Prices, Costs, and Profitability: Where are Markets Headed and How Can Risk be Mitigated

January 31, 2023

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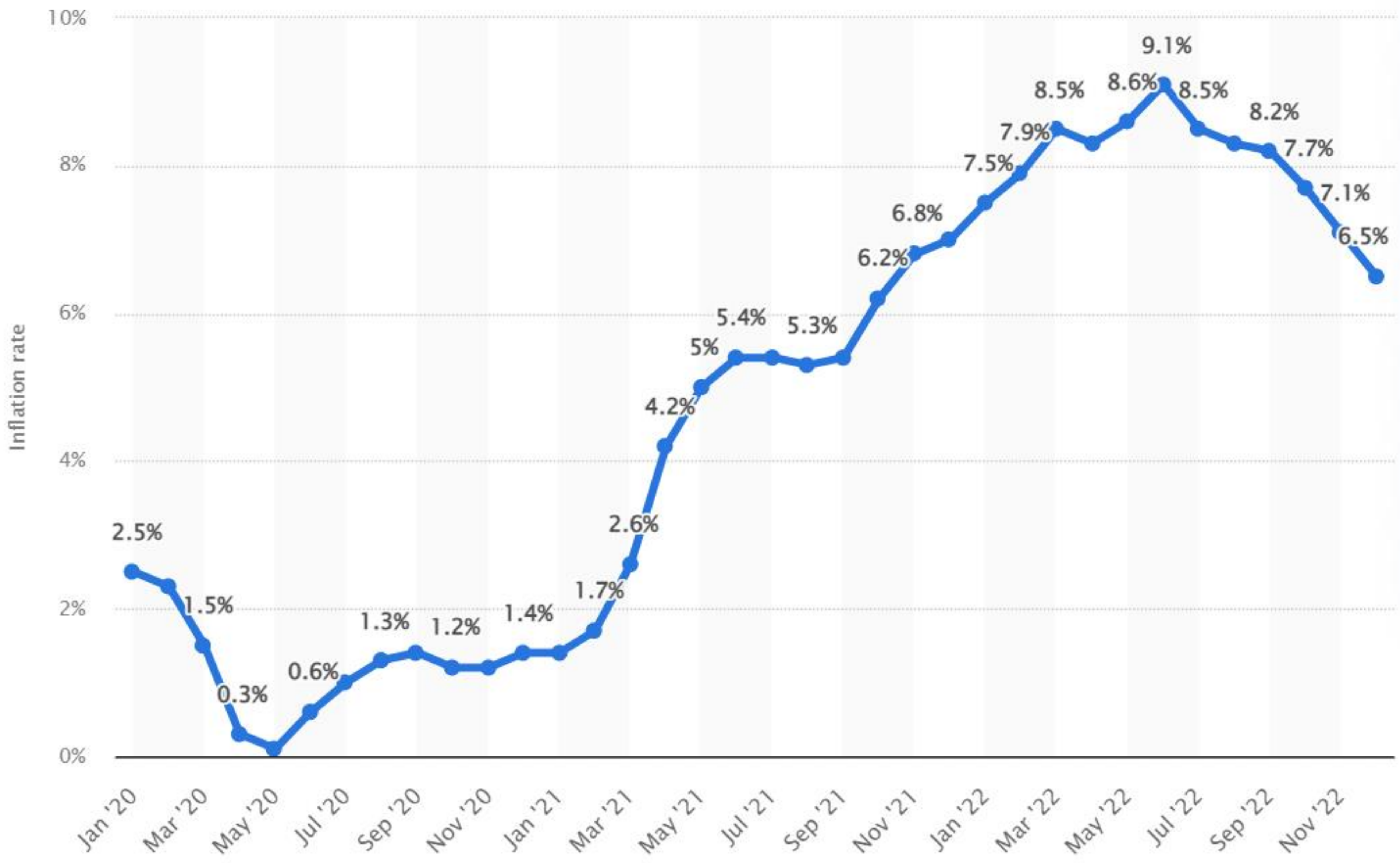
Overview

