



# Food & Agricultural Policy Research Institute

University of Missouri

Celebrating 40 years of FAPRI



1984 - 2024

## Crop, livestock and farm income outlook

Bob Maltsbarger

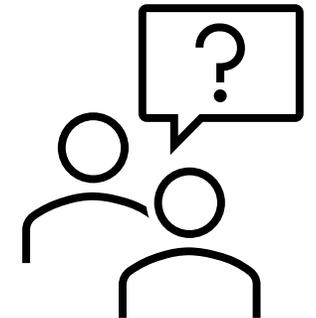
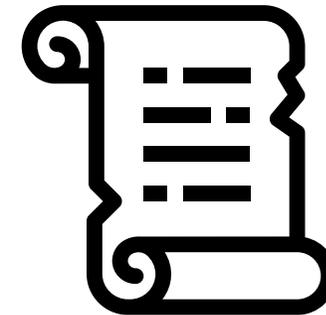
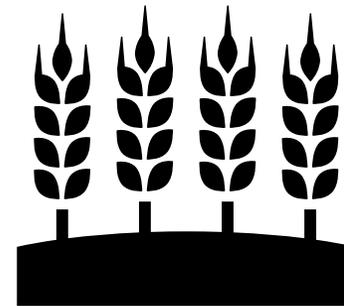
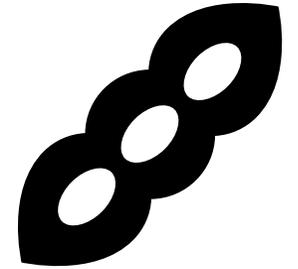
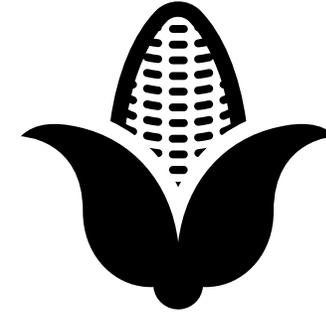
([robert.maltsbarger@missouri.edu](mailto:robert.maltsbarger@missouri.edu))

Farm Credit East

April 9, 2024

# Agenda

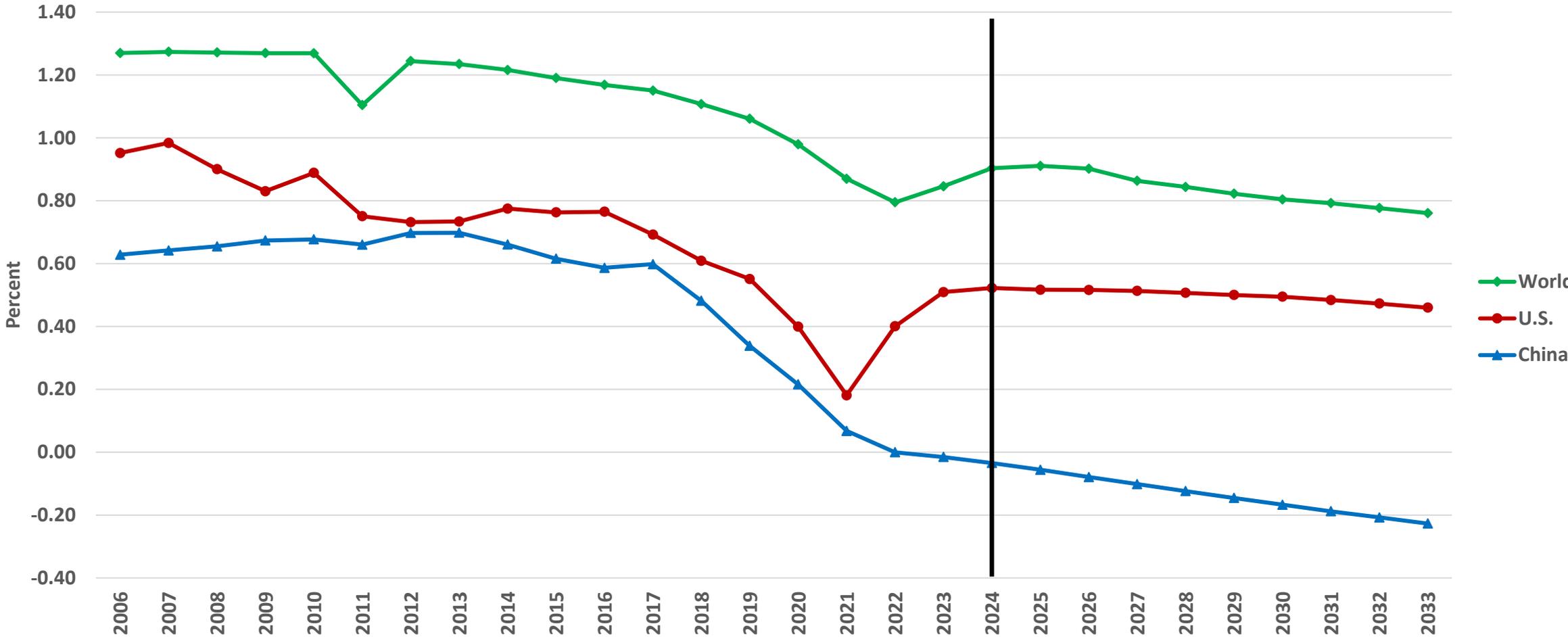
- Some macroeconomic highlights
- Market outlook
  - Corn
  - Soybeans
  - Wheat
  - Cattle
  - Dairy
  - Farm income
- A few words about the farm bill
- Your questions



# U.S. and world economic growth

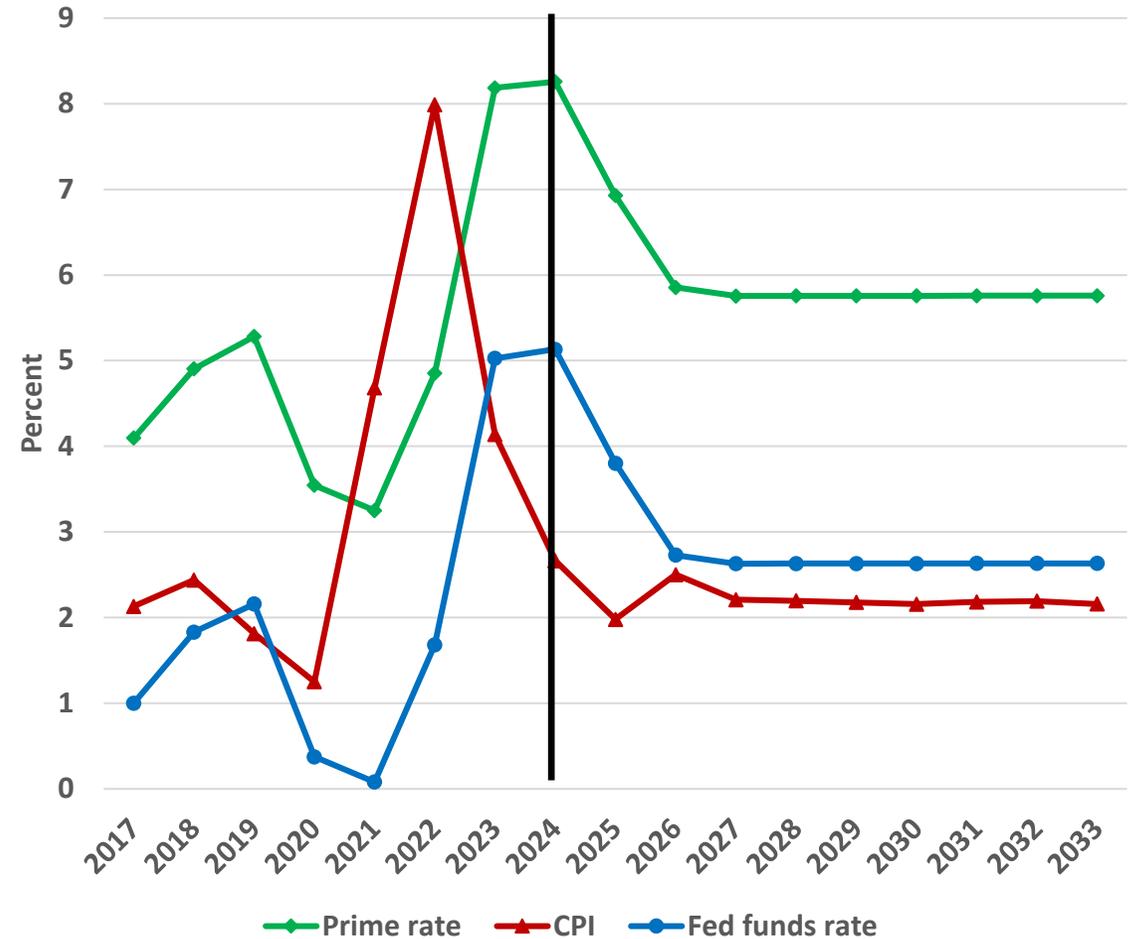


# U.S., China and world population growth rates



# U.S. interest and inflation rates

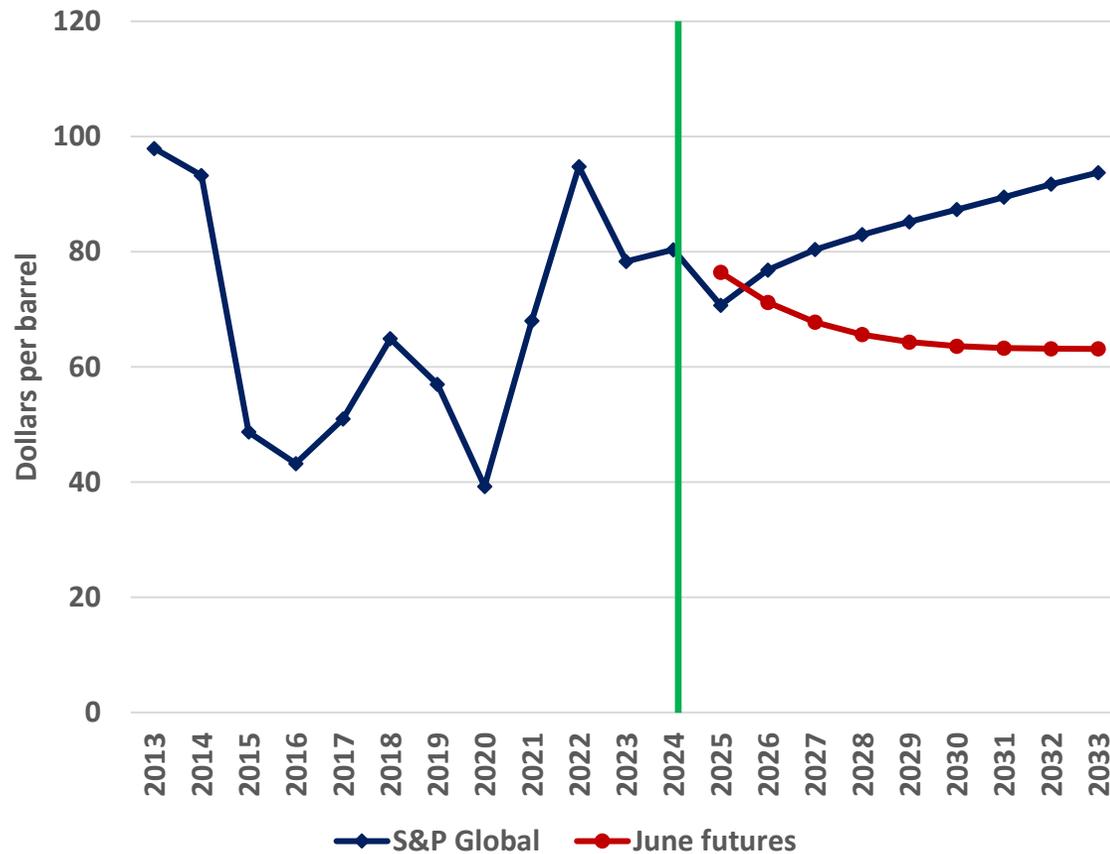
- U.S. inflation spiked to average 8% in 2022
  - Fed has higher interest rates; S&P projects fed funds to reach 5.35% in Q1 2024
    - Softens q/q down to stabilize at 2.75% Q3 2026
- S&P projects inflation to continue to decline to average 2.4% in 2024, then to hover near 2.2% through 2033



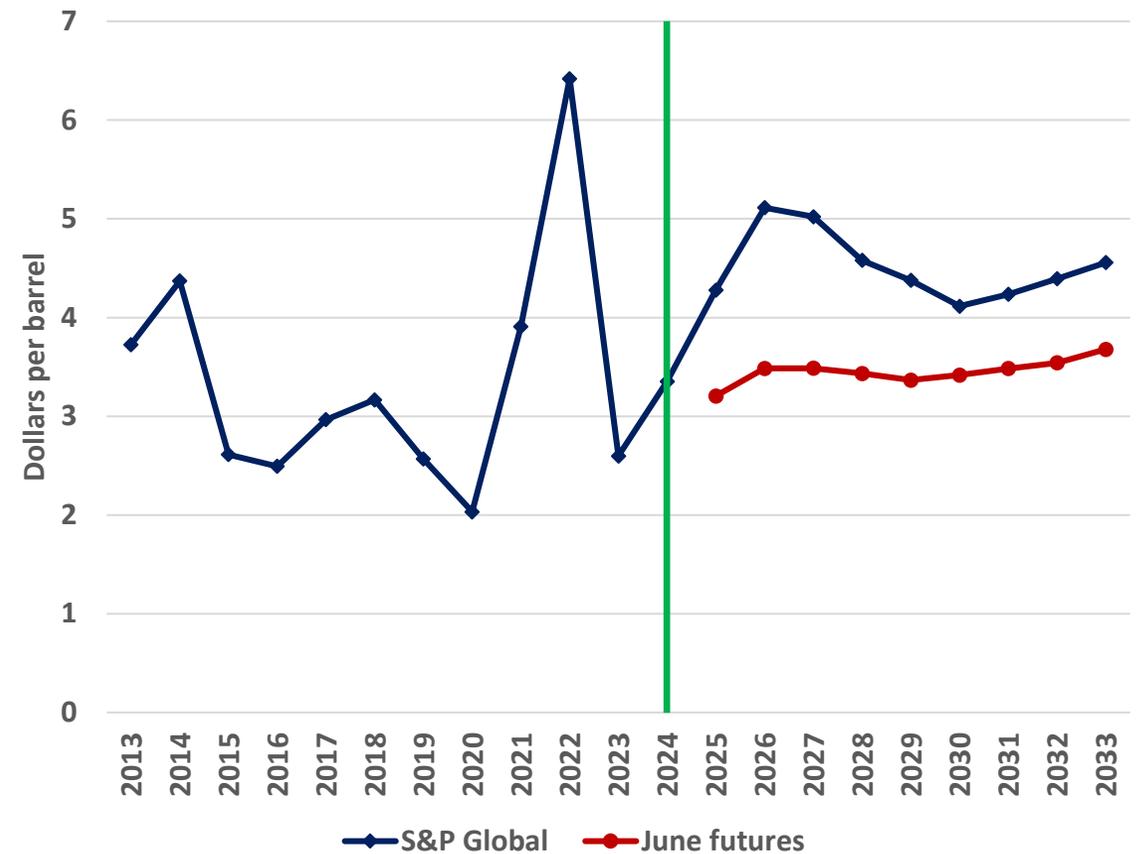
Source: S&P Global, Dec. 2023

# U.S. oil and natural gas prices

## West TX intermediate crude oil



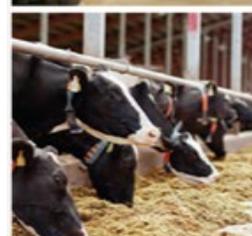
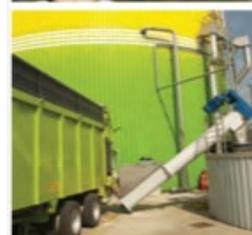
## Natural gas, Henry Hub



Source: S&P Global, Dec. 2023; June futures contracts, as reported by CME on April 5, 2024

# The market outlook

- The next several slides take information from several sources:
  - USDA's February Ag Outlook Forum
  - USDA's PSD February estimates
  - USDA's March Planting Intentions
  - FAPRI's 2024 baseline released March
  - Futures markets
  - S&P Global – December 2023



Celebrating 40 years of FAPRI



1984 - 2024

## U.S. Agricultural Market Outlook

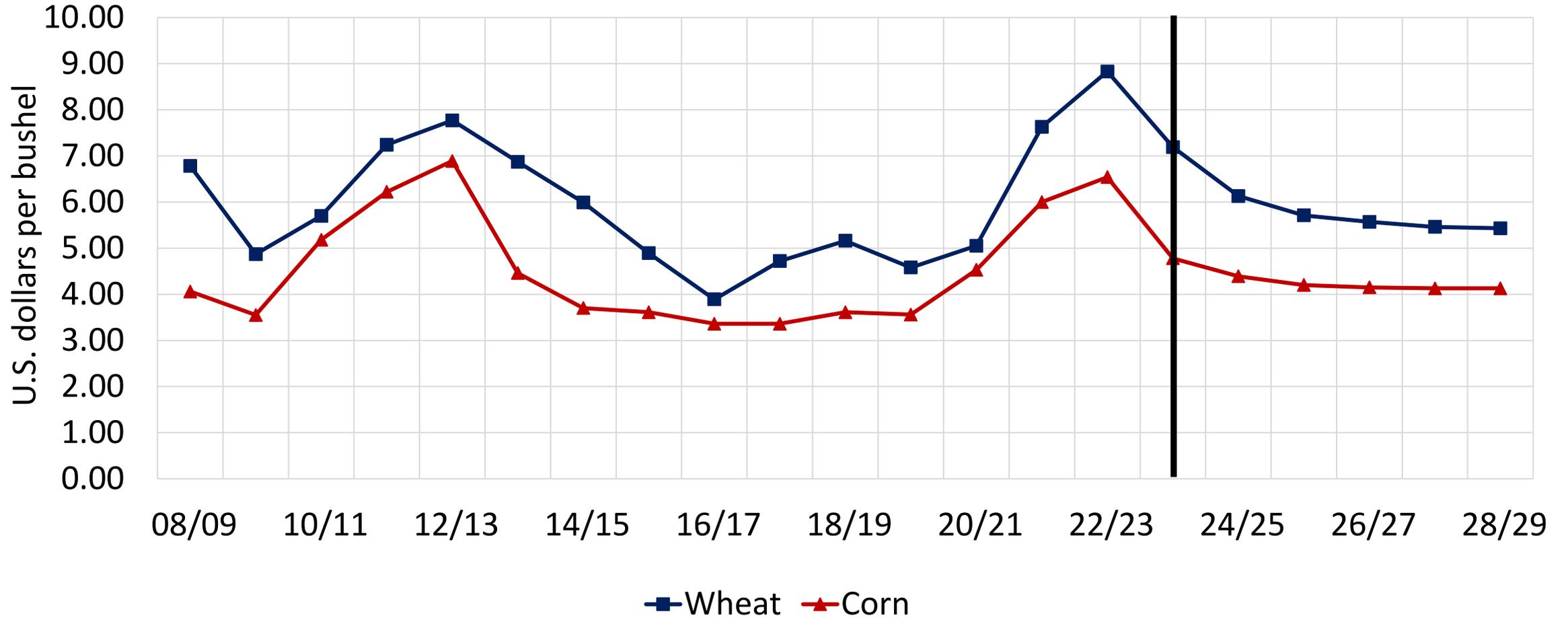
March 2024

FAPRI-MU Report #01-24



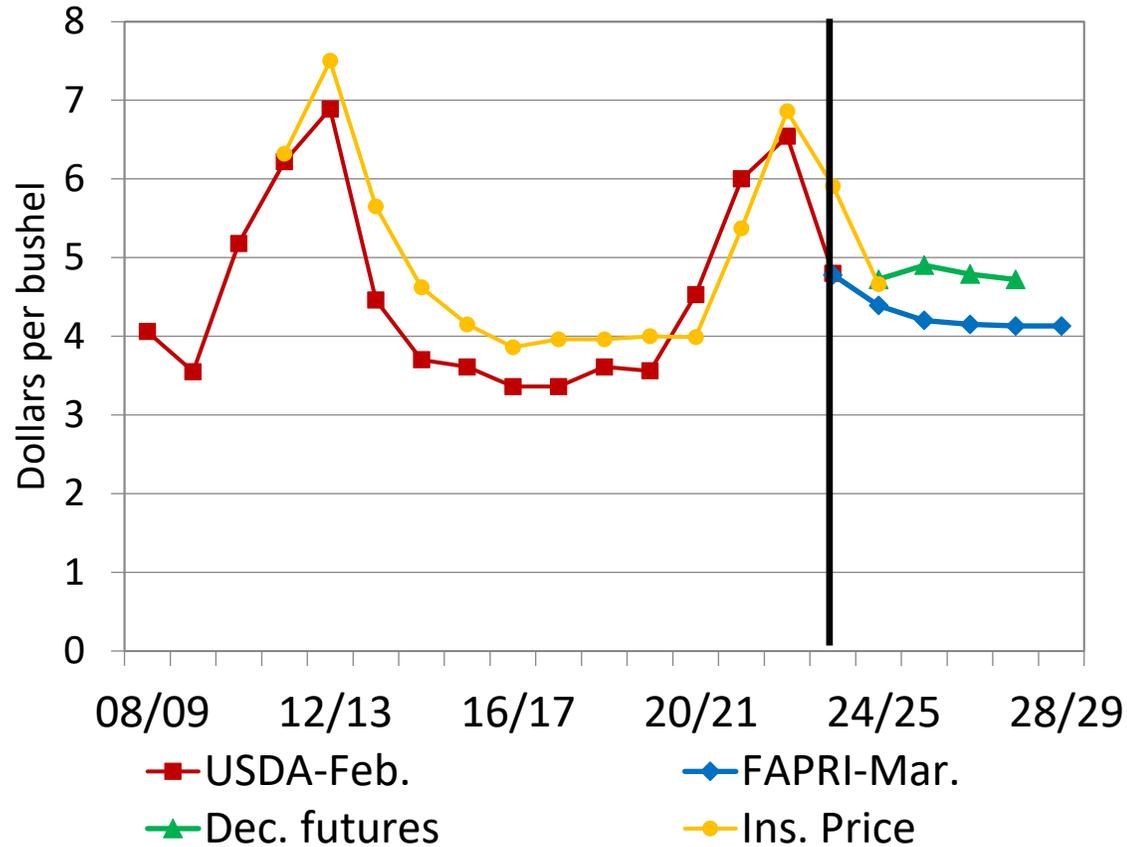
Food & Agricultural  
Policy Research Institute  
University of Missouri

