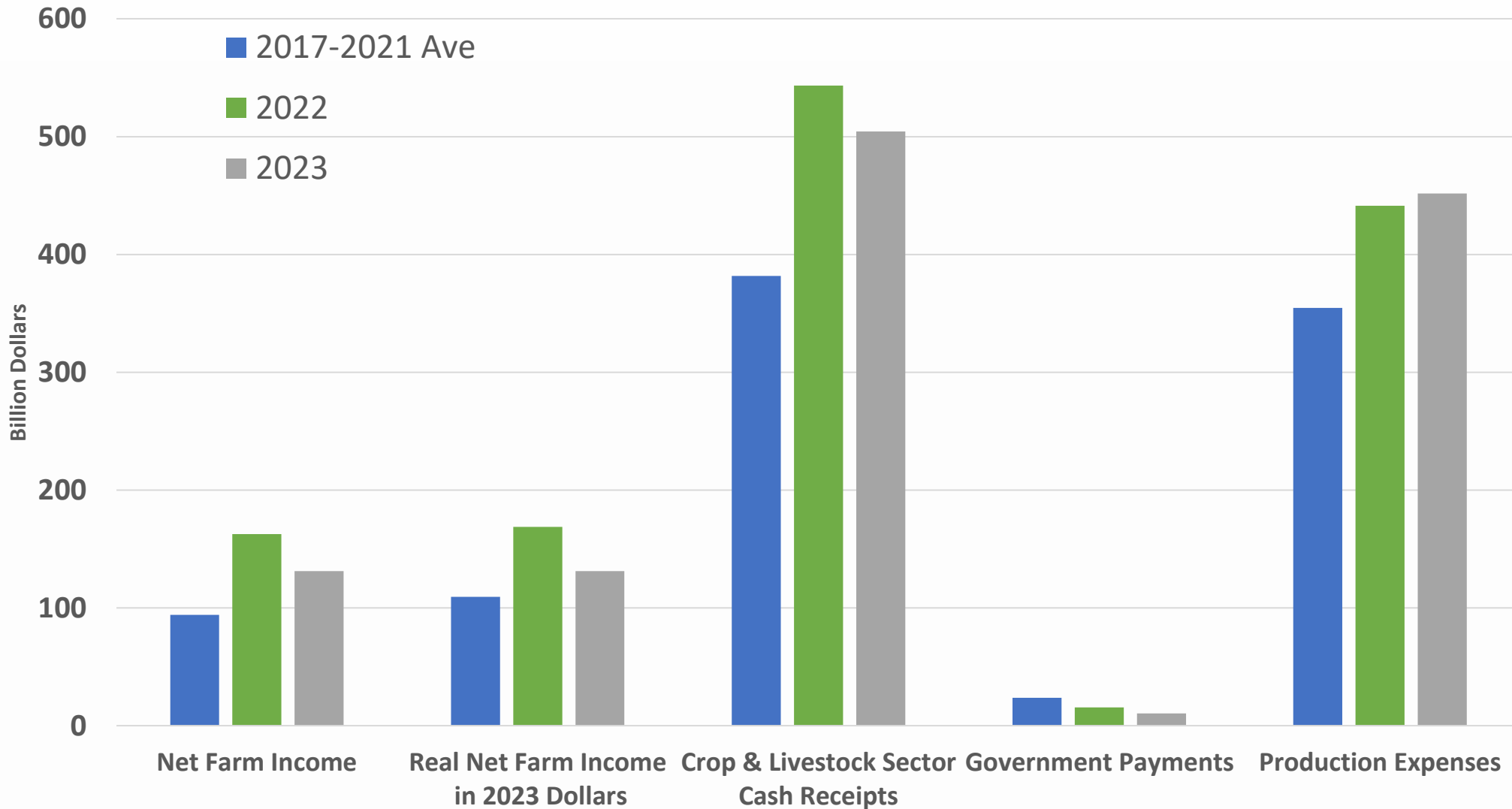
2022: 13.8M

2023: 11.3M

U.S. Farm Income Projections



2023 Net Farm Income projected 19.3% lower than 2022, but higher than the previous five-year average



-19.3%

Net Farm Income
↓ \$31.4 B from 2022

-22.2%

Real Net Farm Income
↓ \$37.4 B from 2022

-7.2%

Crop & Livestock Receipts
↓ \$38.9 B from 2022

-33.3%

Government Payments