- Input Costs
- Corn and Soybean Prices
- Profitability
- Marketing and Risk Management

Monthly Inflation Rate 2020-2022



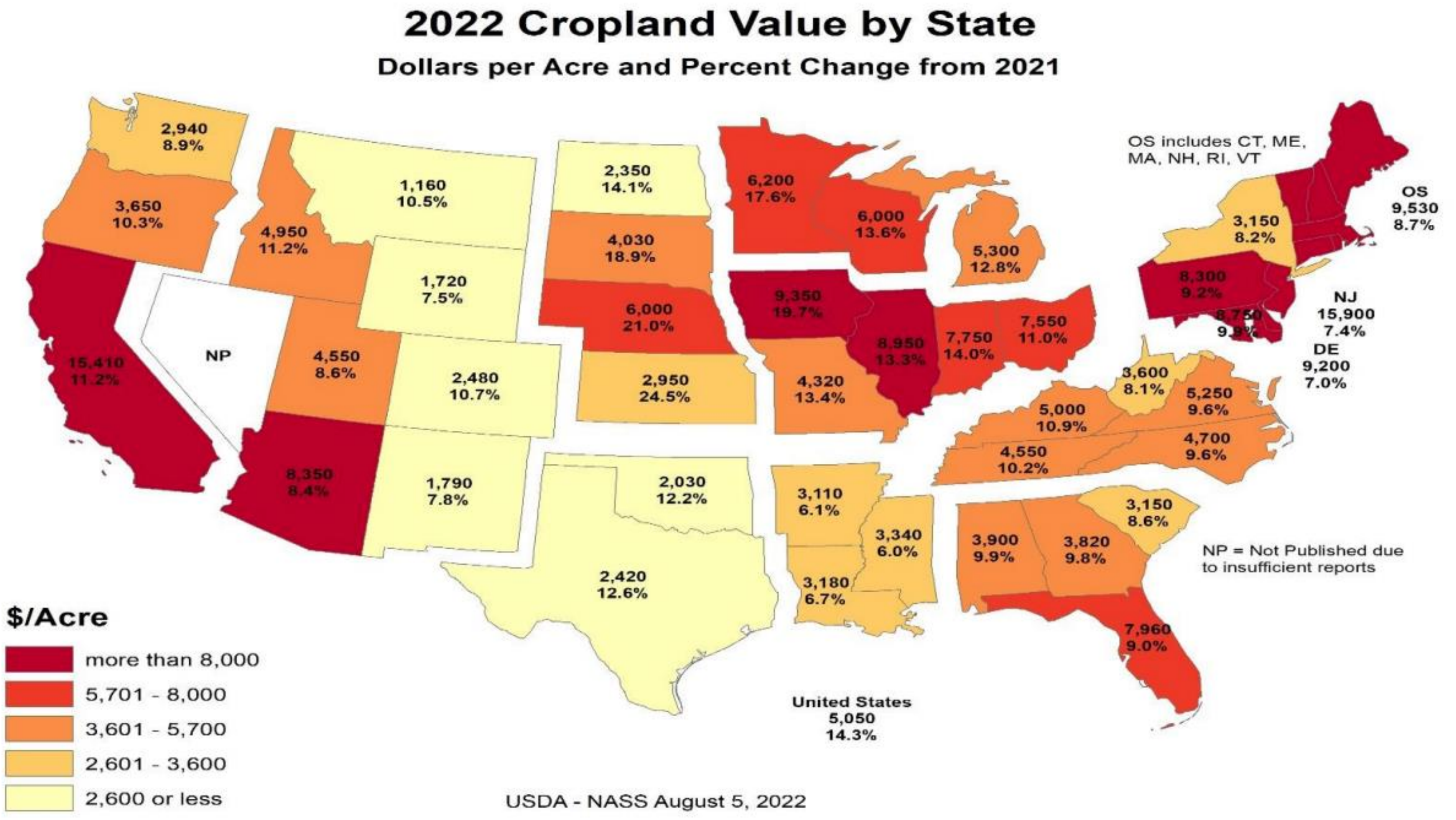
Source: https://www.statista.com/statistics

Inputs Prices

- Land prices and rents are up.
- Prices for most crop protection products and fertilizers are down from highs but remain elevated relative to 2020.
- Interest rates are up substantially.
- Diesel fuel and machinery cost is up.
- Labor and trucking shortages.