# U.S. corn and wheat prices

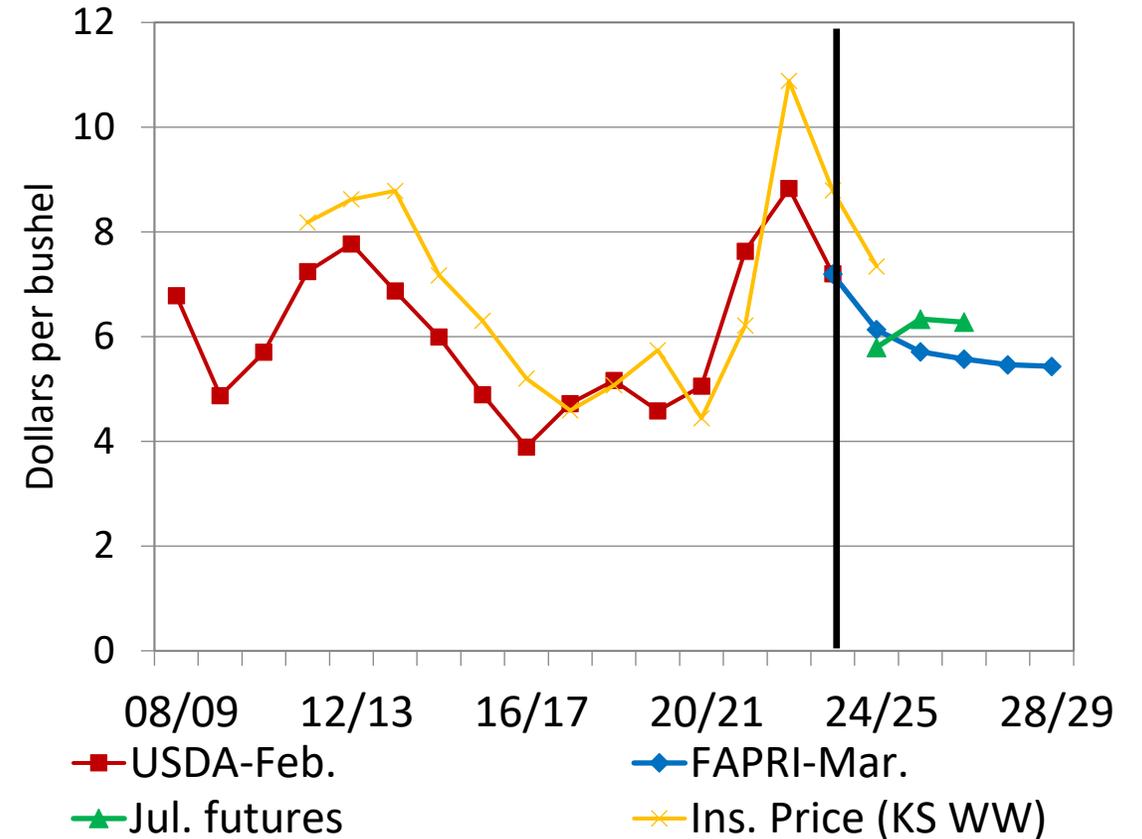


# U.S. corn and wheat prices

## U.S. corn prices

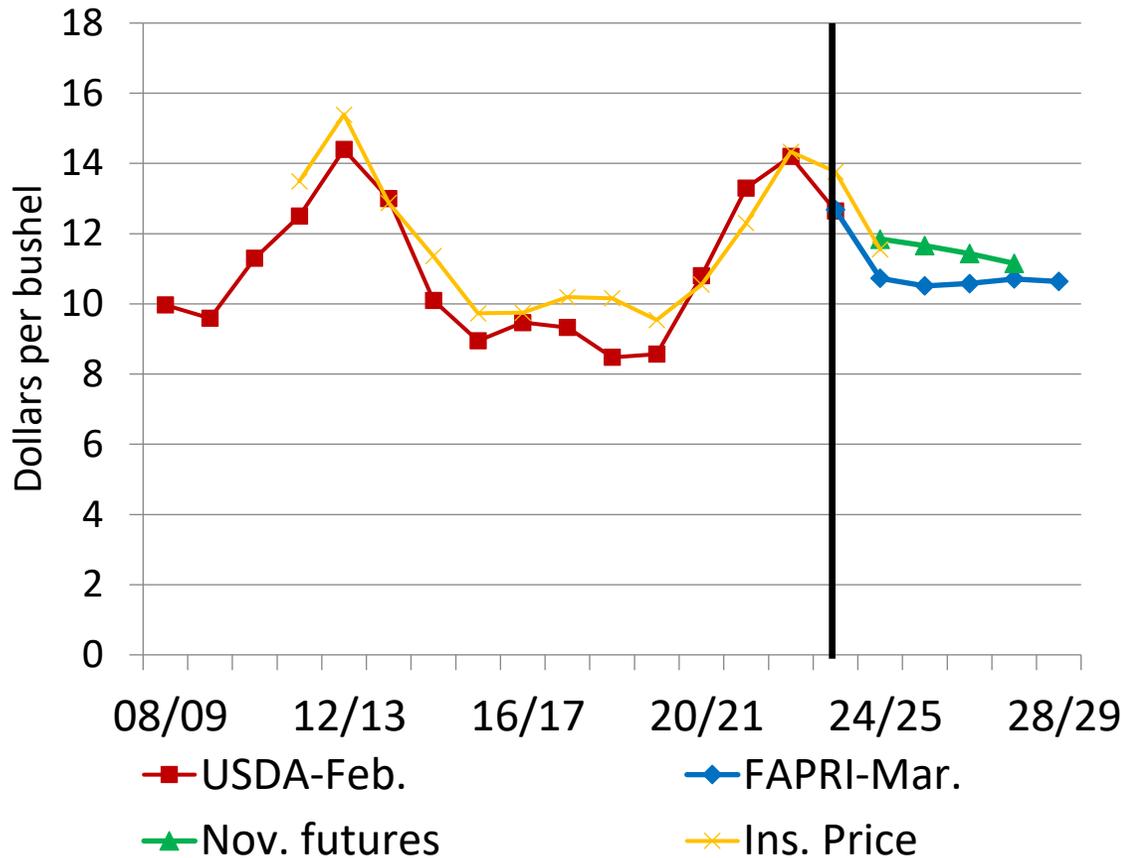


## U.S. wheat prices

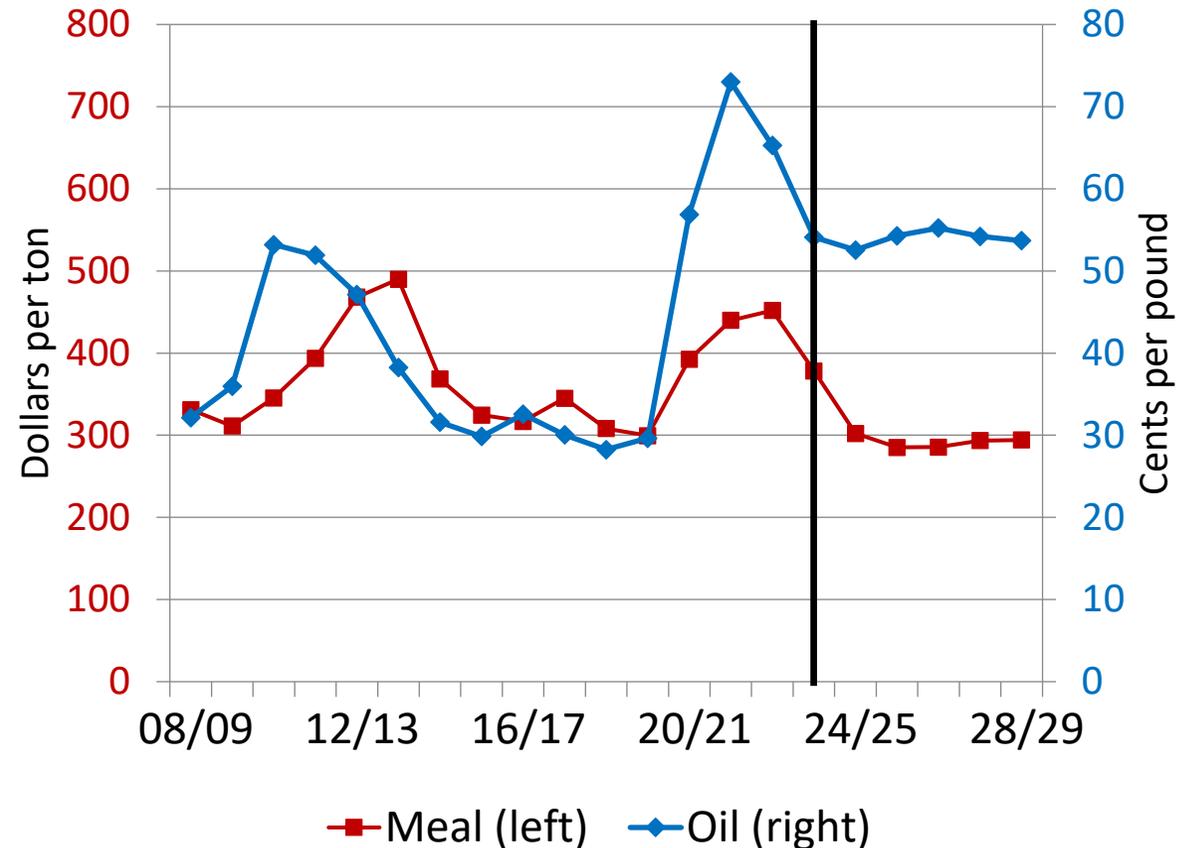


# U.S. soybean and soybean product prices

## U.S. soybean prices



## U.S. soybean product prices



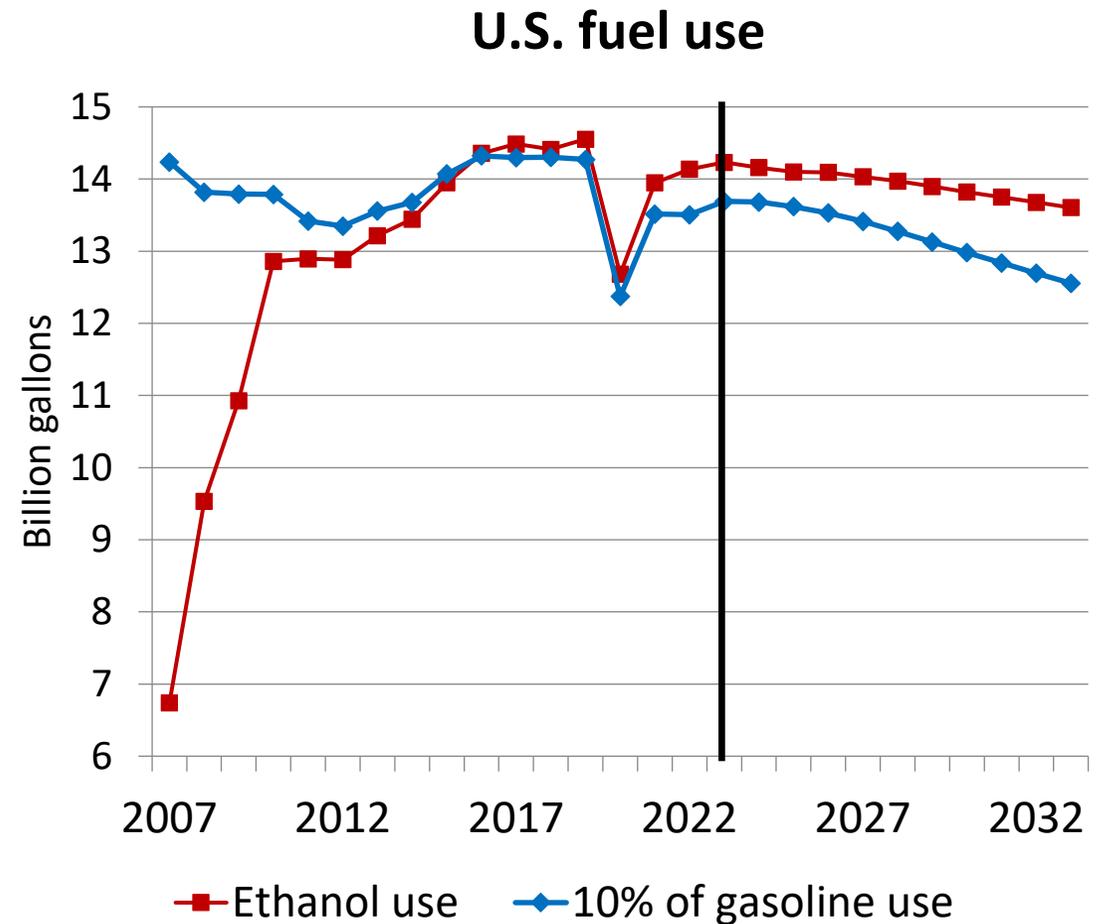
# Corn outlook

- Demand
  - Domestic demand: no big shifts
  - Exports: lots of wild cards
- Supply
  - Production costs high, but fertilizer prices have declined from 2022 peaks
  - Likely to see shift to soybeans
  - Will yields continue to another record?
- Prices depend on balance



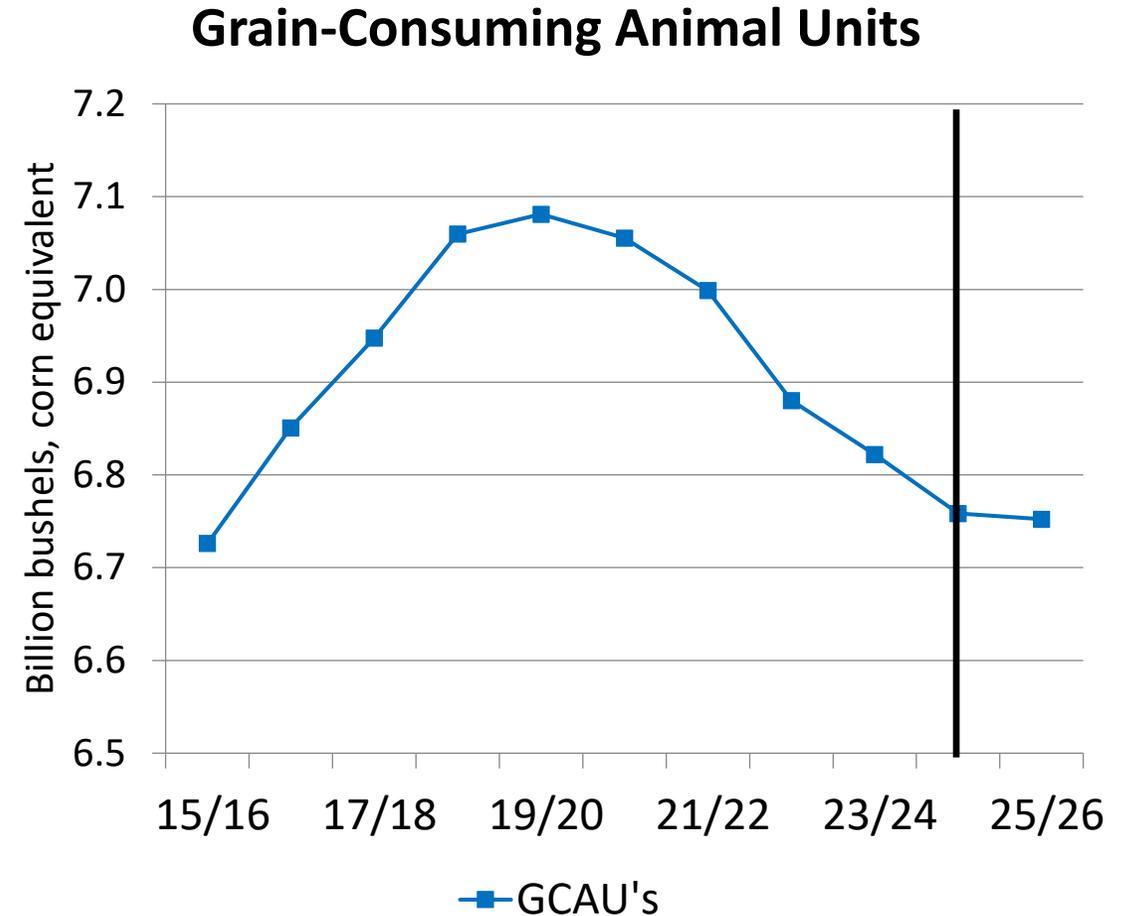
# Domestic gasoline and ethanol use

- Since 2010, almost all gasoline sold in U.S. is a 10% ethanol blend
- Gasoline use dropped in 2020 with pandemic, only partially recovered
- Could slide in the future with adoption of electric vehicles & efficiency
- Thus, will require some higher-level blends just to hold current ethanol use levels



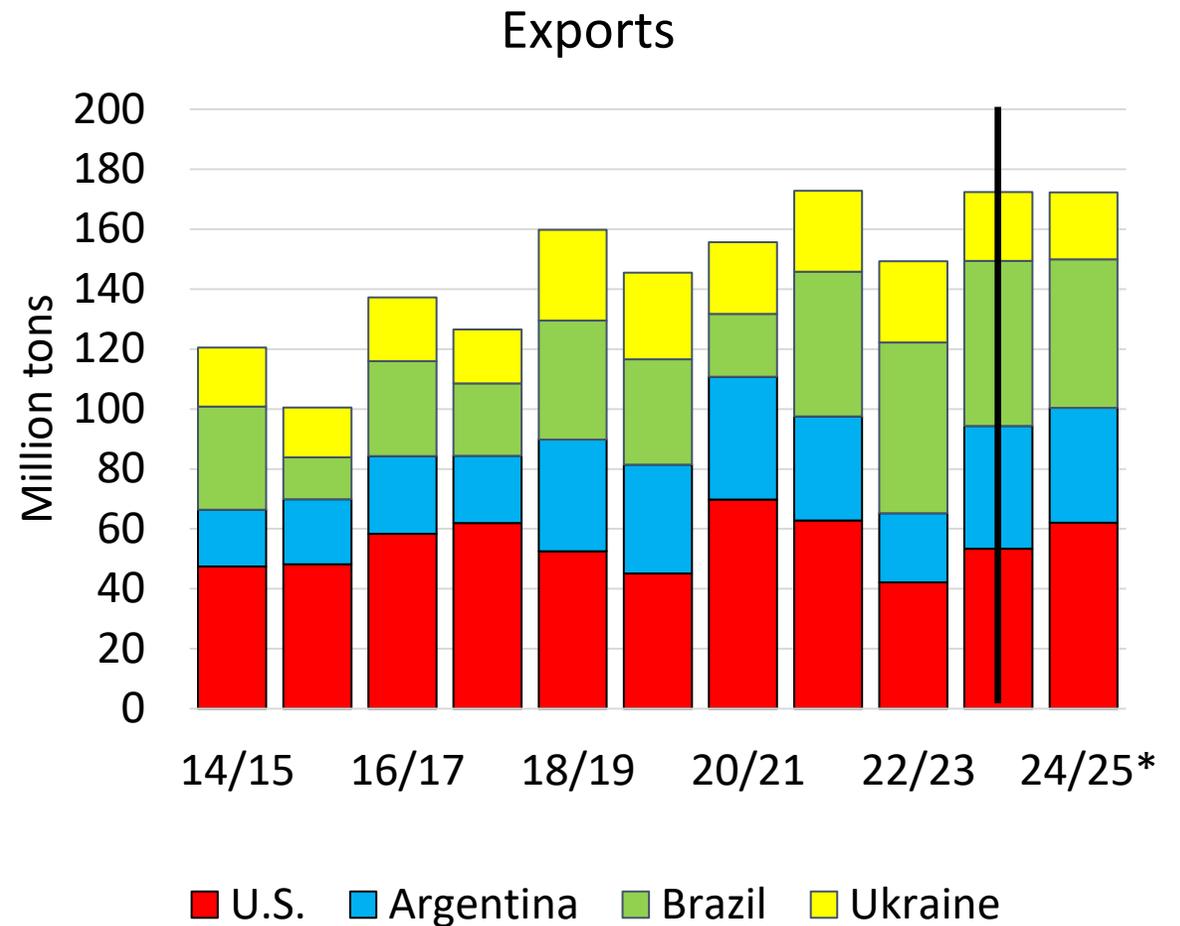
# Corn feed and residual use

- Our measure of GCAU's:
  - Reflects production of meat, milk and trends in feed efficiency, ration shares
  - Has declined recently, largely due to lower cattle numbers
  - Projected to flatten from 24/25 to 25/26
- Corn feed use also depends on prices/availability of feedstuffs
- Residual can be large, reflecting any errors in estimating supply or other demand categories