↓ \$5.2 B from 2022

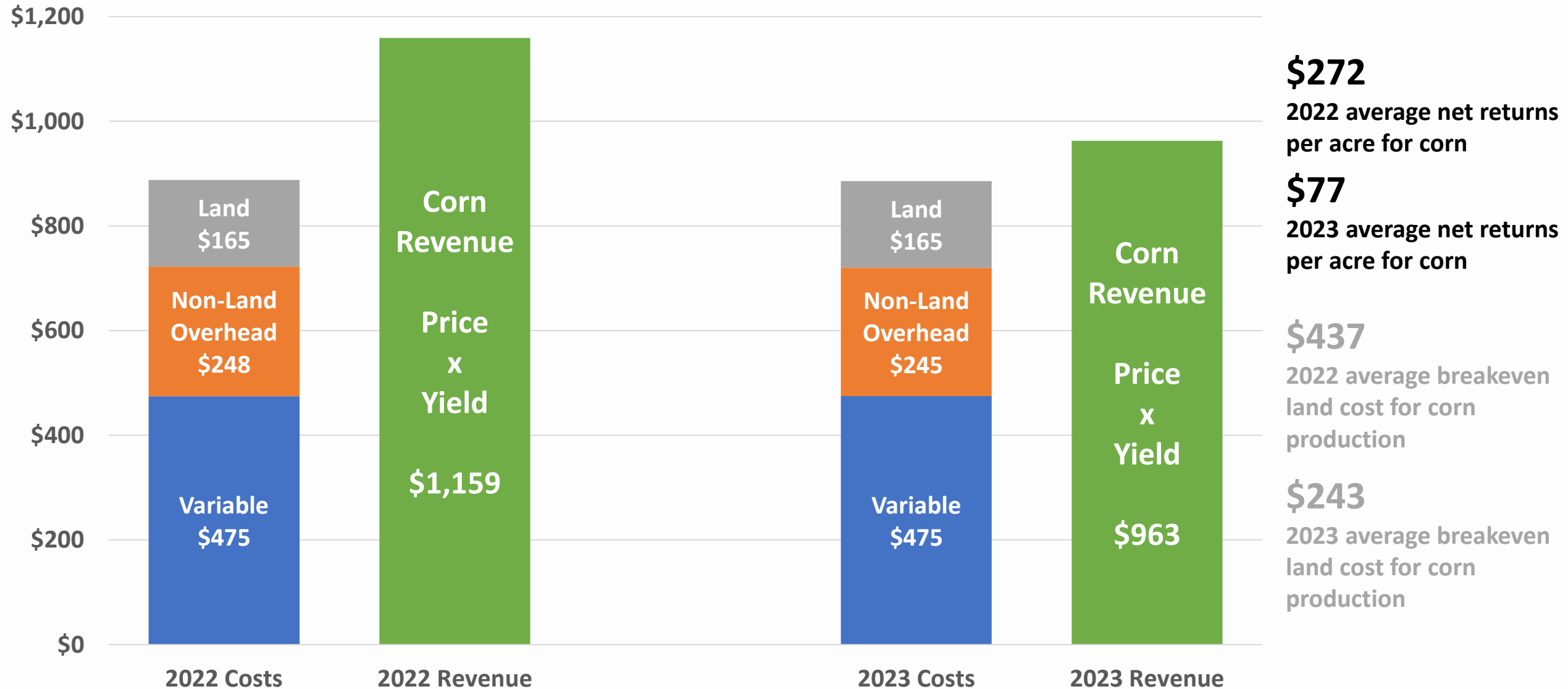
+2.4%

Production Expenses
↑ \$10.4 B from 2022

U.S. Corn Costs & Returns



Average 2023 corn production costs nearly equal to 2022, but revenue considerably lower resulting in tighter margins



Data Source: FAPRI, USDA, NCGA Calculations



Krista Swanson
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