- **Will prices be cheaper between now and planting?**

Land and Cash Rental Rates

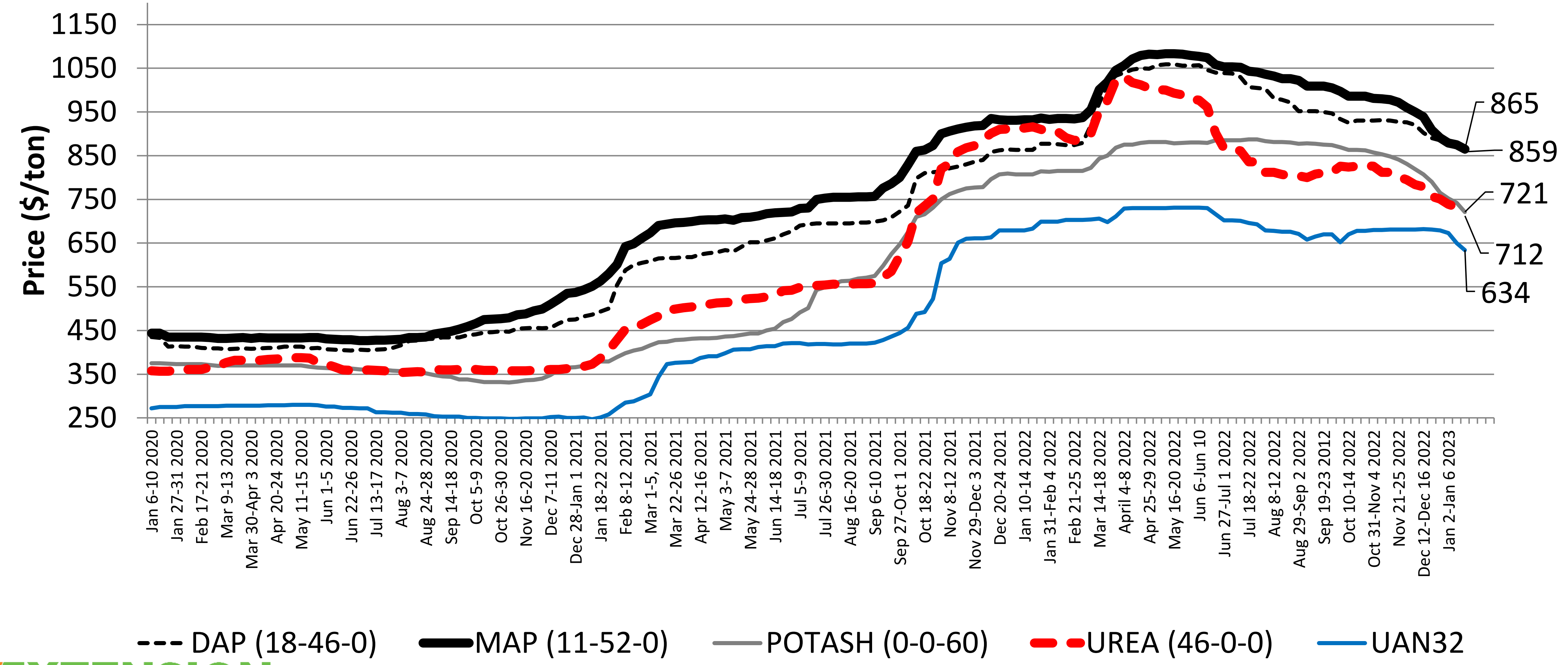


Land Values 2022 Summary (August 2022)
USDA, National Agricultural Statistics Service

In Tennessee, cropland cash rents averaged **$111/acre ($21/acre to $187/acre**). NASS.