# Corn exports

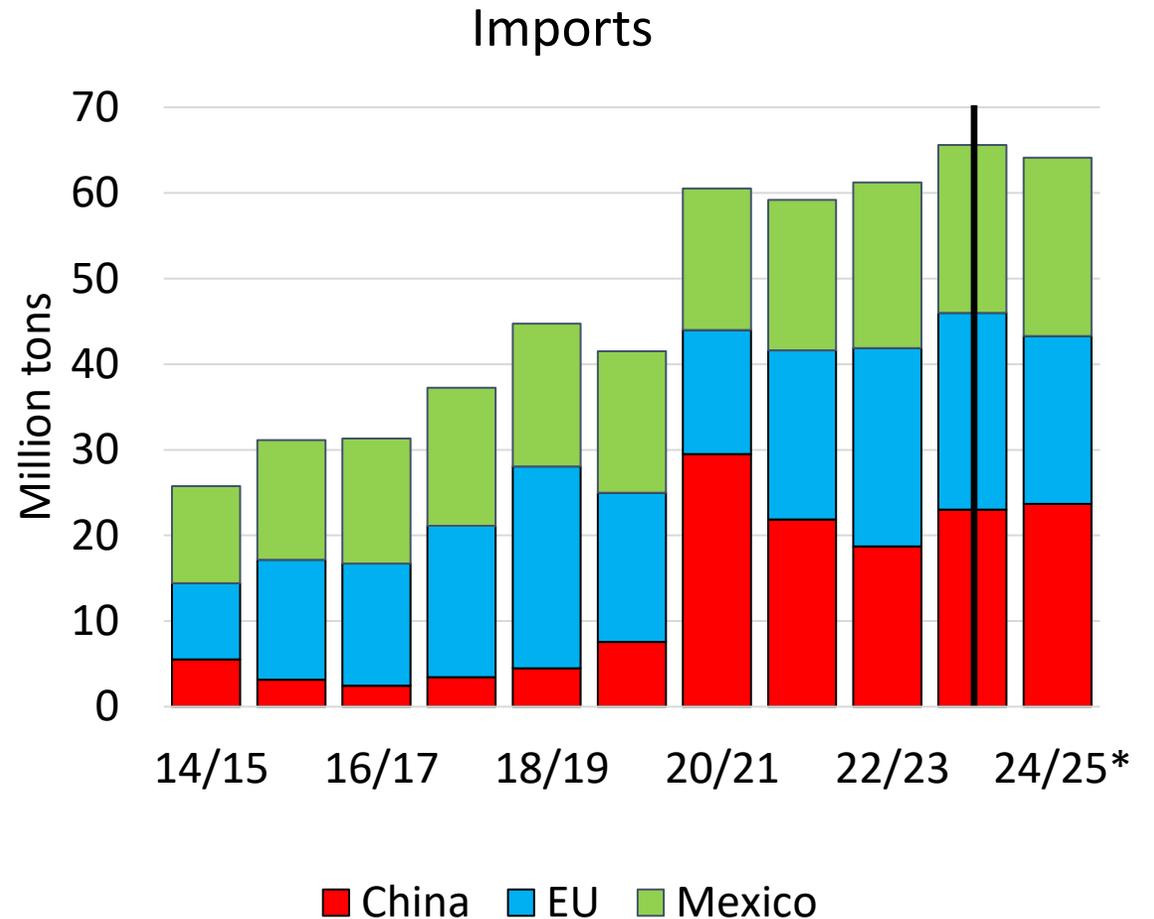
- Prices affected strongly by weather (and more) in major exporters
  - Brazil—small crop in 20/21; large crop in 22/23
  - Argentina—small crop in 22/23, may grow nearly 20 mmt year-on-year
  - Ukraine exports limited by war (but not as much as initially feared)
  - U.S. exports limited by supplies in 22/23
  - How will el Niño affect 2<sup>nd</sup> crop corn in Brazil?
  - If “normal” crops in 2024, could see larger exports, lower prices



Sources: 2014/15-2023/24 from USDA PSD, Feb. 2024;  
\*2024/25 from FAPRI, Mar. 2024

# Corn imports

- A lot more importers than major exporters
- 3 major importers account for much of corn trade increase
  - China: big jump in imports in 20/21; major wild card (post trade war)
  - EU: imports vary with domestic production, policy choices
  - Mexico: GMO rules could affect future trade with U.S., others

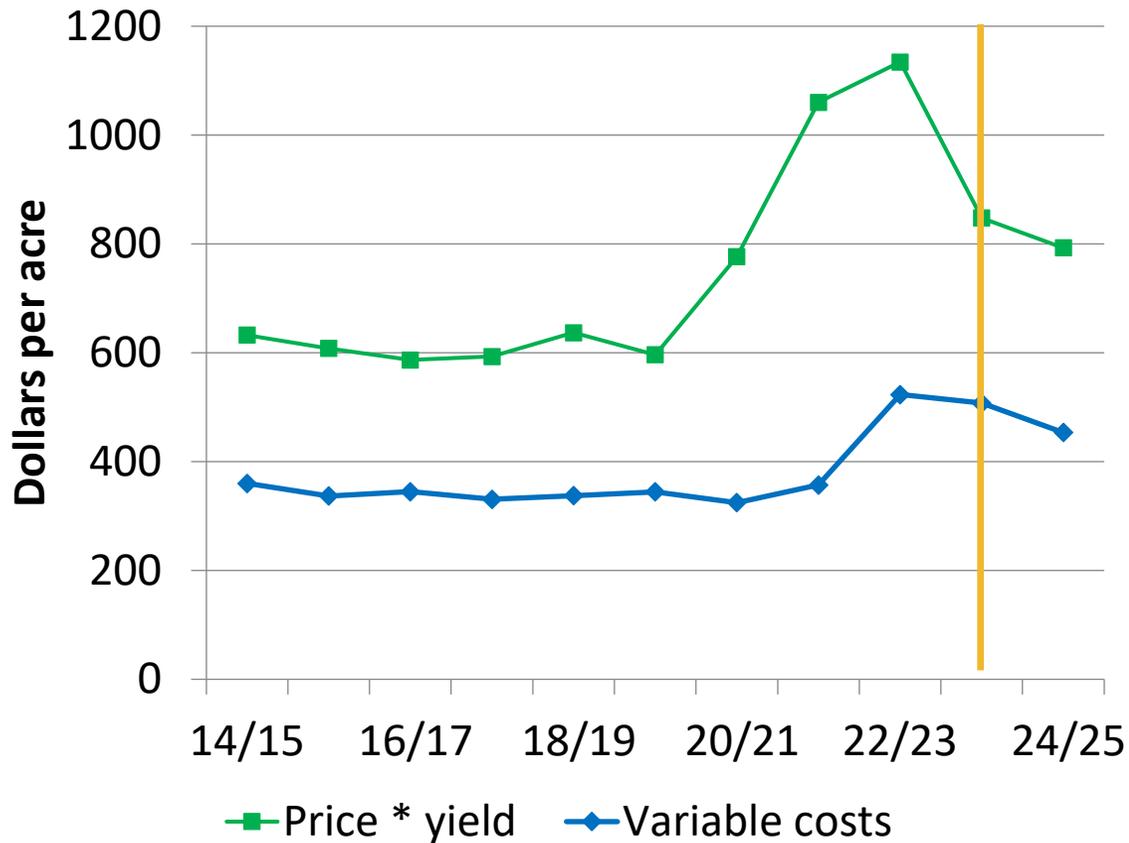


Sources: 2014/15-2023/24 from USDA PSD, Feb. 2024;  
\*2024/25 from FAPRI, Mar. 2024

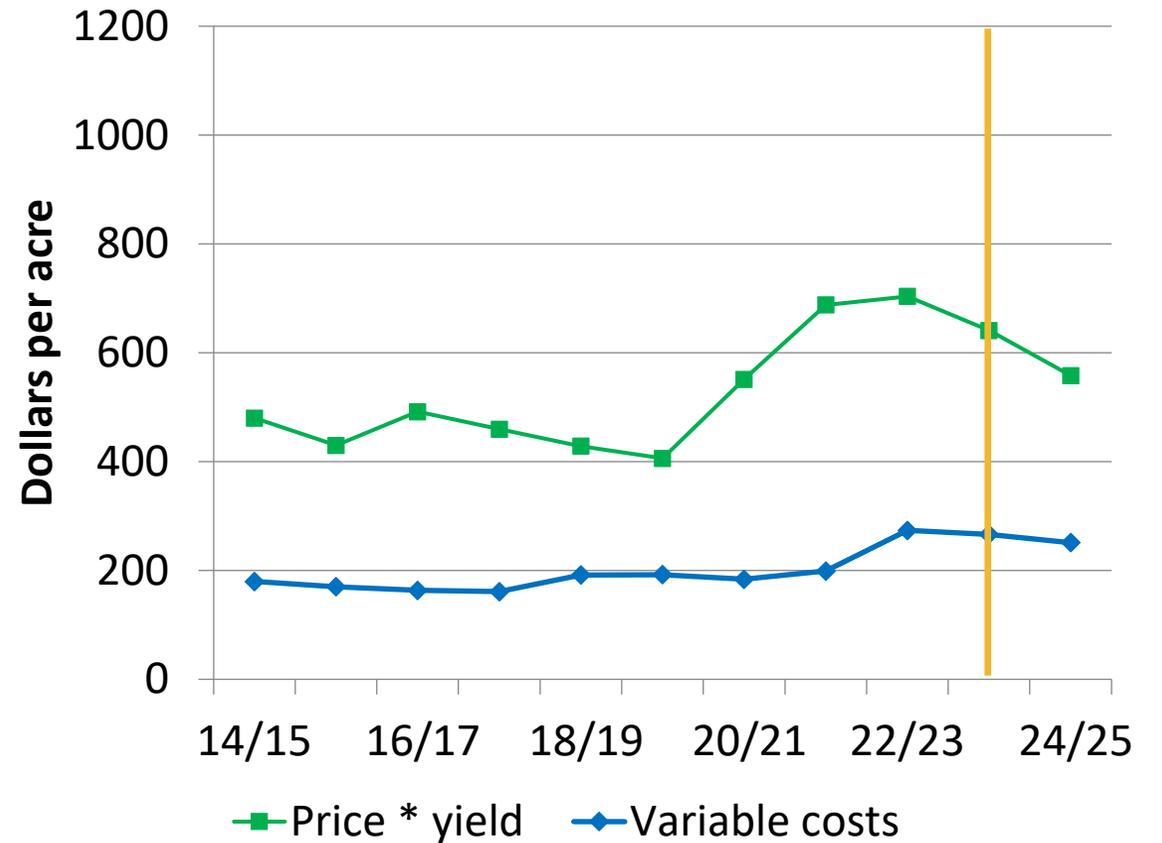
# U.S. crop market returns and variable costs

Variable costs are defined as operating costs for fertilizer, seed, chemicals, etc. plus hired labor, but ...  
...exclude land, depreciation and other fixed costs.

## Corn



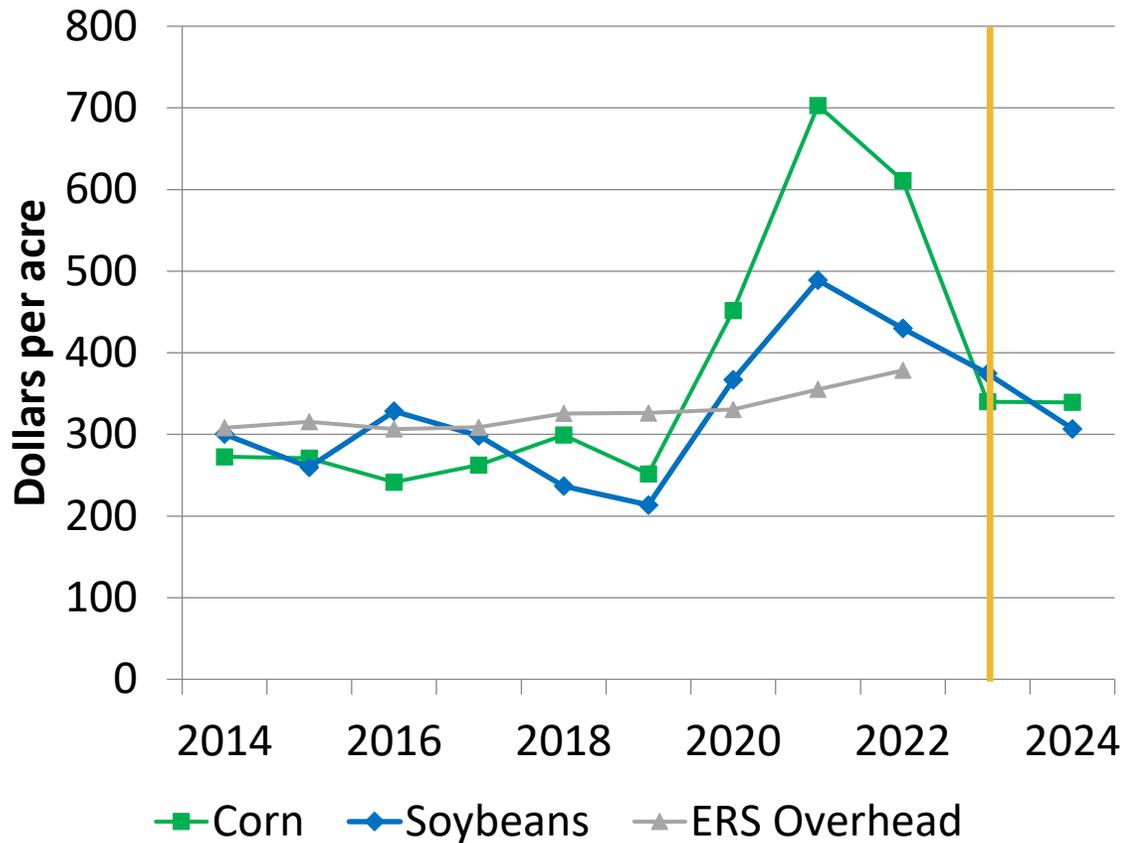
## Soybeans



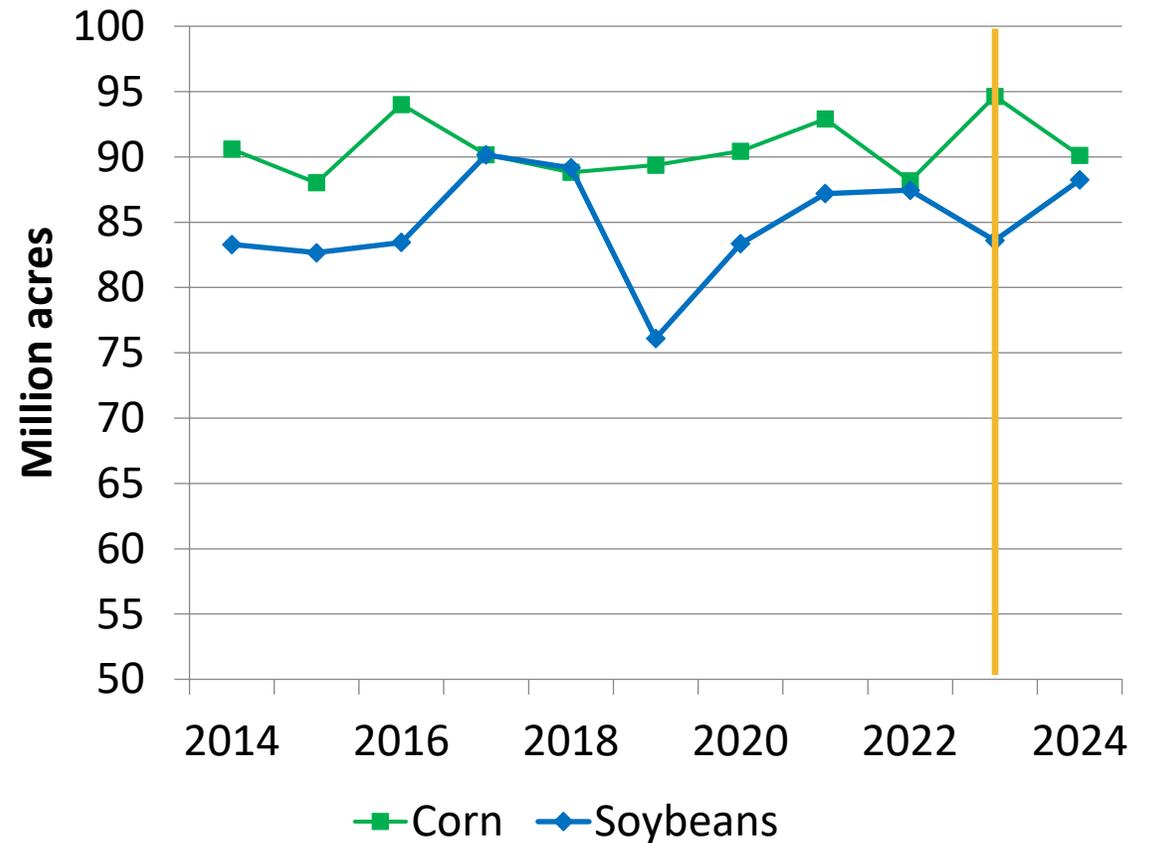
# U.S. crop net returns and planted area

Market net returns are defined as price times yield minus variable production costs, as indicated in the previous chart. Overhead is labor, machinery/equip., land, taxes, insurance, and general overhead. Some are economic costs.

## Market net returns



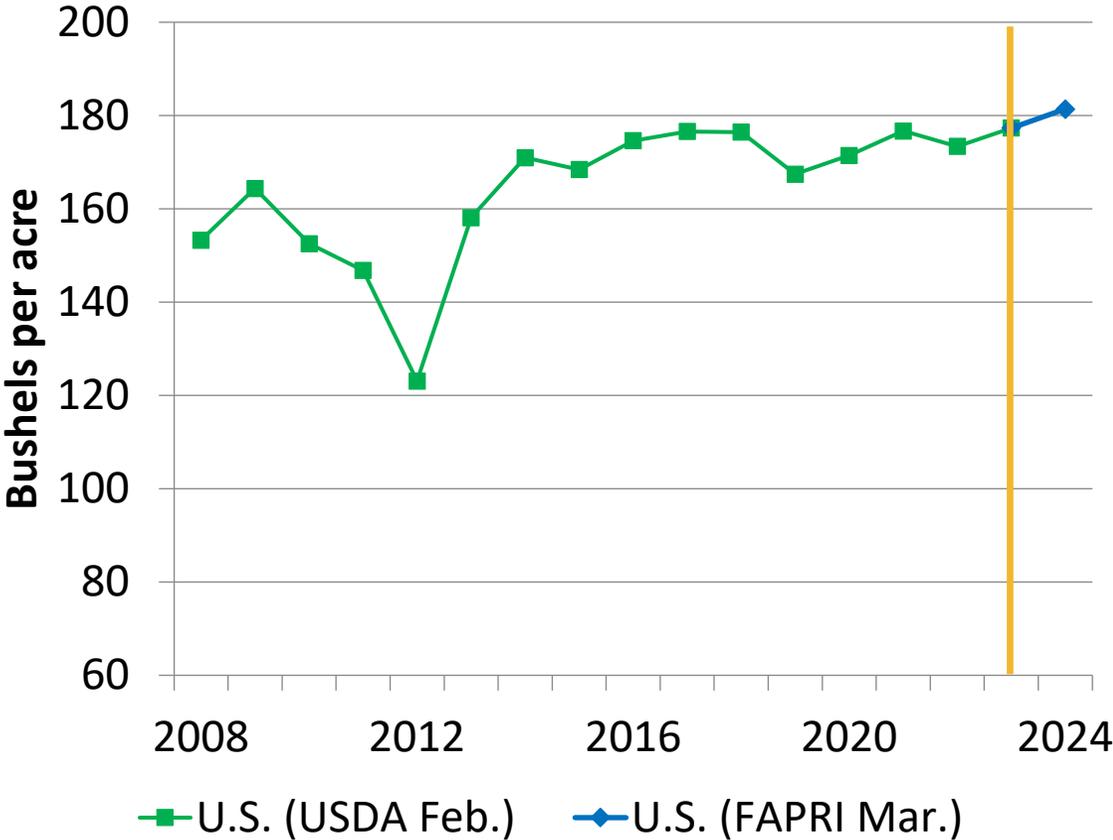
## Planted area



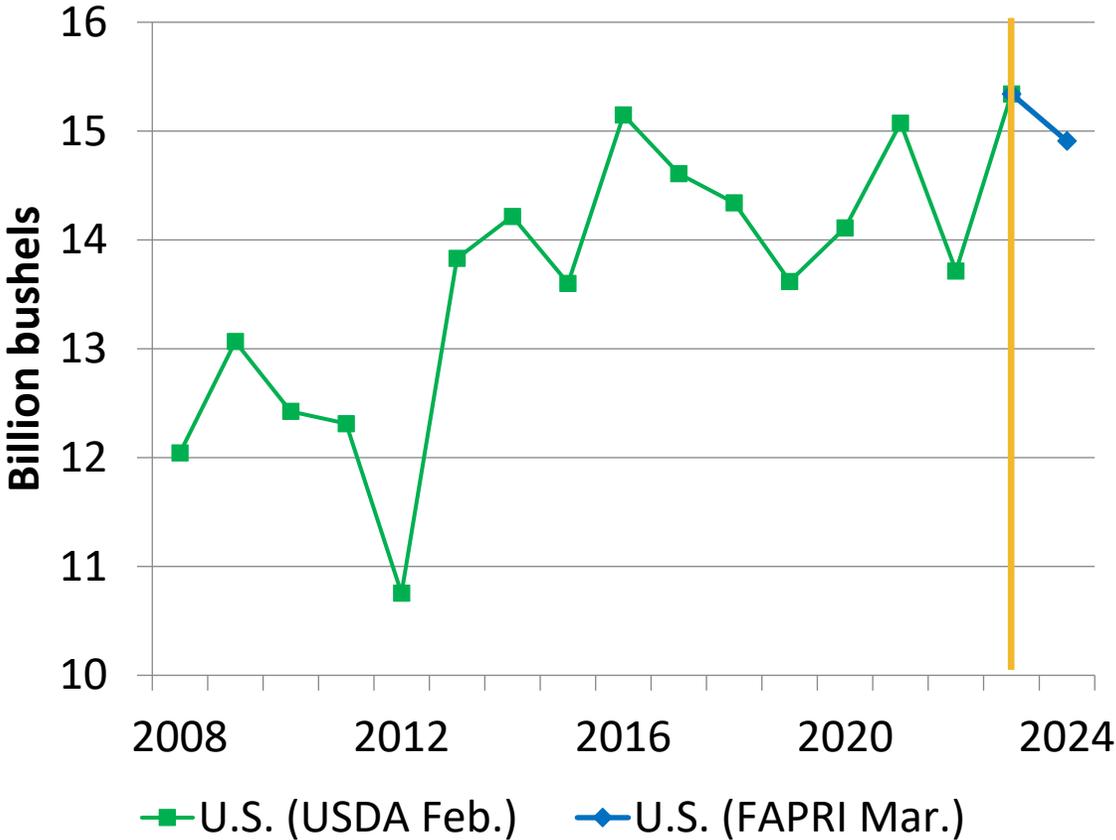
Soybean to corn futures price ratio as of Friday, April 5 = 2.5

# Corn yields and production

### Yields



### Production

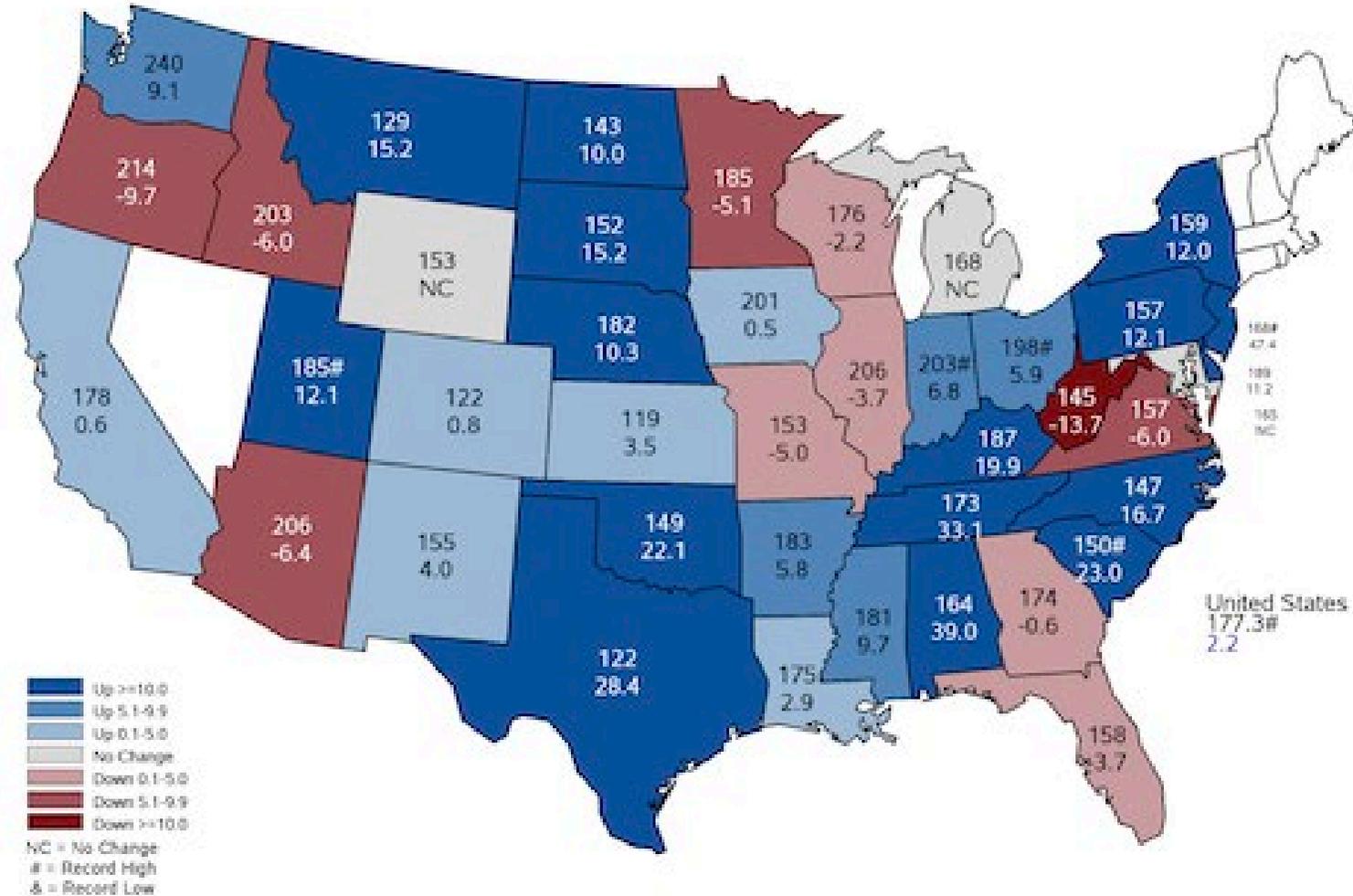


# 2023 Corn Yield

## Bushels and Percent Change from Previous Year

US production revised up 108 million bushels in Jan. combo of less harvested acres and record yield = 177.3 bu/a and record production 15.3 billion bushels

March USDA-Brazil 124 mmt, but still 11 mmt above CONAB ~ 440 million bushels



# U.S corn supply and use

March planting intentions report  
90.04 mil. acres

	2022/23 (USDA)	2023/24 (USDA)	2024/25 (USDA)	2024/25 (FAPRI)
Area planted (mil. acres)	88.2	94.9	91.0	90.1
Yield (bu./harvested acre)	173.4	177.3	181.0	181.4
Production (mil. bu.)	13,651	15,342	15,040	14,909
Feed use	5,487	5,675	5,750	5,539
Ethanol and other domestic use	6,558	6,780	6,805	6,816
Exports	1,661	2,100	2,150	2,491
Ending stocks	1,360	2,172	2,532	2,251
Marketing year avg. price (\$/bu.)	6.54	4.80	4.40	4.39

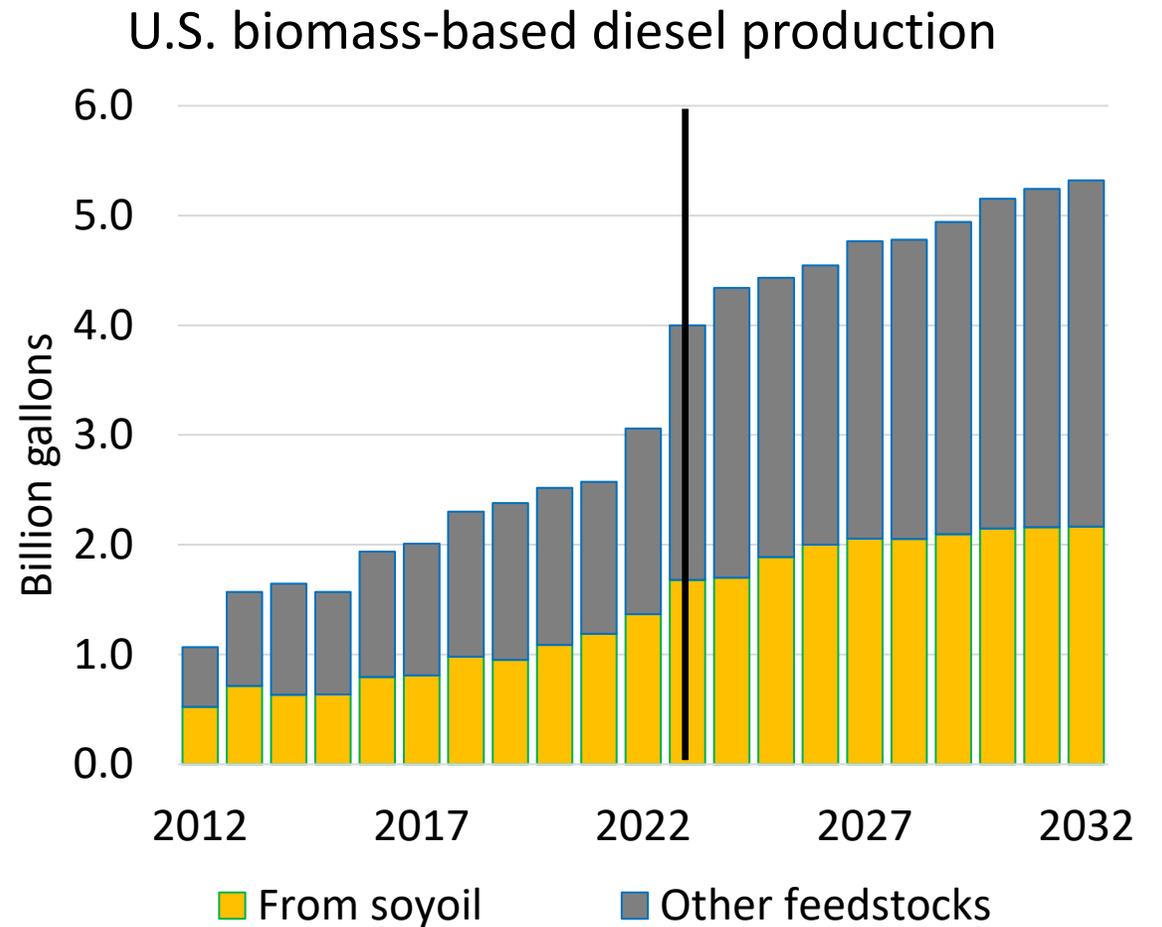
# Soybean outlook

- Demand
  - Domestic: renewable diesel and maybe sustainable aviation fuel
  - Exports: lots of wild cards
- Supply
  - Likely to see area shift to soybeans in 2024
  - Will yields return to trend?
- Prices depend on balance

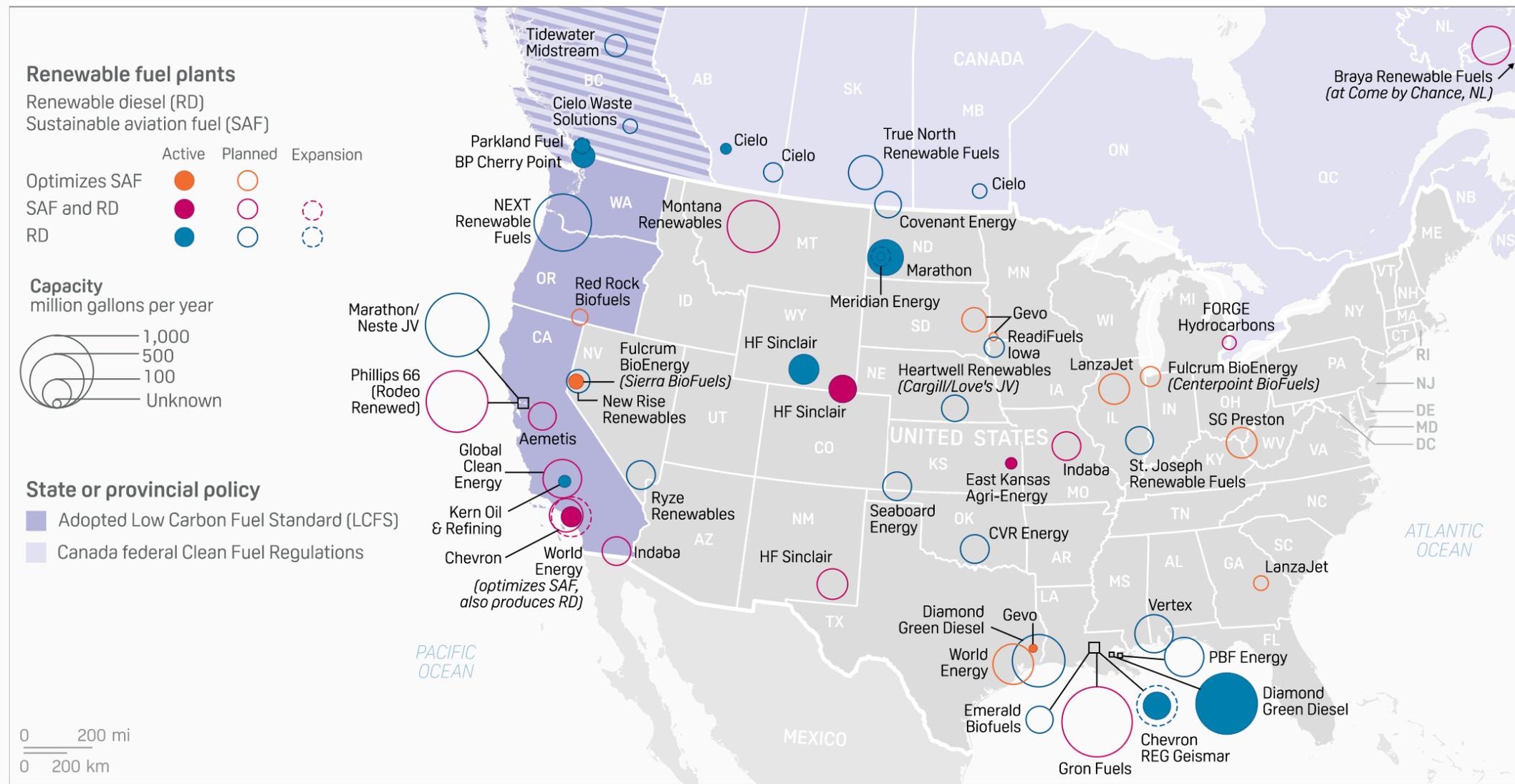


# Biomass-based diesel

- Renewable diesel has grown rapidly, largely because of California LCFS policy and to a lesser extent Oregon and Washington
- Some growth has been at expense of conventional biodiesel
- Overall biofuel consumption has largely matched RFS
- Projections show less growth than implied by new, planned capacity



# Lots of activity in the RD/SAF space

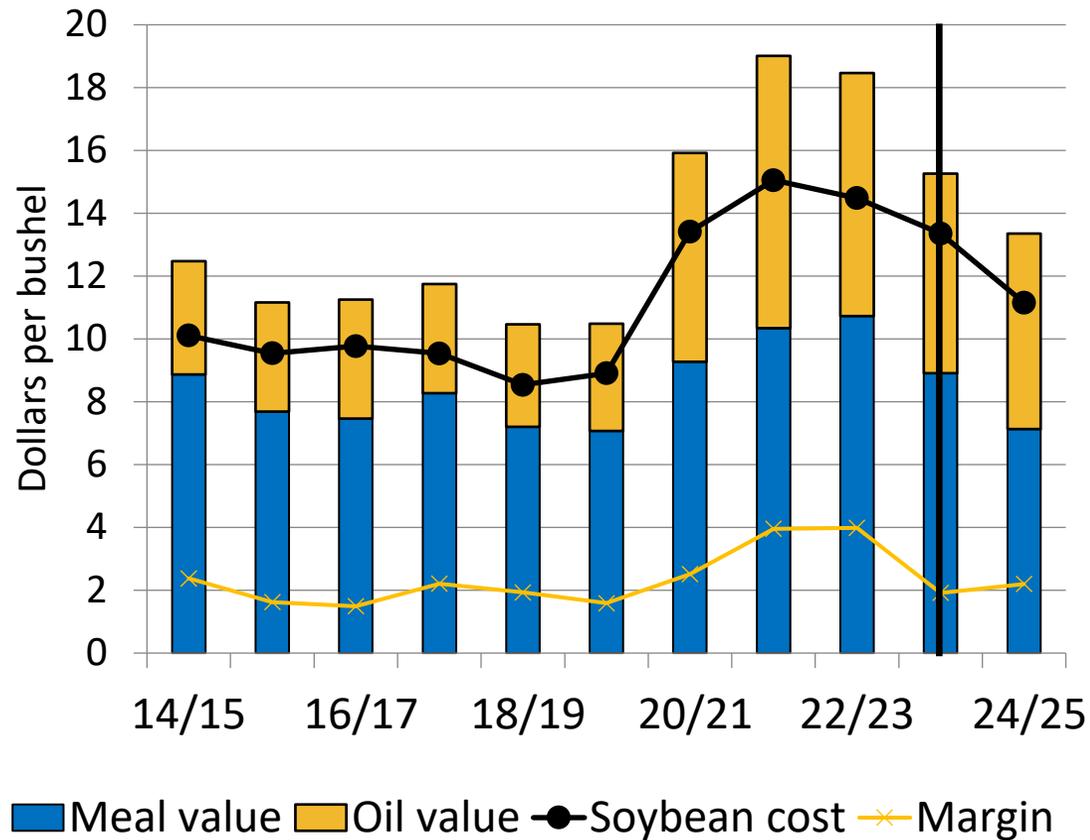


Source: S&P Global Commodity Insights, EIA

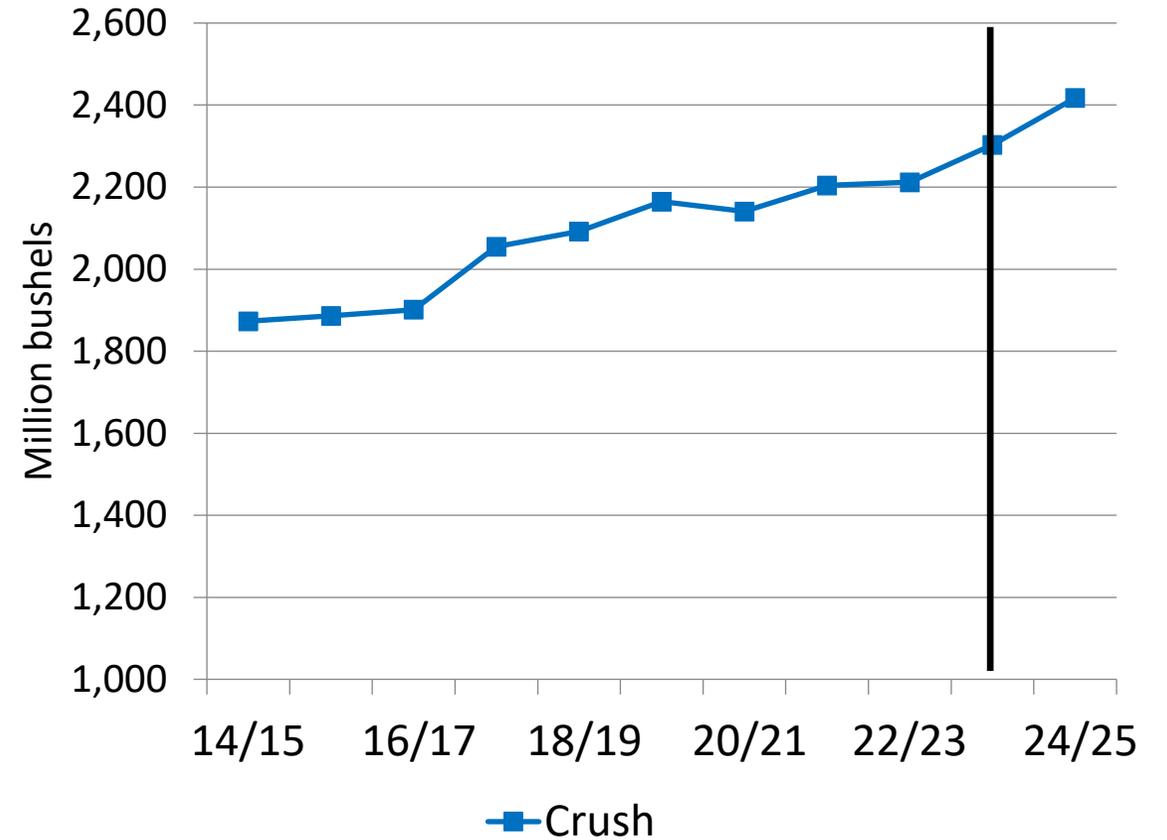
Source: S&P Global, Sept. 2022

# U.S. crushing margins and soybean crush

## Soybean crushing margin



## U.S. soybean crush



# Expanding US Soybean Crush Capacity

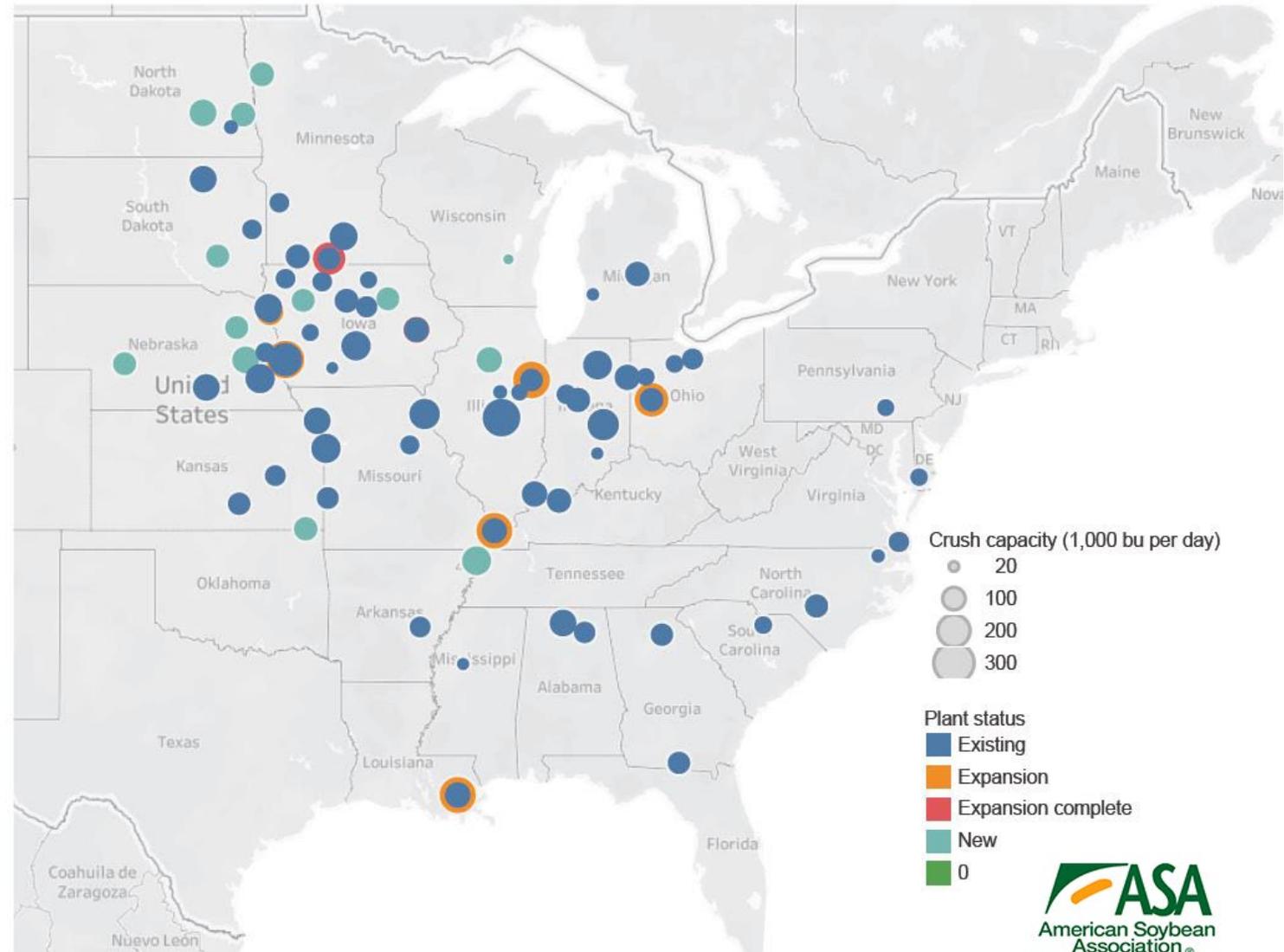
Just because it is planned,  
does not mean it gets built...