¼ share:
Corn: 175 bu/acre at $6.00/bu ~ **$262/acre**
Soybeans: 50 bu/acre at $14.00 ~ **$175/acre**

Select Fertilizer Prices, 2020-2023



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Bank Prime Loan Rate

Current Bank Prime Rate 7.5%

Up 4.25% in 2022

0.25-0.75% potential increase in Q1 2023

Possible reductions 4th quarter 2023 or 2024

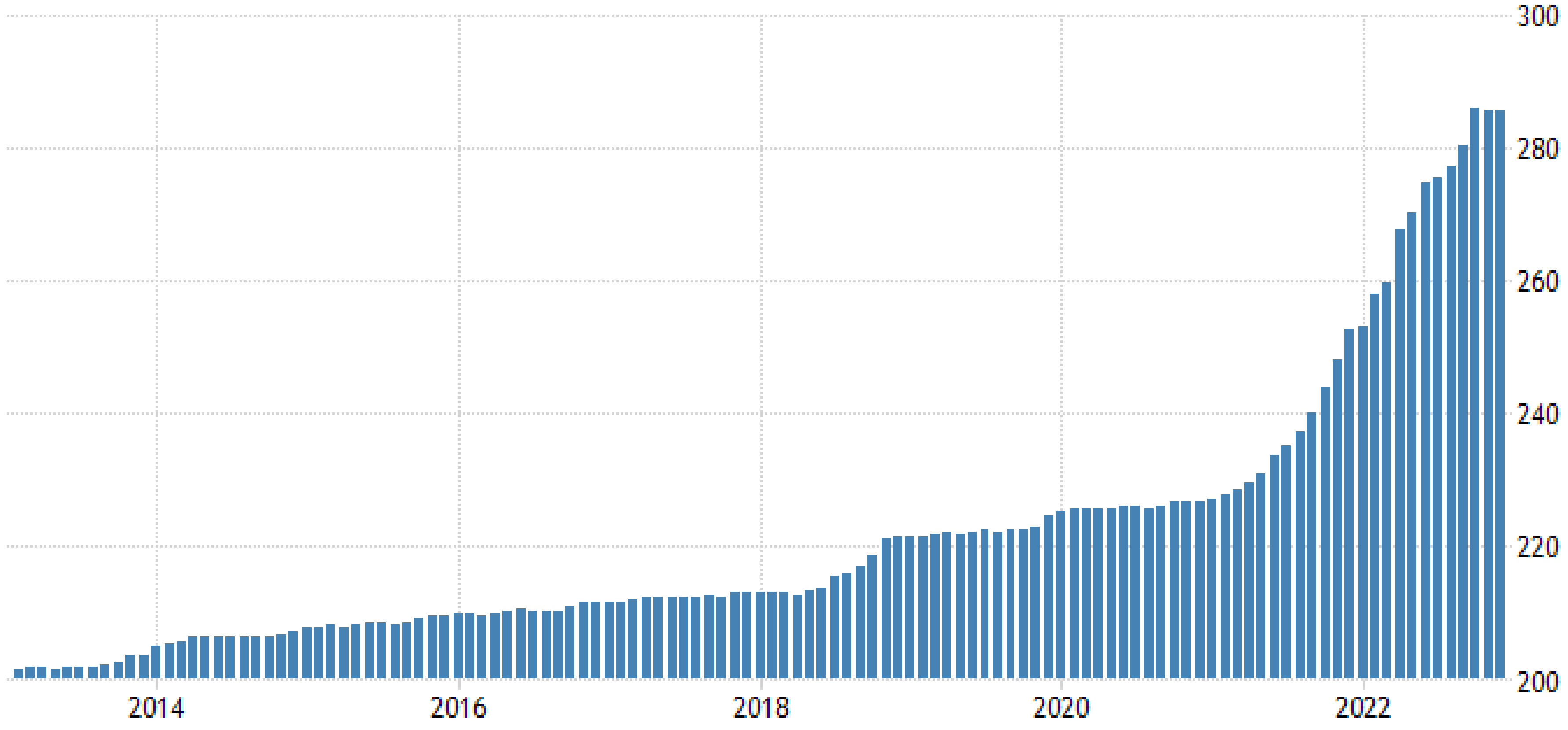
Source: https://fred.stlouisfed.org/series/DPRIME