...and...

...just because it gets built  
does not mean it operates as  
full capacity.

Our projections imply some  
combination of these options

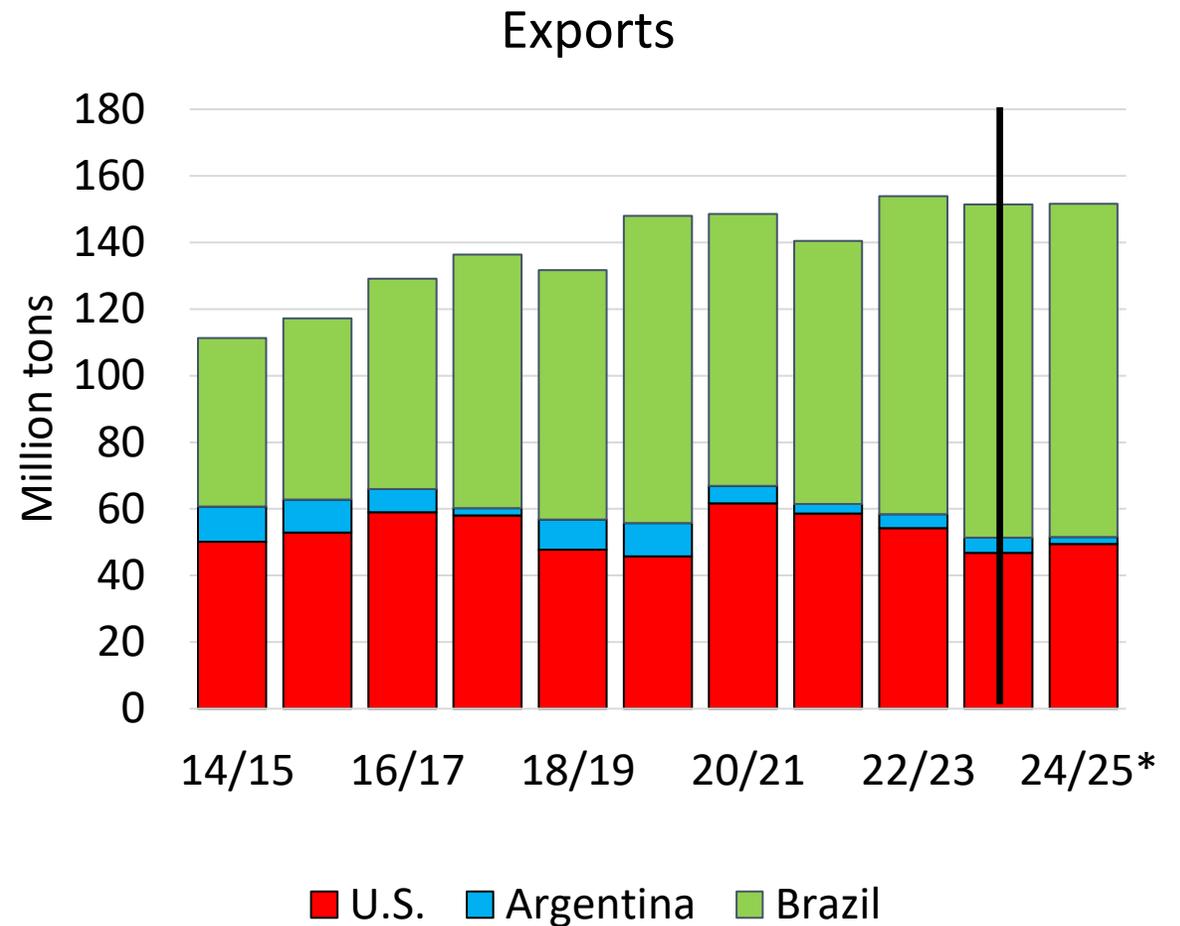
Figure 1. U.S. Soybean Crush Plants



Source: ASA, January 2023

# Soybean exports

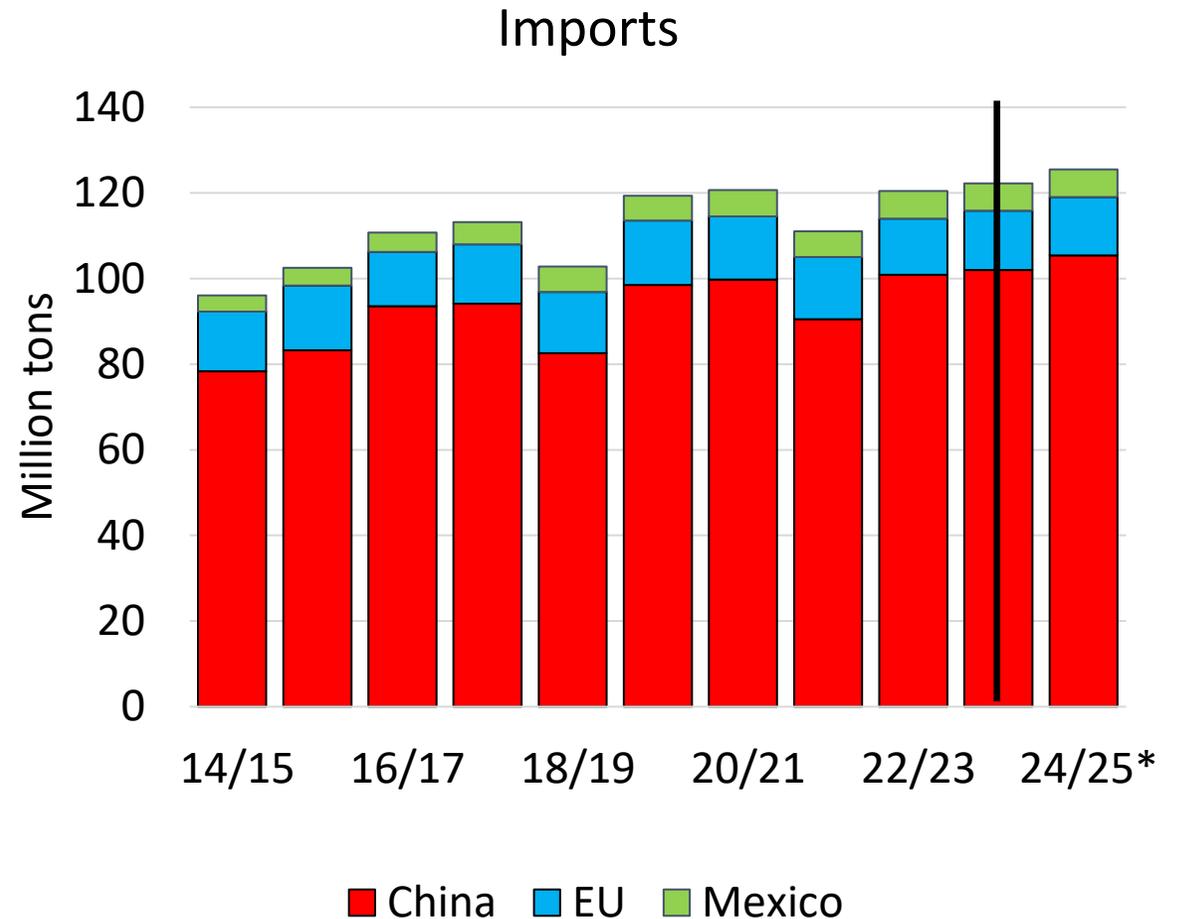
- Prices affected strongly by weather (and more) in major exporters
  - Brazil—small crop in 21/22; large crop in 22/23; strong but not new record 23/24
  - Argentina—very small crop in 22/23, may more than double in 23/24 (mostly exports products, not beans)
  - U.S. exports limited by supplies in 22/23 and 23/24
  - If “normal” crops in 2024, could see larger exports, lower prices



Sources: 2014/15-2023/24 from USDA PSD, Feb. 2024;  
\*2024/25 from FAPRI, Mar. 2024

# Soybean imports

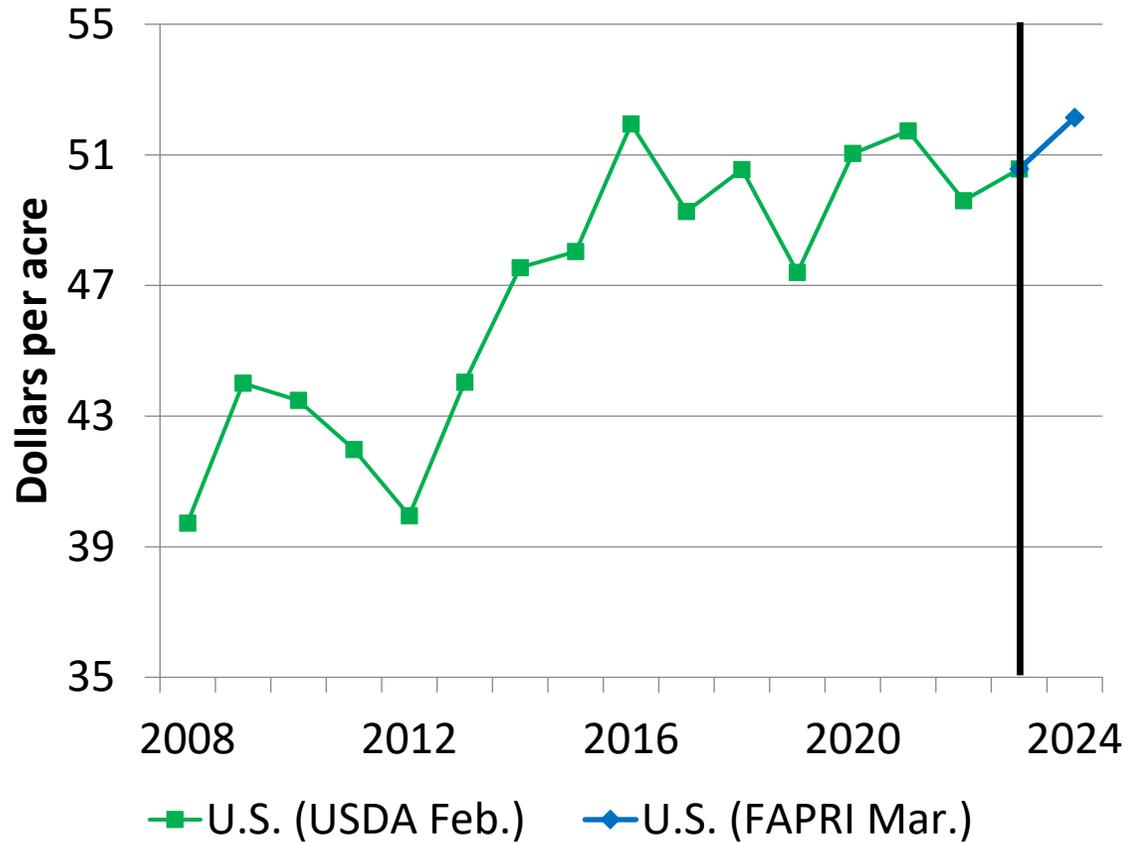
- China dominates
  - 60% of global imports
  - Imports soybeans, not meal or oil
  - Slower growth than in earlier decades, as livestock production grows more slowly
- Future trade issues
  - New growth markets?
  - Will U.S. be able to export increasing amounts of soymeal?



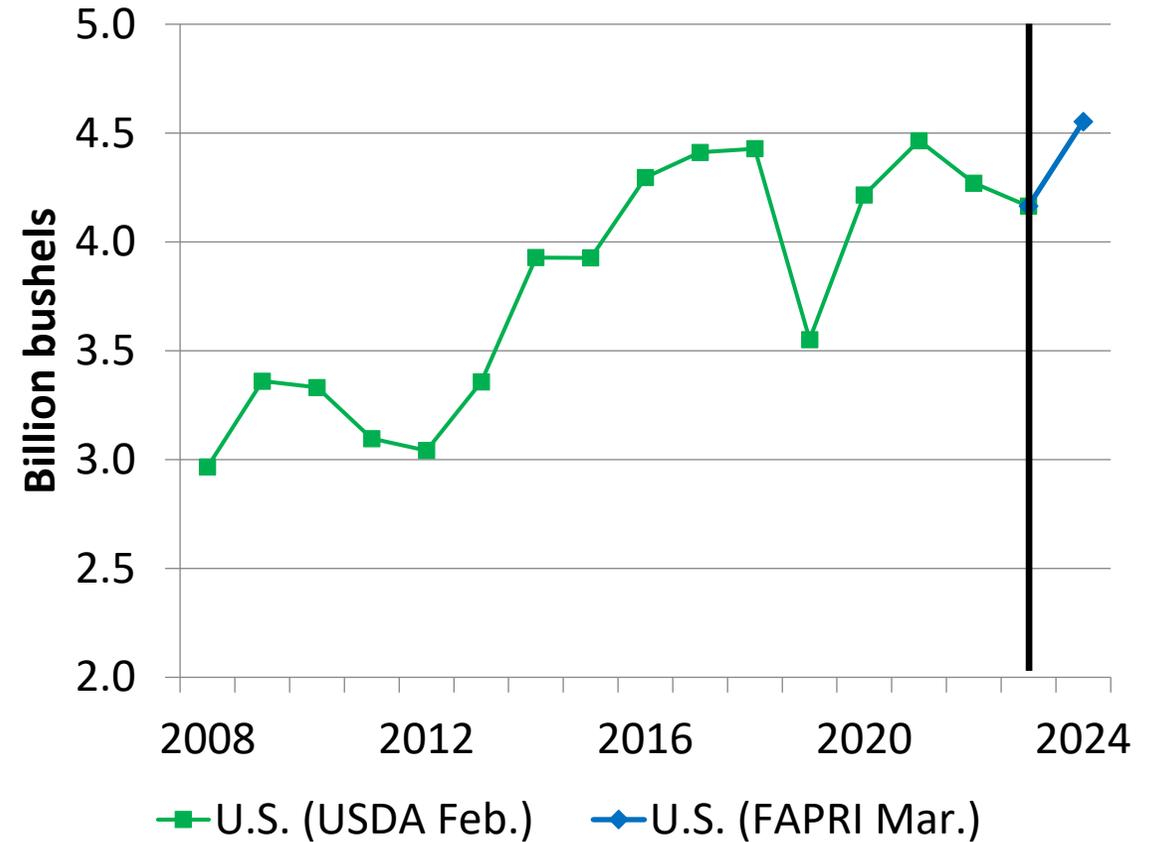
Sources: 2014/15-2023/24 from USDA PSD, Feb. 2024;  
\*2024/25 from FAPRI, Mar. 2024

# Soybean yields and production

## Yields

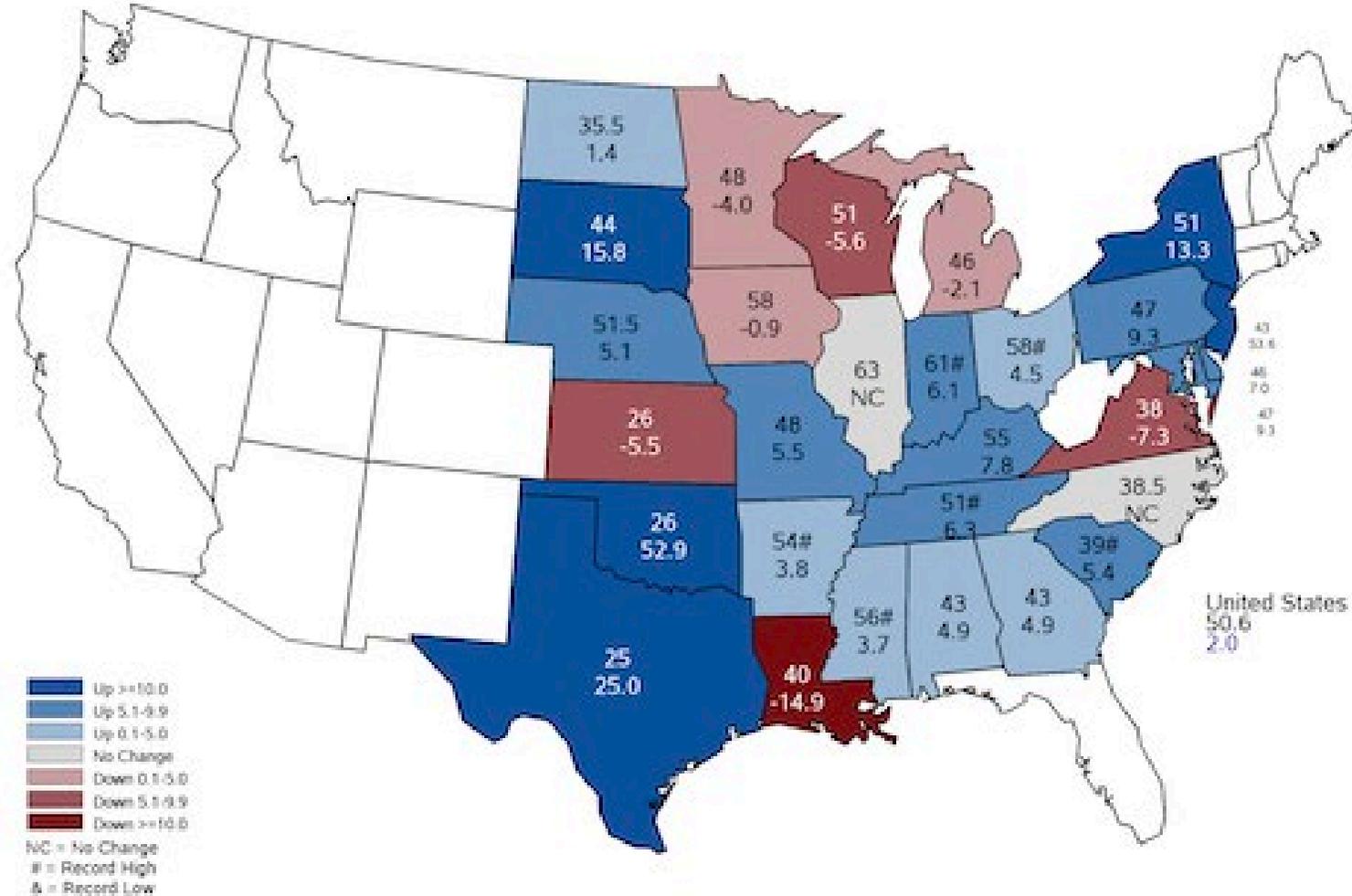


## Production



# 2023 Soybean Yield

## Bushels and Percent Change from Previous Year



US production revised up 35 million bushels in Jan.

March USDA-Brazil 155 mmt, but still 11 mmt above CONAB ~ 297 million bushels

# U.S soybean supply and use

March planting intentions report  
86.51 mil. acres

	2022/23 (USDA)	2023/24 (USDA)	2024/25 (USDA)	2024/25 (FAPRI)
Area planted (mil. acres)	87.5	83.6	87.5	88.2
Yield (bu./harvested acre)	49.6	50.6	52.0	52.1
Production (mil. bu.)	4,270	4,165	4,505	4,553
Crush	2,212	2,300	2,400	2,417
Seed and residual use	101	124	125	124
Exports	1,992	1,720	1,875	1,869
Ending stocks	264	315	435	442
Marketing year avg. price (\$/bu.)	14.20	12.65	11.20	10.73

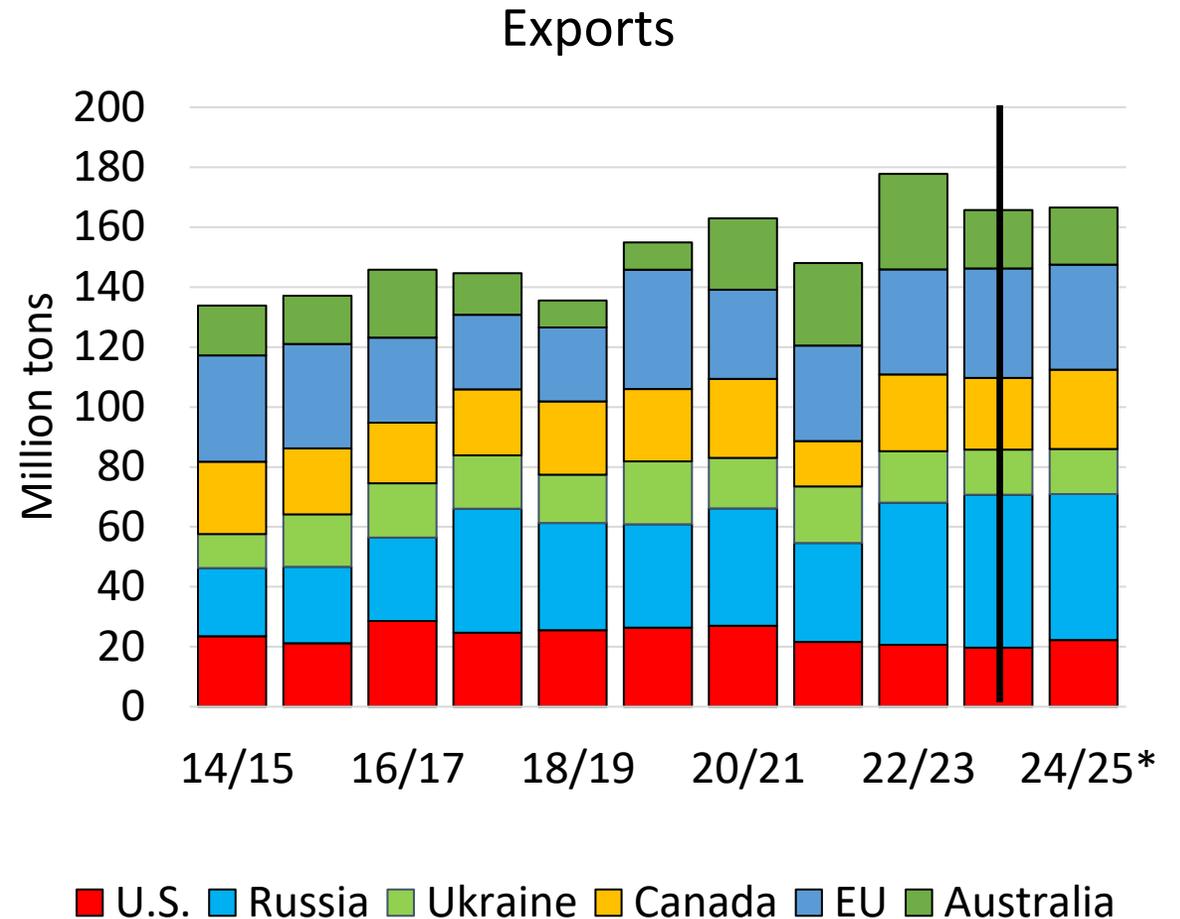
# Wheat outlook

- Demand
  - Domestic demand: no big shifts
  - Exports: strong competition
- Supply
  - Production costs high, but fertilizer prices have declined
  - Will spring wheat plantings increase?
- Prices depend on export demand



# Wheat exports

- Prices affected strongly by weather (and more) in major exporters
  - Russia—record crop in 22/23; nearly as large crop in 23/24
  - Ukraine—crop size impacted from war, but more than offset by Russia exports
  - U.S. exports face strong competition in 23/24 and 24/25
  - Australia—el Niño affect supplies 23/24
  - If “normal” crops in 2024, could see larger exports, lower prices

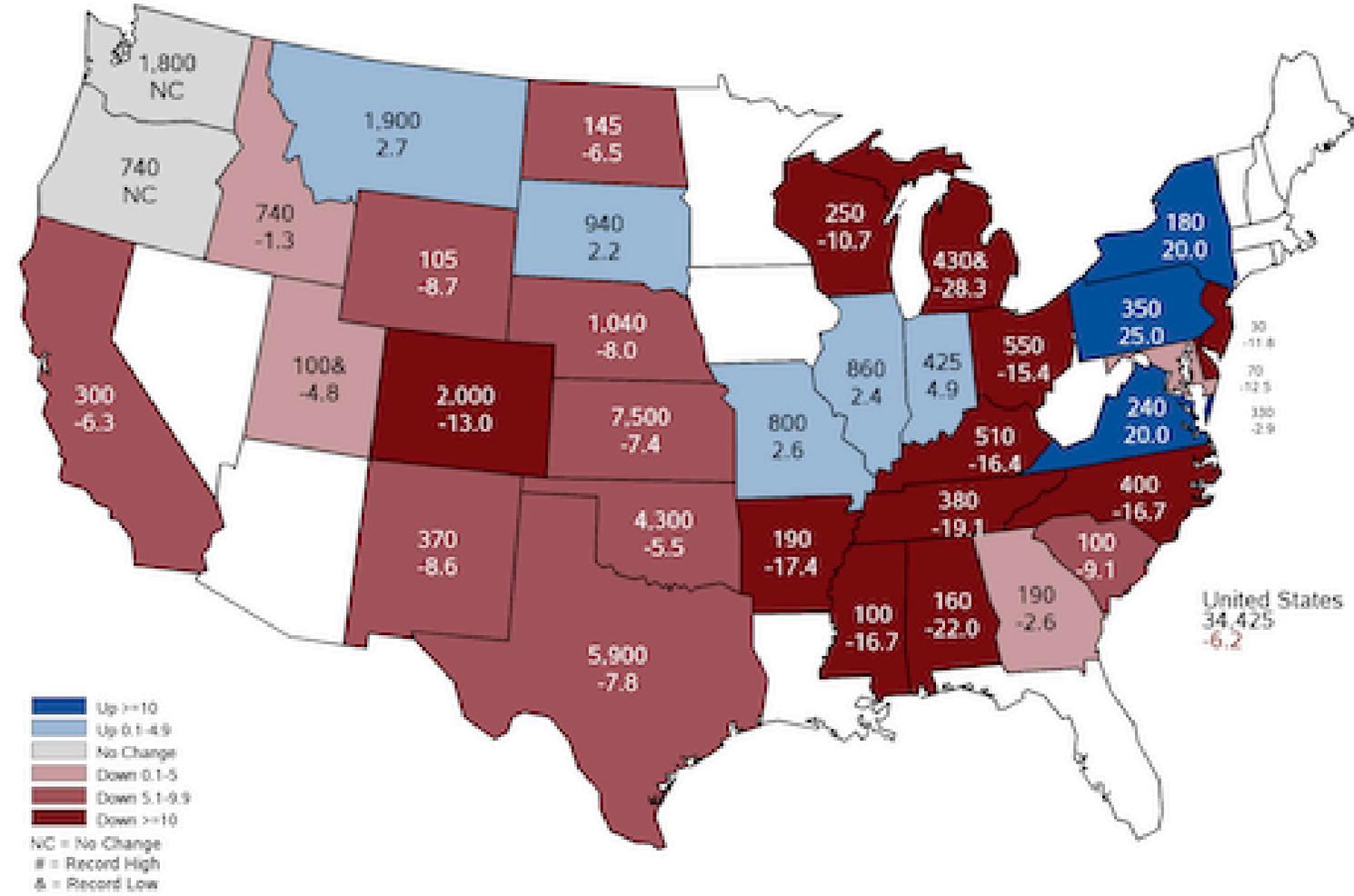


Sources: 2014/15-2023/24 from USDA PSD, Feb. 2024;  
\*2024/25 from FAPRI, Mar. 2024

# 2024 Winter Wheat Planted Acres

## Thousand Acres and Percent Change from Previous Year

Winter wheat seedings:  
down 2.56 million acres y/y

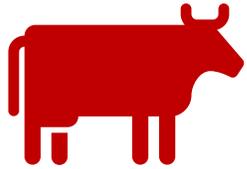


# U.S wheat supply and use

March planting intentions report  
47.49 mil. acres

	2022/23 (USDA)	2023/24 (USDA)	2024/25 (USDA)	2024/25 (FAPRI)
Area planted (mil. acres)	45.8	49.6	47.0	47.6
Yield (bu./harvested acre)	46.5	48.6	49.5	51.2
Production (mil. bu.)	1,650	1,812	1,900	1,973
Feed and residual use	77	120	110	115
Food and seed use	1,041	1,024	1,024	1,040
Exports	759	725	775	819
Ending stocks	570	658	769	772
Marketing year avg. price (\$/bu.)	8.83	7.20	6.00	6.13

# Livestock Outlook: Can We Stay Ahead of Costs?



## Despite a little pullback Fall 2023, prices rebound

Cattle prices on a record run which should continue

Hog and milk prices retreating from lofty levels of 2022



## Record-high costs have been slowly receding

Feed prices the main culprit – more corn price relief ahead?

Non-feed costs are not as likely to decline noticeably



## Many issues to track in the coming year

Which economic signals will drive U.S. consumer spending?

Will dry weather continue to hamper yields and pastures (62% chance to turn back to La Nina- June, July, August)?

What international developments will impact U.S. markets?

# Drought Improves, especially in the West & Southern Plains

Mar. 26, 2024: 18% D1 or worse

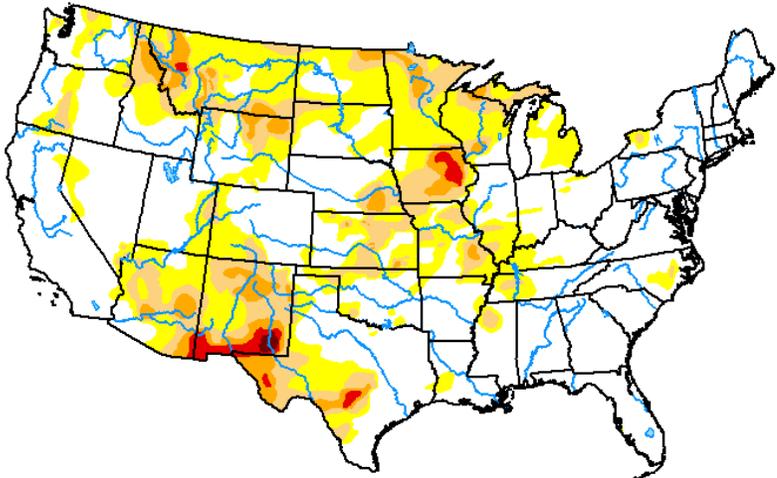
Mar. 28, 2023: 31% D1 or worse

**U.S. Drought Monitor**  
**Contiguous U.S. (CONUS)**

**March 26, 2024**  
*(Released Thursday, Mar. 28, 2024)*  
Valid 8 a.m. EDT

**U.S. Drought Monitor**  
**Contiguous U.S. (CONUS)**

**March 28, 2023**  
*(Released Thursday, Mar. 30, 2023)*  
Valid 8 a.m. EDT



**Intensity:**

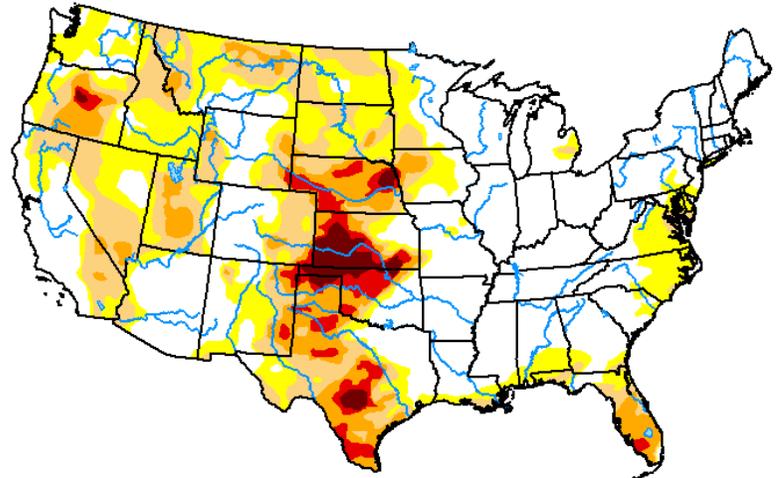
- None
- D0 Abnormally Dry
- D1 Moderate Drought
- D2 Severe Drought
- D3 Extreme Drought
- D4 Exceptional Drought

*The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to <https://droughtmonitor.unl.edu/About.aspx>*

**Author:**  
Brad Rippey  
U.S. Department of Agriculture



[droughtmonitor.unl.edu](https://droughtmonitor.unl.edu)



**Intensity:**

- None
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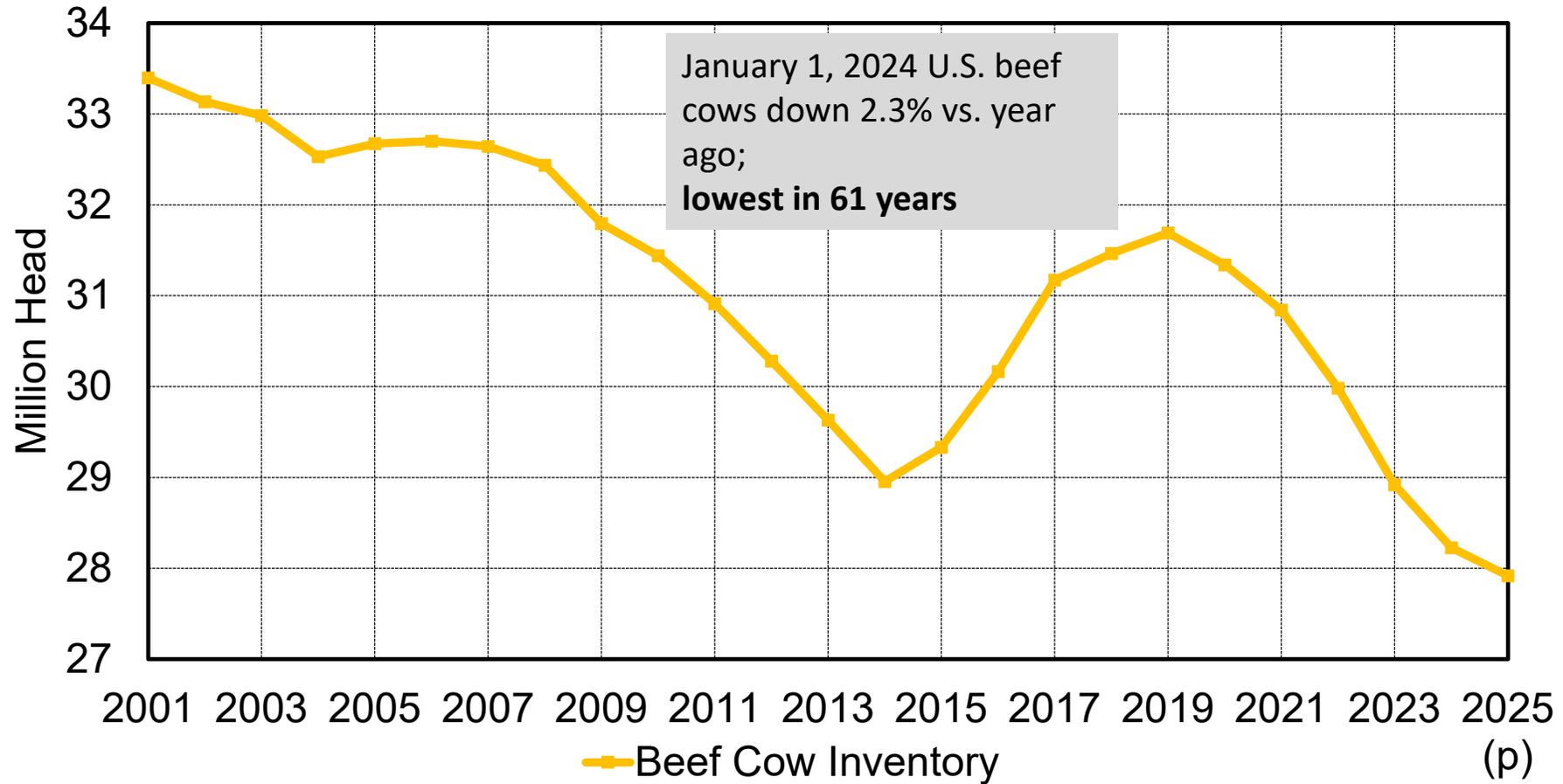
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**Author:**  
Curtis Riganti  
National Drought Mitigation Center

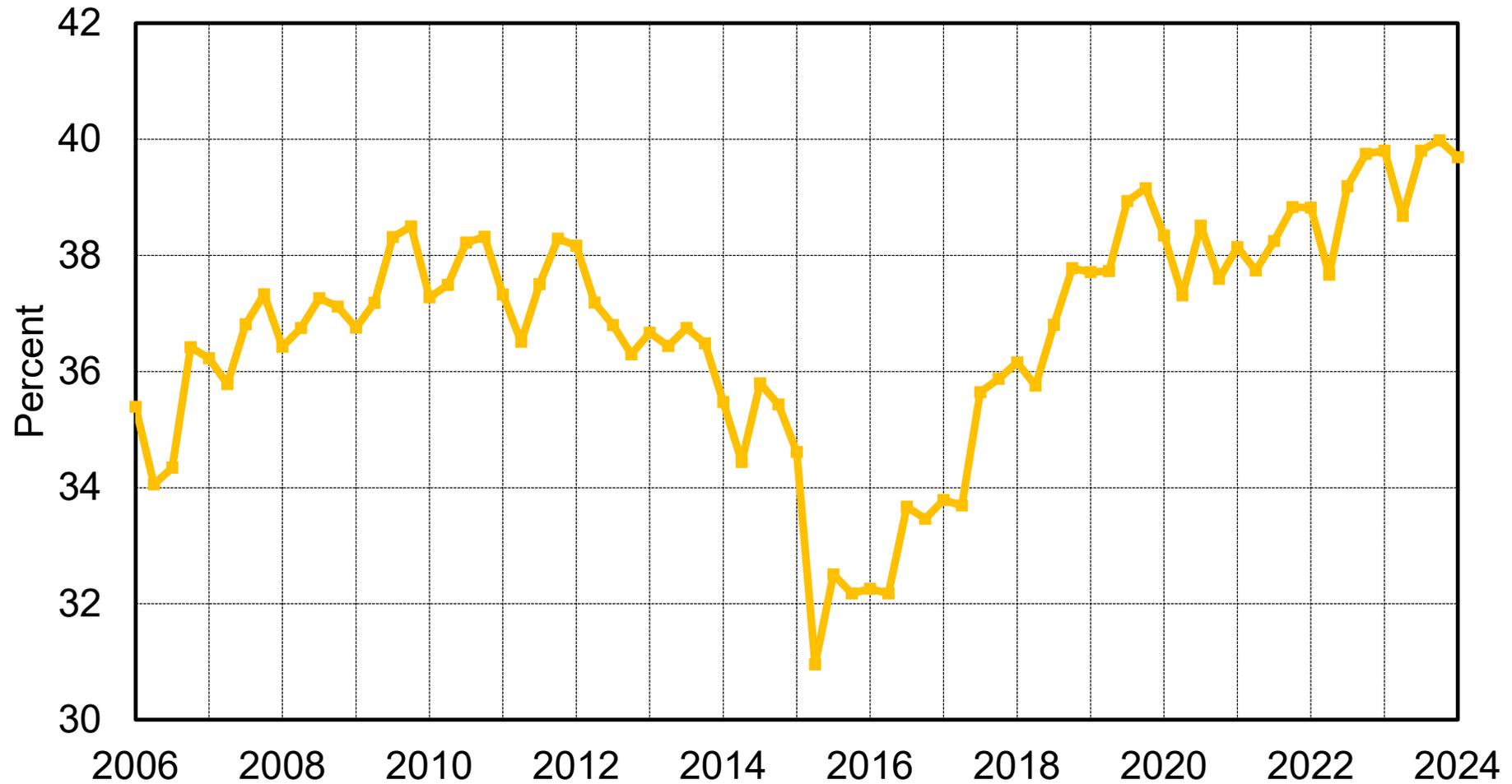


[droughtmonitor.unl.edu](https://droughtmonitor.unl.edu)