Rising interest rates will cost you money

	$1,250,000 Operating Utilization		
Interest Rate	3.25%	5.5%	7.5%
Interest	$40,750	$68,750	$93,750
Change	-	$28,000	$53,000
Increase ($/acre)	-	$11.20	$21.20

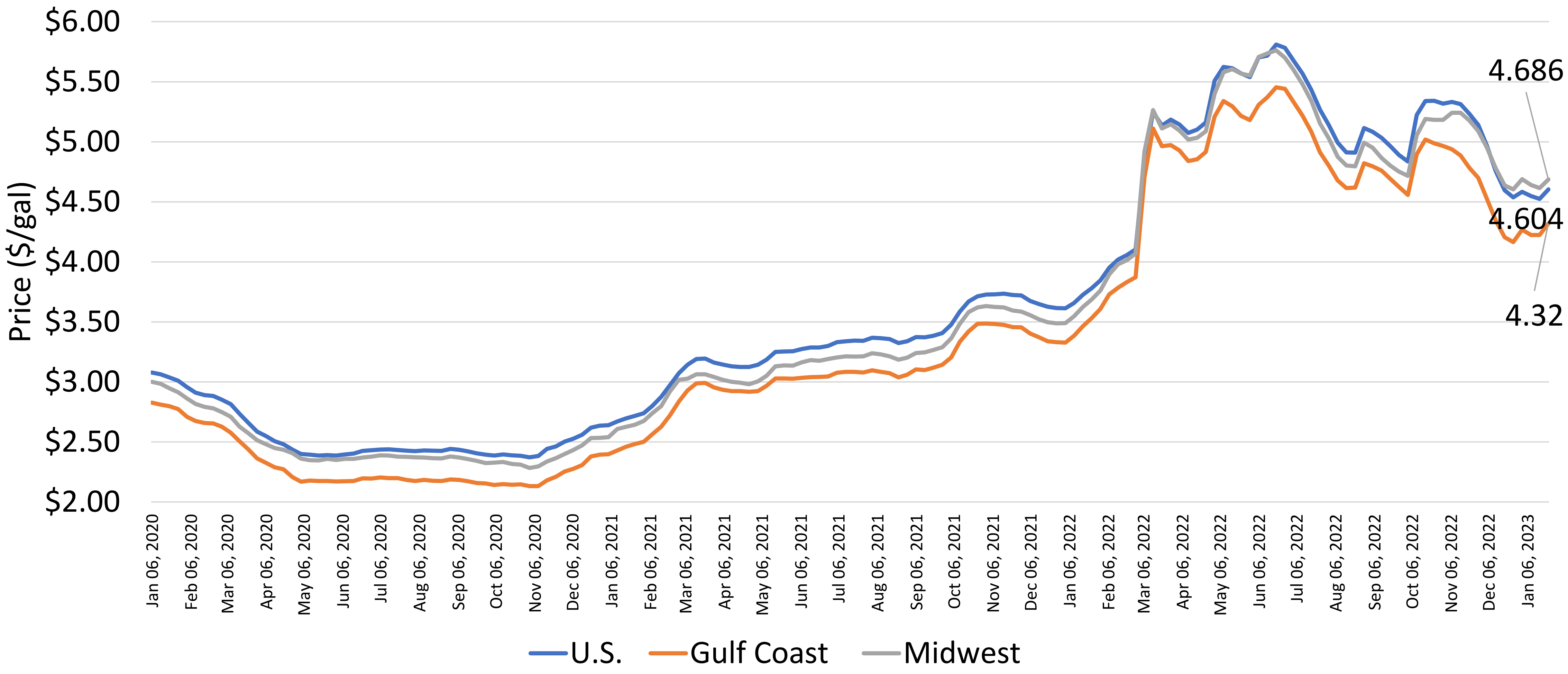
Assumptions: 2,500 acres.