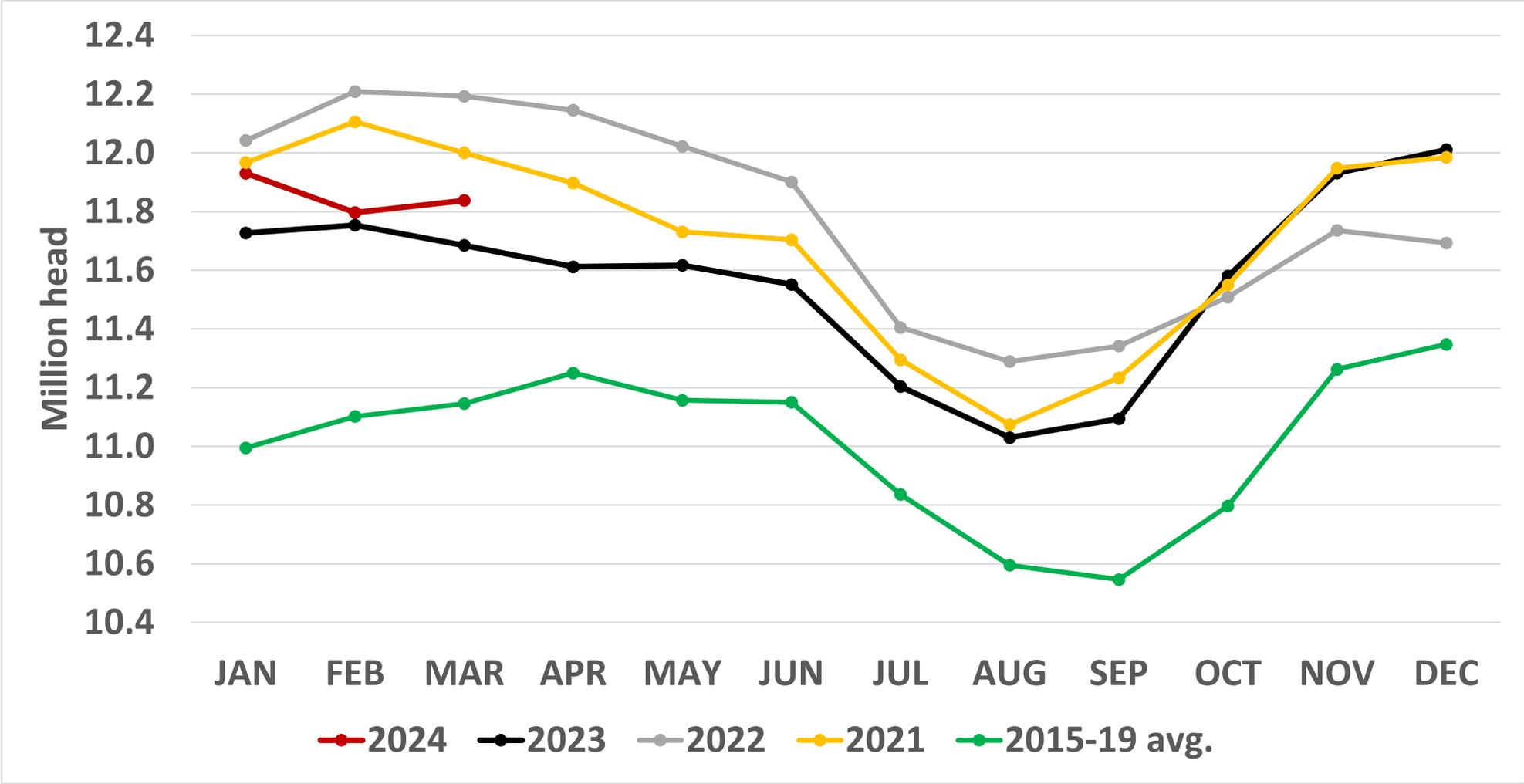
# Beef Cow Herd Continues to Decline



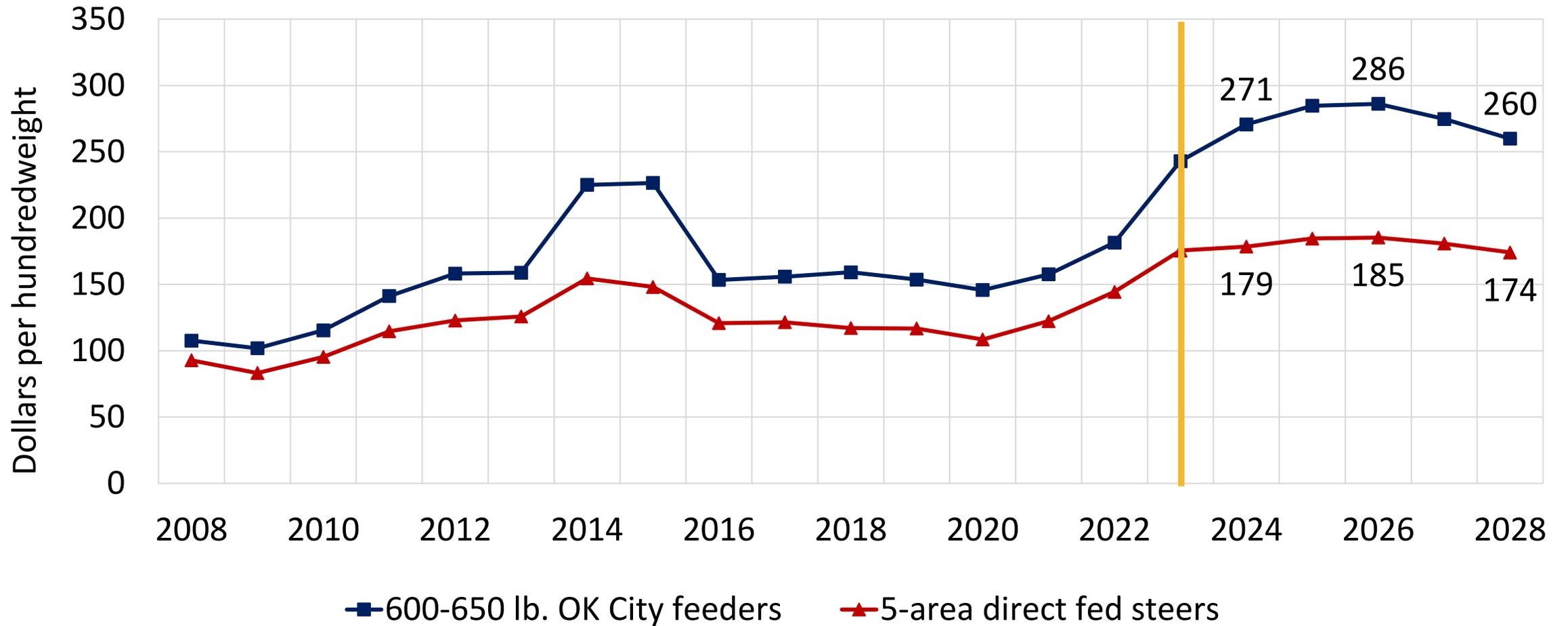
# Heifers / Total Cattle on Feed



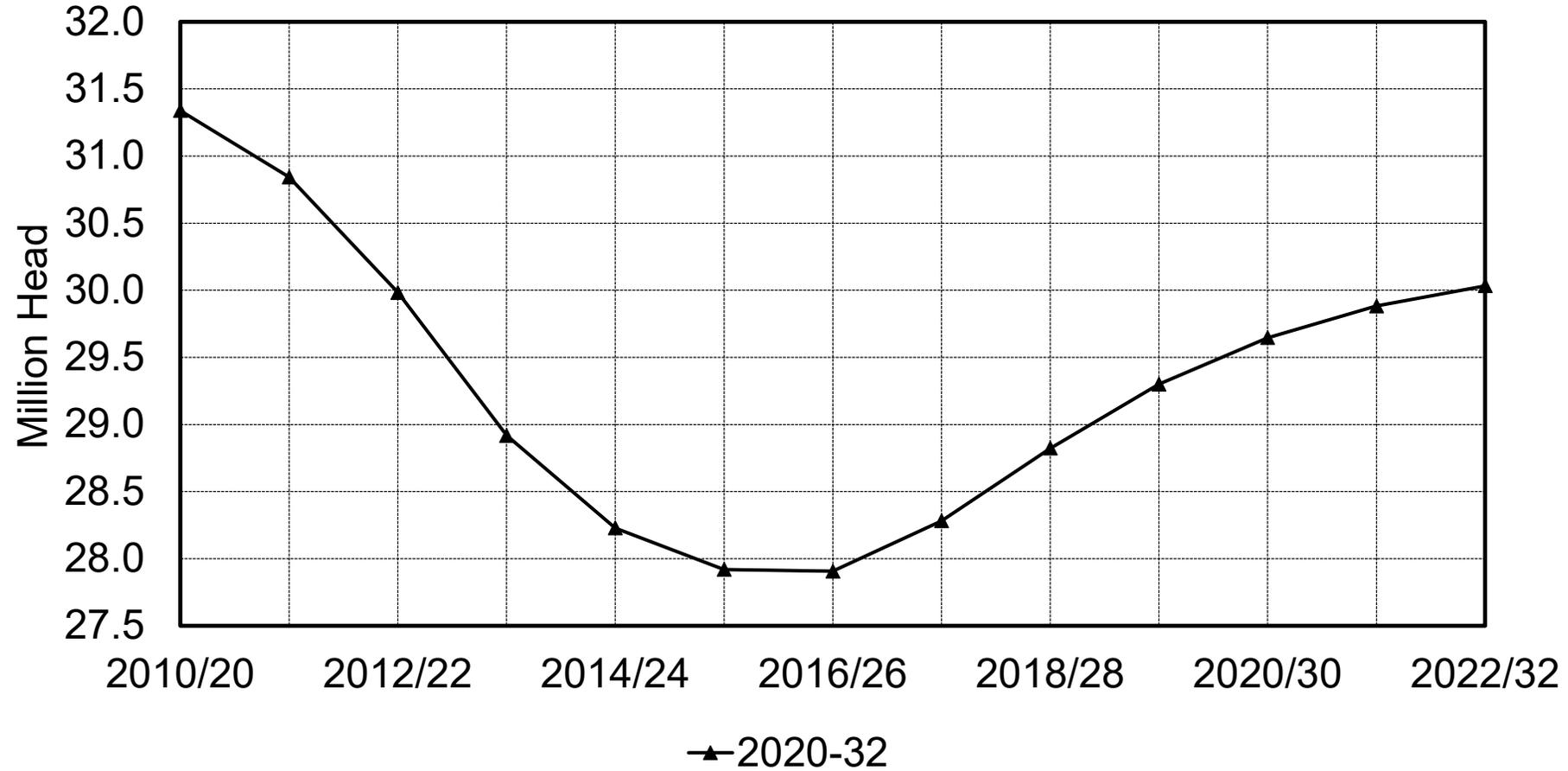
# Cattle on Feed, 1000+ Capacity Lots



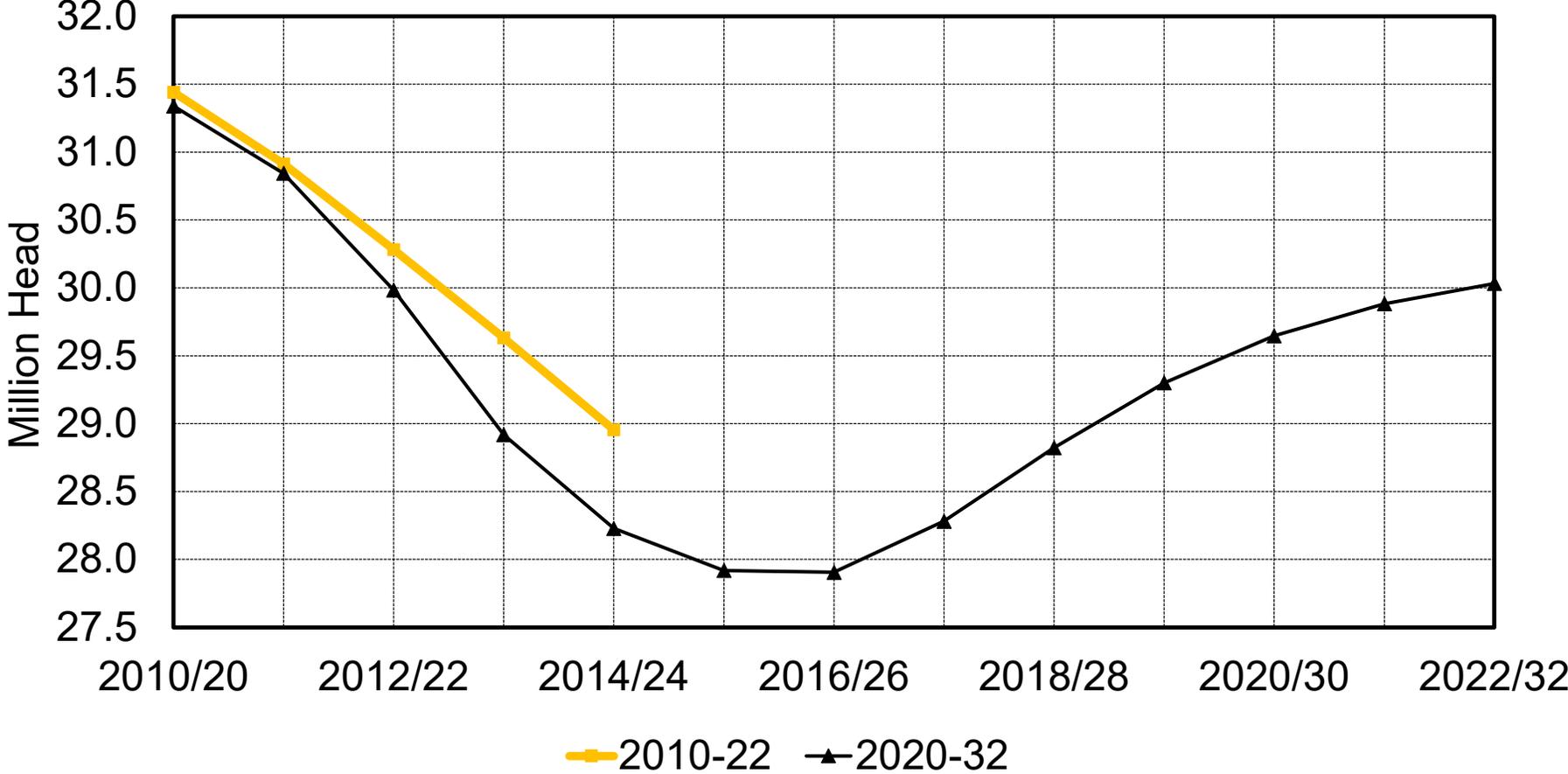
# U.S. Cattle Prices



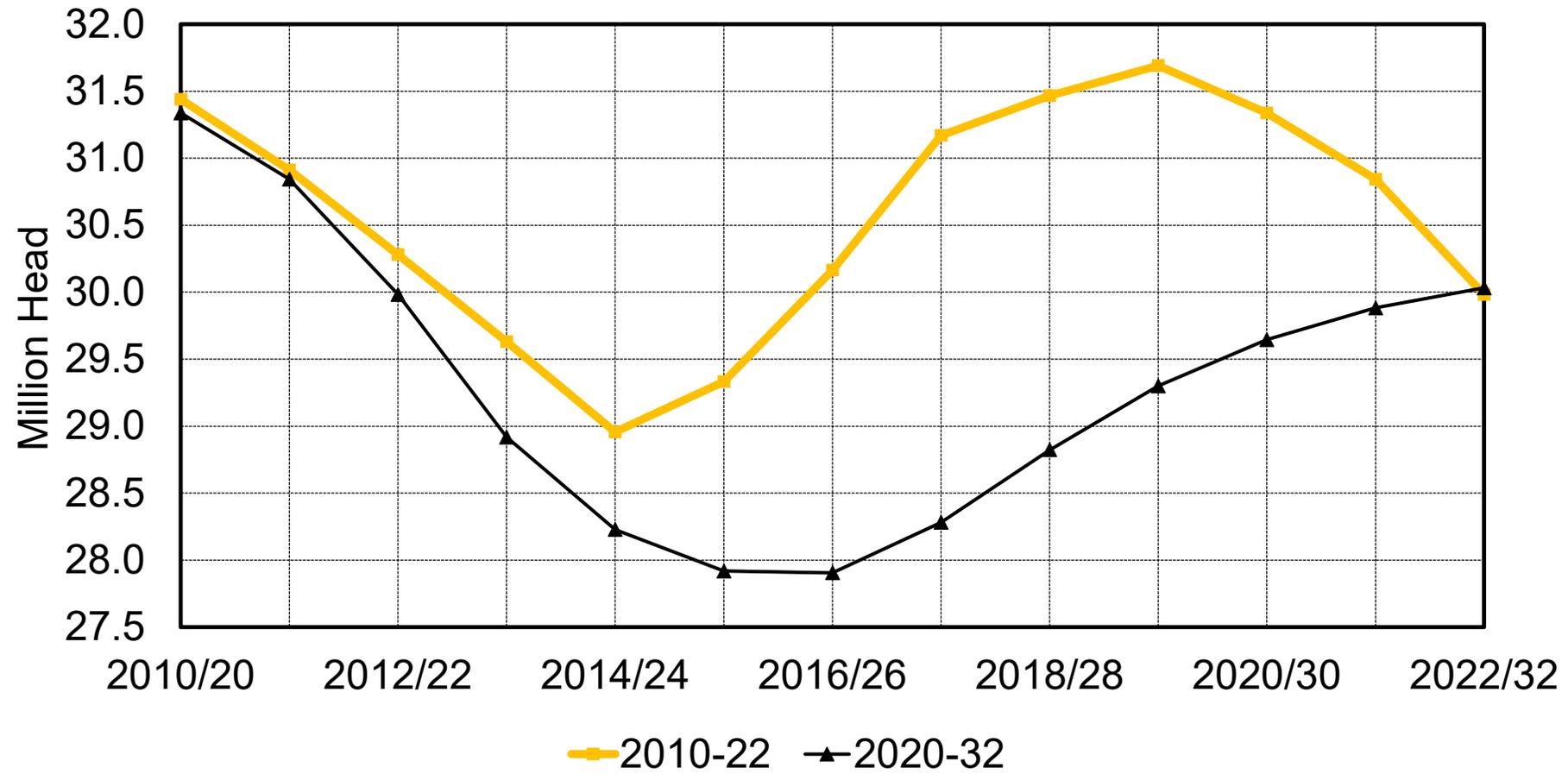
# Comparing 2 Cattle Cycles – Beef Cows



# Comparing 2 Cattle Cycles – Beef Cows



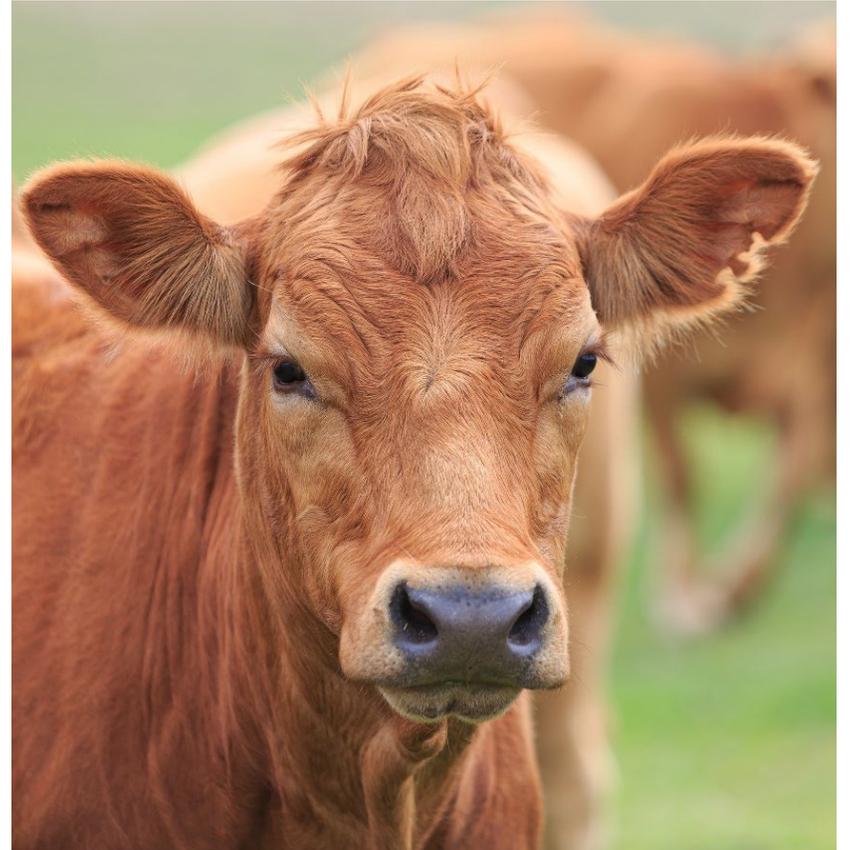
# Comparing 2 Cattle Cycles – Beef Cows



# Cattle Outlook: Positives and Unknowns

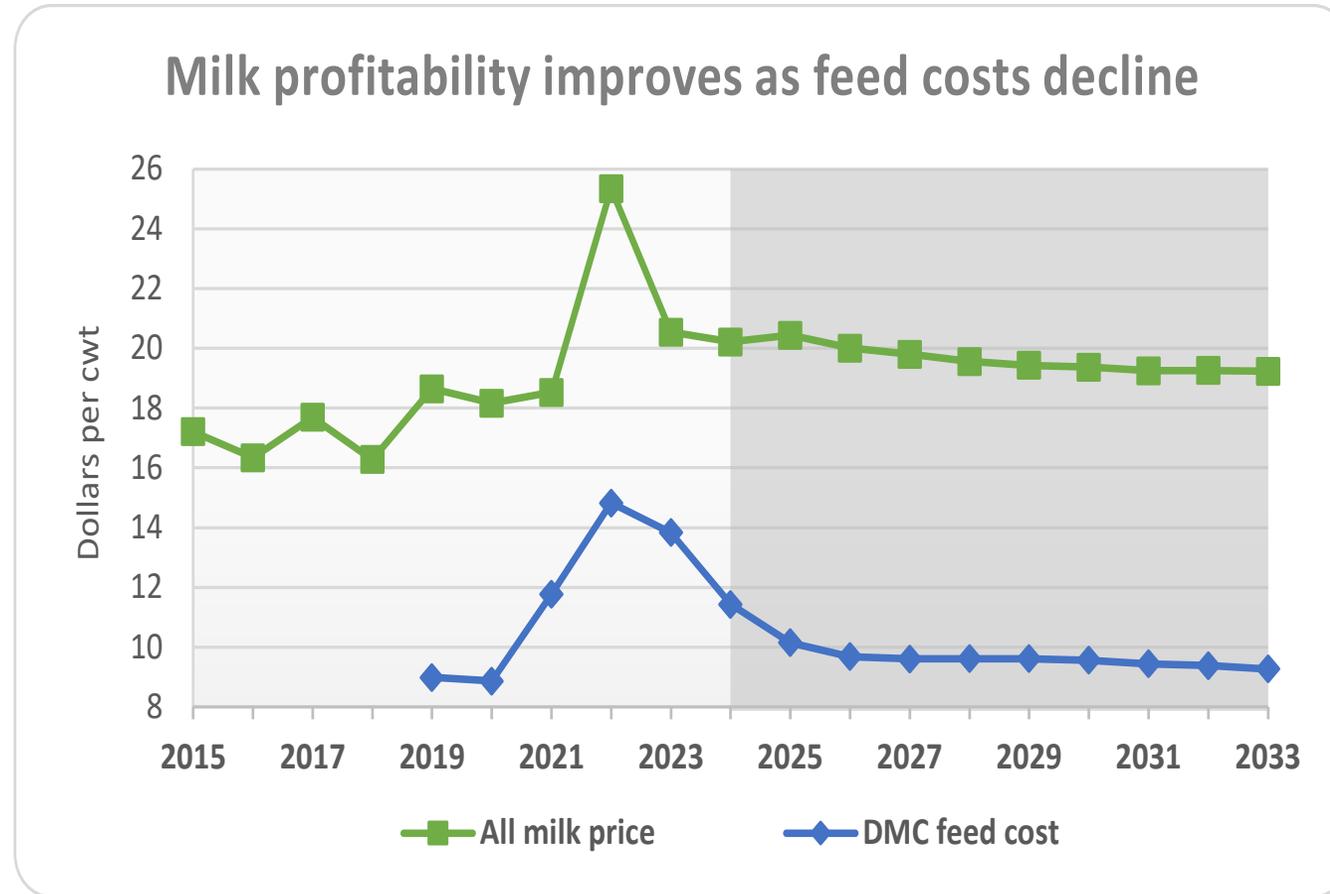
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- Supply
  - 2023 beef production was lower; first time since 2015
  - Drought had offset economic incentives for herd rebuilding
- Demand
  - U.S. consumers still demanding beef even at higher prices
  - Export volumes have struggled with recent higher price levels
- Risks remain
  - Forage availability in some areas, feed prices still a concern through 2023 and to begin 2024
  - Production cost increases hamper all livestock operations
  - If/when an expected recession slows consumer spending?