Producer Price Index by Industry: Farm Machinery and Equipment Manufacturing was 285.735 Index Dec 1982=100 in December of 2022



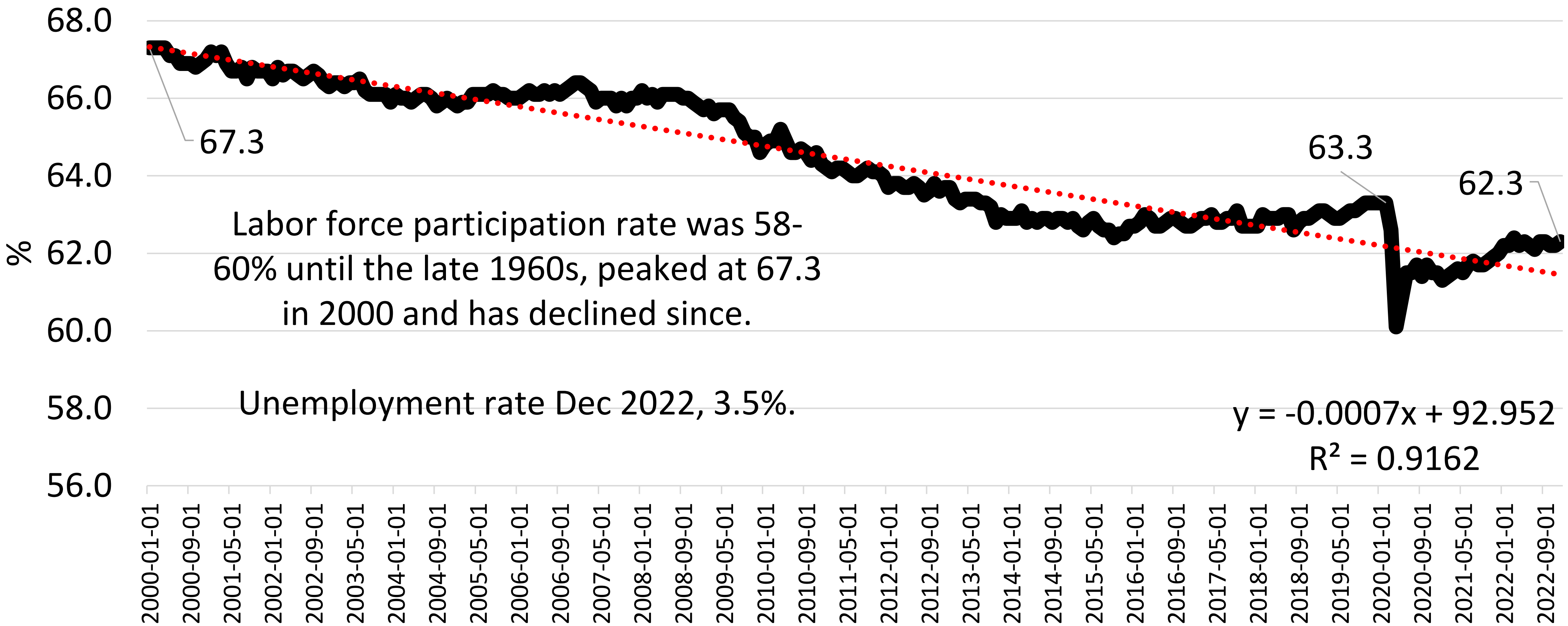
Farm machinery in December 2022 was up ~ 30% compared to 2020.