# Milk profitability improves

- Even with the all milk price averaging above \$20 per cwt, the Dairy Margin Coverage (DMC) program paid out more than \$1 billion on payments last year as feed costs remained well above average.
- Though little change is expected for milk prices in the next couple of years, declining feed expenses will allow finances to improve for many operations.
- Producers wishing to sign up for DMC coverage in 2024 have until April 29 to do so.

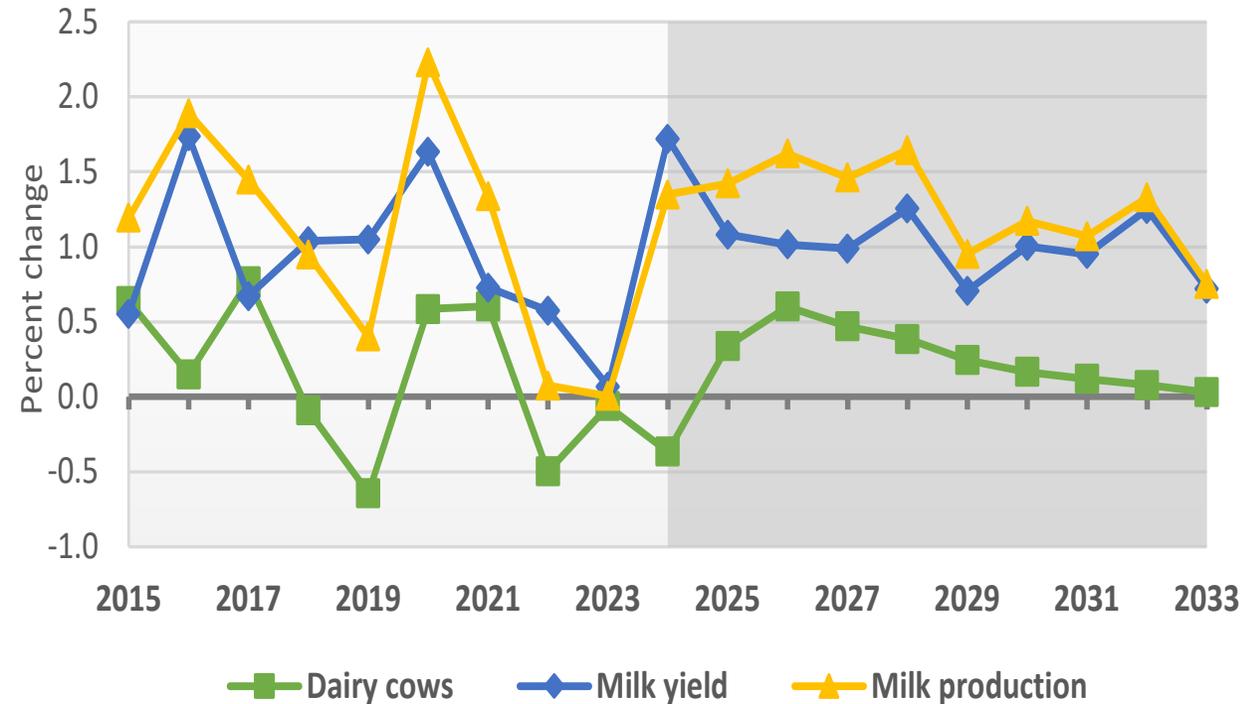


# Dairy cow numbers

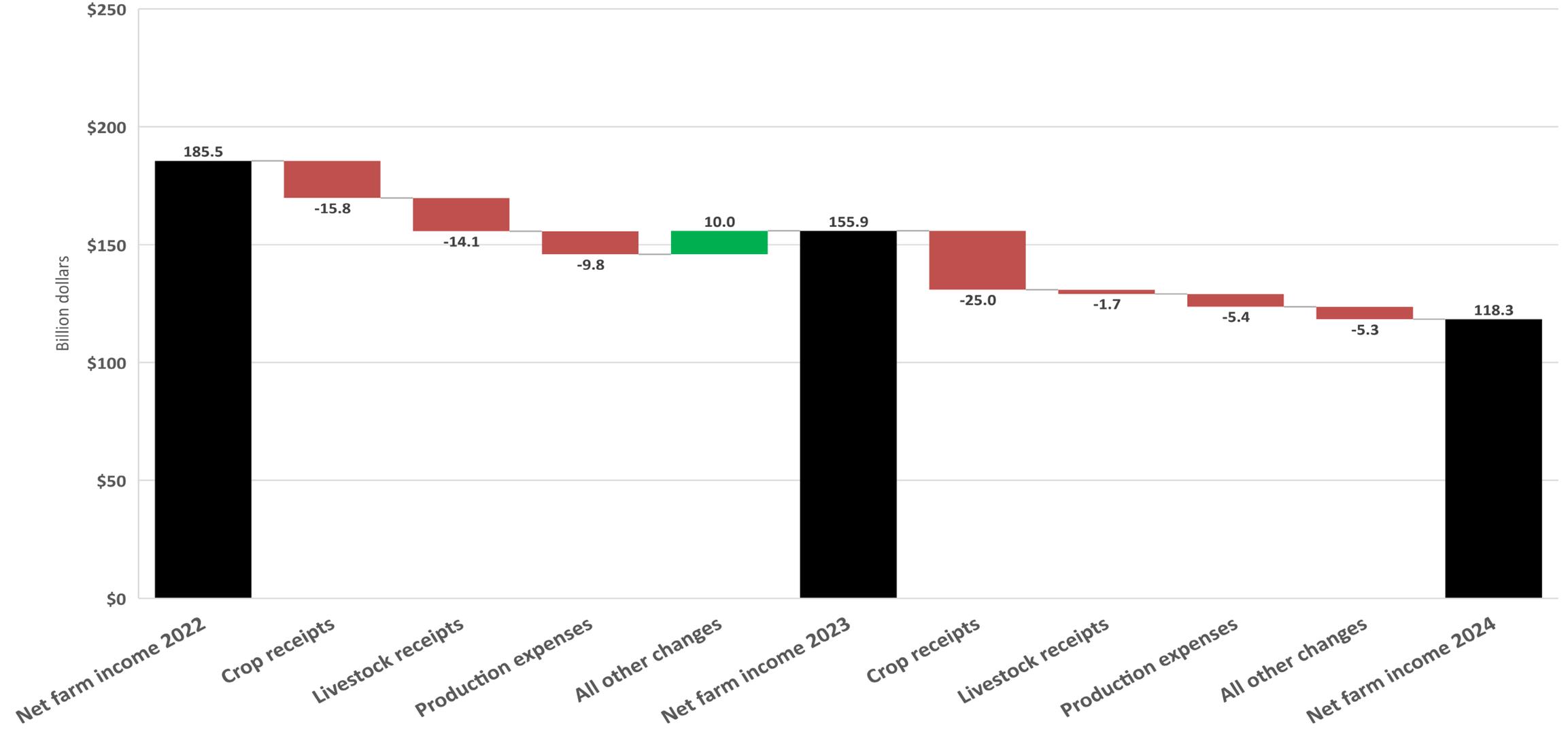
- Monthly U.S. dairy cow inventories posted their third lowest level since the spring of 2016 to begin 2024.
- Even as profitability improves with declining feed costs this year, it is expected to take a little time for producers to again increase the milk cow herd.
- Milk yields are expected to bounce back in 2024 following the weakest growth since 2001 last year.
- Milk production is expected to grow at an average rate of 1.5 percent for the next few years, which will require export growth to resume and some domestic demand expansion to keep milk prices at projected levels.

Bovine Influenza A virus (BIAV) –  
Reportedly affecting older lactating  
dairy cows; not considered a safety  
concern for pasteurized milk

## Dairy cow numbers decline again in 2024



# U.S. net farm income changes, 2022-2024



# The farm bill: some basics

- Sets farm and food policy, usually for about 5 years
- 2018 farm bill was extended for 1-year on November 16, 2023
  - Some provisions will again expire on October 1, 2024.
  - Dairy provisions revert to “permanent law” on January 1, 2025.
  - Crop provisions do the same spring 2025 crop if nothing is done

**Table 1. Parity Prices and Permanent Law Support Prices**

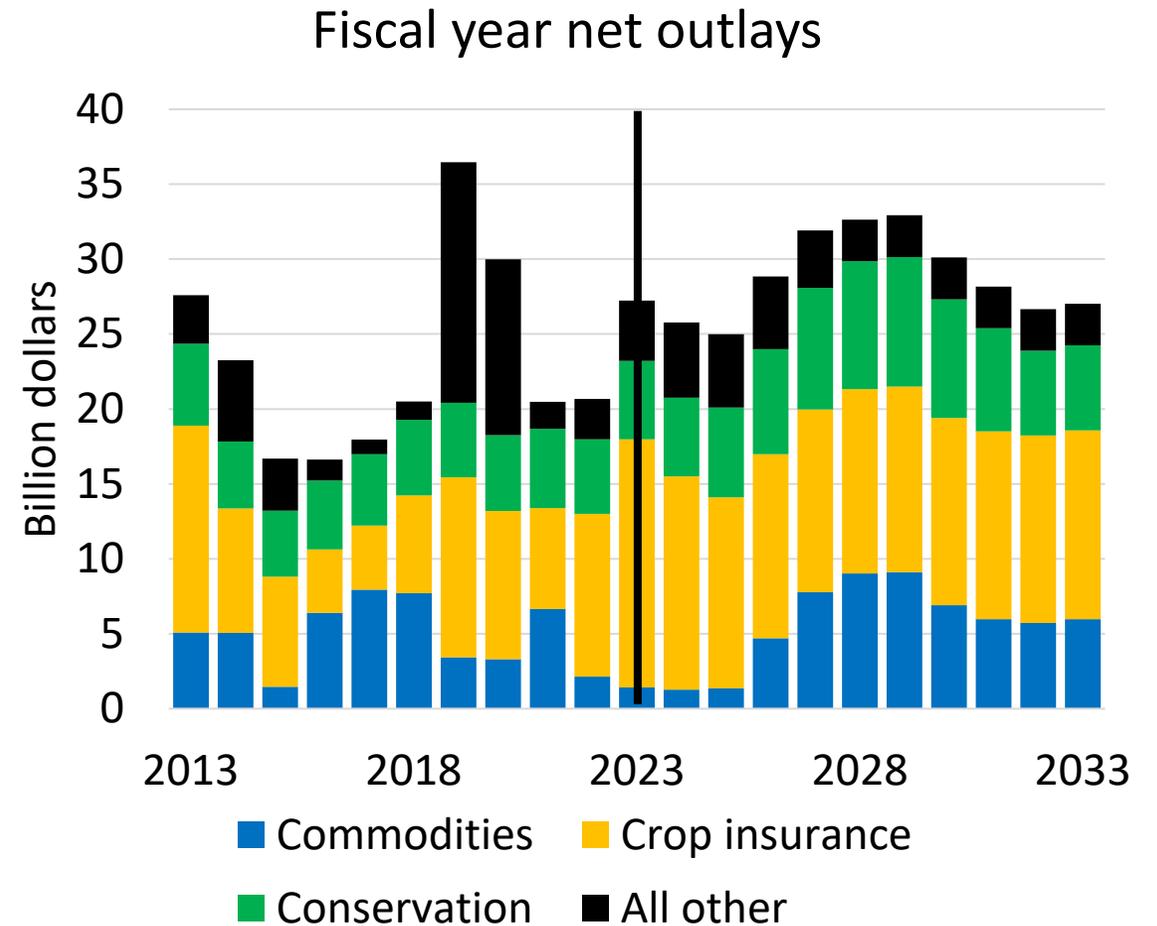
Commodity <sup>a</sup>	Description	Permanent Law Provisions		2018 Farm Bill Support Price <sup>b</sup>	Farm Prices Received (May 2023)
		Parity Price	Permanent Law Support Price (minimum of range)		
All Milk, Cwt.	Purchase milk and butterfat products at 75%-90% of parity.	\$67.60	75% of parity = \$50.70	Margin-based <sup>c</sup>	\$19.30
Wheat, Bu.	Nonrecourse loans and direct purchases. Acreage allotments. <sup>d</sup> If marketing quotas are approved, loan rate = 65%-90% of parity. <sup>e</sup> If quotas are not approved, loan rate = 50% parity. If quotas are not announced, loan = 75%-90% parity.	\$20.40	75% of parity = \$15.30	\$3.38	\$8.07
Upland cotton, Lb.	Nonrecourse loans and direct purchases. Acreage allotments. If quotas are approved, loan rate = 65%-90% of parity. If quotas are not approved, loan rate = 50% parity. If quotas are not announced, loan rate = 65%-90% of parity.	\$2.48	65% of parity = \$1.61	\$0.52	\$0.853
Rice, Cwt.	Permanent authority repealed by 1981 farm bill but restored by 1996 farm bill. Loan rate = 50%-90% of parity.	\$48.50	50% of parity = \$24.25	\$7.00	\$18.90
Corn, Bu.	Nonrecourse loans and direct purchases. Acreage allotments are not authorized. Loan rate = 50%-90% of parity.	\$15.30	50% of parity = \$7.65	\$2.20	\$6.54
Sorghum, Cwt.	Support for sorghum, barley, oats, and rye is set based on the feeding value of each in relation to corn.	\$27.00	50% of parity = \$13.50	\$3.93 <sup>f</sup>	\$11.60
Barley, Bu.		\$18.40	50% of parity = \$9.20	\$2.50	\$7.56
Oats, Bu.		\$11.30	50% of parity = \$5.65	\$2.00	\$4.31
Rye, Bu.		\$22.50	50% of parity = 11.25	none	\$6.75 <sup>e</sup>
Honey, Lb.	Purchases of honey at 60%-90% of parity.	\$7.44	60% of parity = \$4.46	\$0.69	\$2.98 <sup>h</sup>

Source: CRS, using USDA National Agricultural Statistics Service (NASS), Agricultural Prices, June 30, 2023; the Agricultural Conservation Act of 1981 (16 U.S.C. 1421-34) and the Agricultural Policy in Law: The Effects of Failure to Reauthorize the New Farm Bill on the U.S. Farm Sector.

Source: CRS Report R47659, August 2023,  
<https://crsreports.congress.gov/product/pdf/R/R47659>

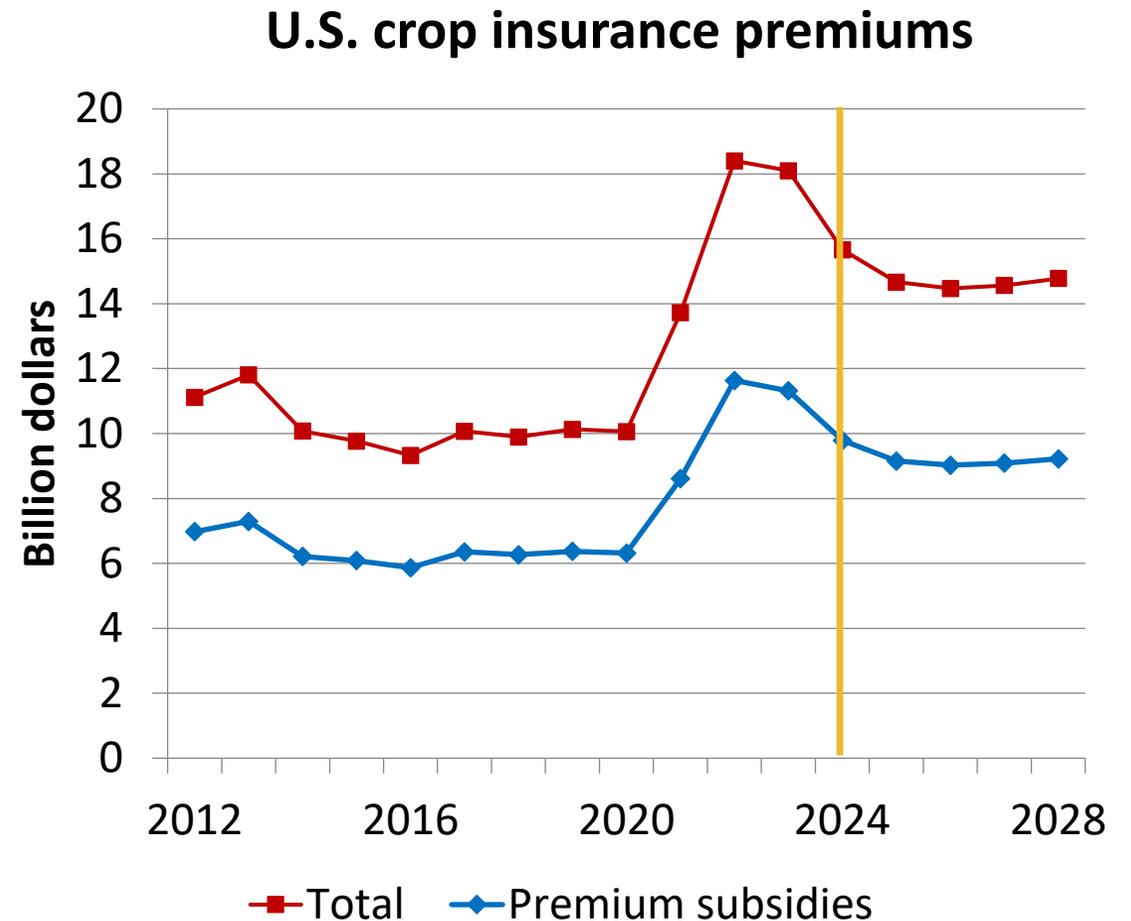
# U.S. government spending on farm programs

- The baseline assumes current policy
  - Continues 2018 farm bill programs indefinitely
  - Does not assume new ad hoc spending
- Farm bill implications
  - Similar Congressional Budget Office baseline is official point of comparison
  - Unresolved question: What will the budgetary target be?



# Crop insurance premiums and subsidies

- Premiums, subsidies have jumped
  - Higher crop prices
  - Increased coverage (e.g., pasture & rangeland)
- Premiums may retreat, but above pre-2021
  - Lower projected prices (small bump to price volatility) reduce premiums
- Total taxpayer costs projected to average about \$9.3 bil./yr. after 2024
  - Premium subsidies
  - Delivery costs, underwriting gains



# 2018 farm bill: 10-year CBO “score”

(change in federal spending vs. baseline that continued 2014 bill)

Provision	10-year total change in outlays, million dollars
Title I. Commodities (PLC, ARC, dairy program and more)	+263
Title II. Conservation (CRP, CSP, EQIP and more)	-6
Title III. Trade (market development programs and more)	+470
Title IV. Nutrition (primarily SNAP)	0
Title VI. Rural Development (mostly lower interest on RUS “cushion of credit”)	-2,530
Title VII. Research & Extension (organic research and more)	+615
Title X. Horticulture (mostly Local Agriculture Market Program)	+500
Title XI. Crop insurance	-104
All other titles	+792
<b>Net effect of the entire bill on the federal deficit over FY 2019 to FY 2028</b>	<b>0</b>

Source: CBO letter to Chairman Conaway, Dec. 11, 2018.

Note: The letter estimates total 10-year outlays of **\$867 billion**.

# Suppose reference prices increase by 10%: Impacts over the next ten years

	Average increase in PLC payments/base acre/yr.	10-year cumulative increase in government spending
Corn	\$12	\$5,149 million
Soybeans	\$6	\$331 million
Wheat	\$7	\$2,820 million
Cotton	\$28	\$2,955 million
Rice	\$38	\$1,282 million
Peanuts	\$81	\$1,677 million
<b>All program crops</b>		<b>\$15,169 million</b>

# What's next on the farm bill?

- Honest answer: I have no confidence in any answer I might give
- Some considerations
  - Does not appear to be any “new money” available
  - Odds of shifting funds across titles (e.g., from nutrition to Title 1 commodity programs) appear slim in a bill that can pass House AND Senate (though, some possible IRA conservation funding to commodity programs, or some suggest CCC?)
  - Almost everything people might want to do would cost money
  - Reportedly, House mark up will include something for reference price increases
  - “Permanent law” provisions kick in for dairy in January 2025 and later in the spring 2025 for program crops—pressure for a new farm bill now likely to hang over until late this spring on the very optimistic side or the ‘lame duck session 2024’ on the moderately optimistic side

# Thanks!

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*This material is based upon work supported by the U.S. Department of Agriculture, Office of the Chief Economist, under Agreement #58-0111-23-014, and the USDA National Institute of Food and Agriculture, Hatch project number MO-C1537173. Any opinion, findings, conclusions, or recommendations expressed in this publication are those of the authors and do not necessarily reflect the view of the U.S. Department of Agriculture nor the University of Missouri.*



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