Weekly Retail No 2 Diesel Prices ($/gal), 2020-2023



Data Source: https://www.eia.gov/petroleum/gasdiesel/

U.S. Labor Force Participation Rate, 2000-2022



Source: https://fred.stlouisfed.org/series/CIVPART

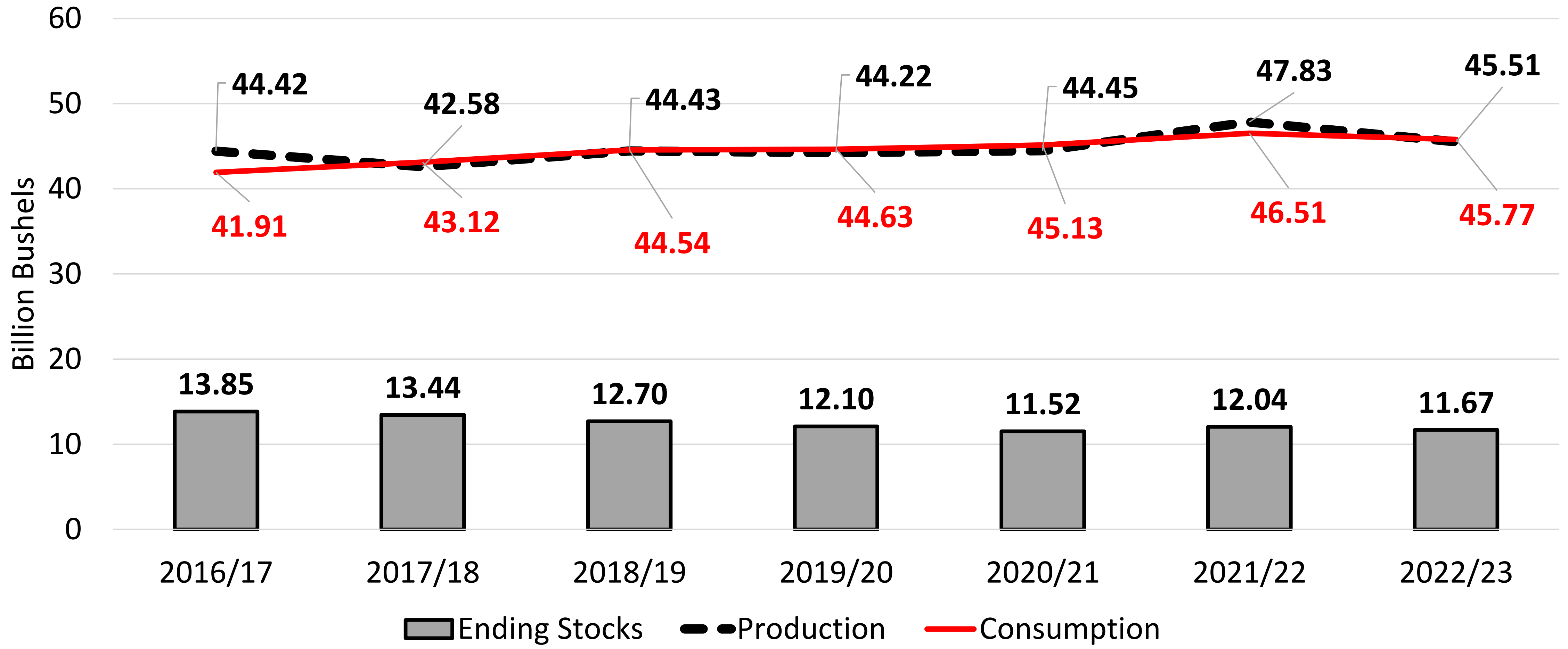
Reducing Input Costs

- Soil testing – know what you have.
- Alternative nutrient sources – poultry litter, manure, other.
- Eliminate products that are not contributing to sufficient yield gains relative to costs.
  - Max returns to N.
- Evaluate financing alternatives.
- Crop rotation.
  - High input cost versus low input cost commodities.
  - Profitability comparison and mange price risk.
- Crop share leases versus cash rent – balance the risk/reward.

Corn and Soybeans

SUPPLY AND DEMAND

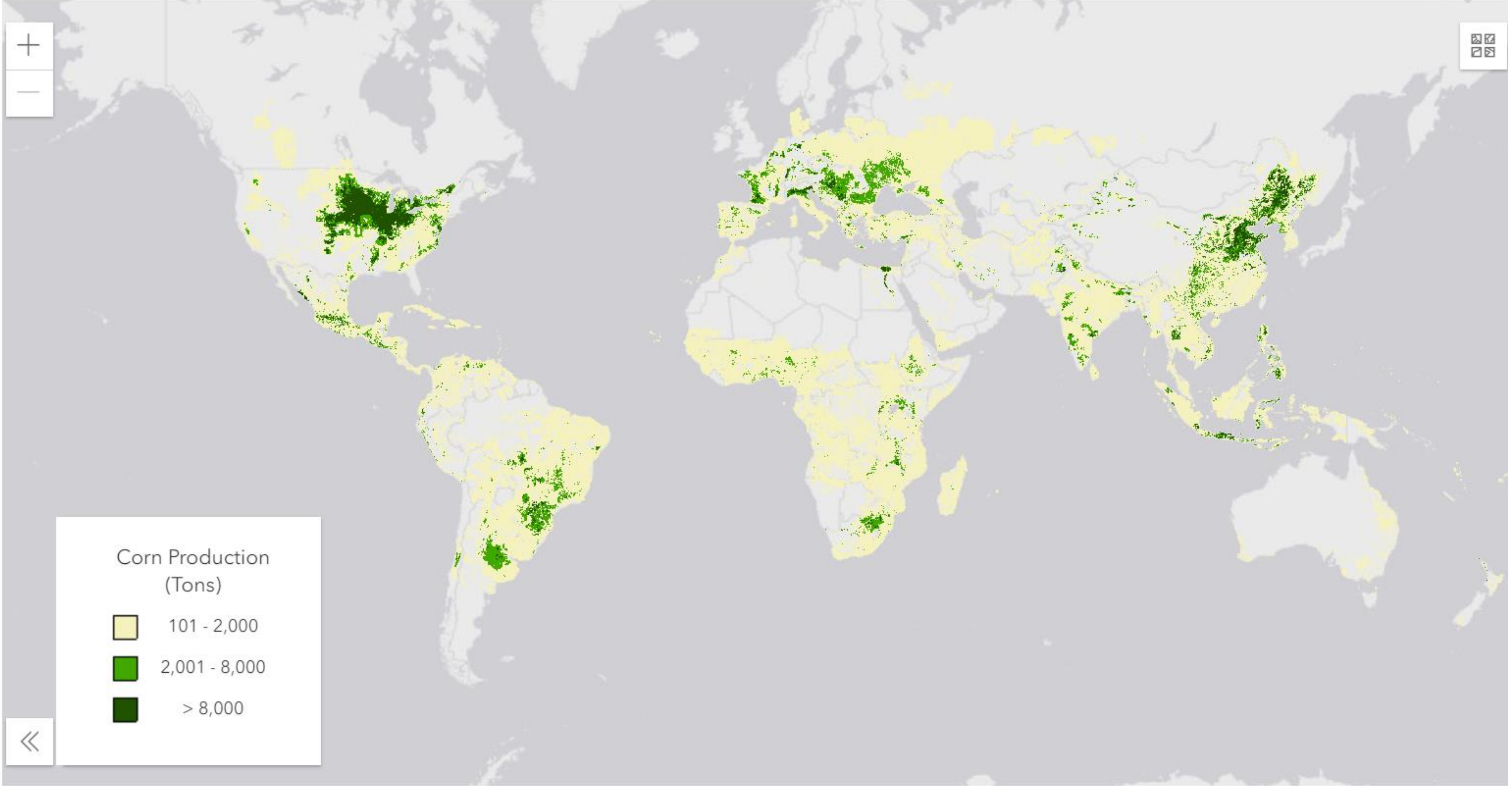
Global Corn Production, Consumption, and Ending Stocks, 2016/17 to 2022/23



Data Source: https://apps.fas.usda.gov/psdonline/app/index.html#/app/advQuery

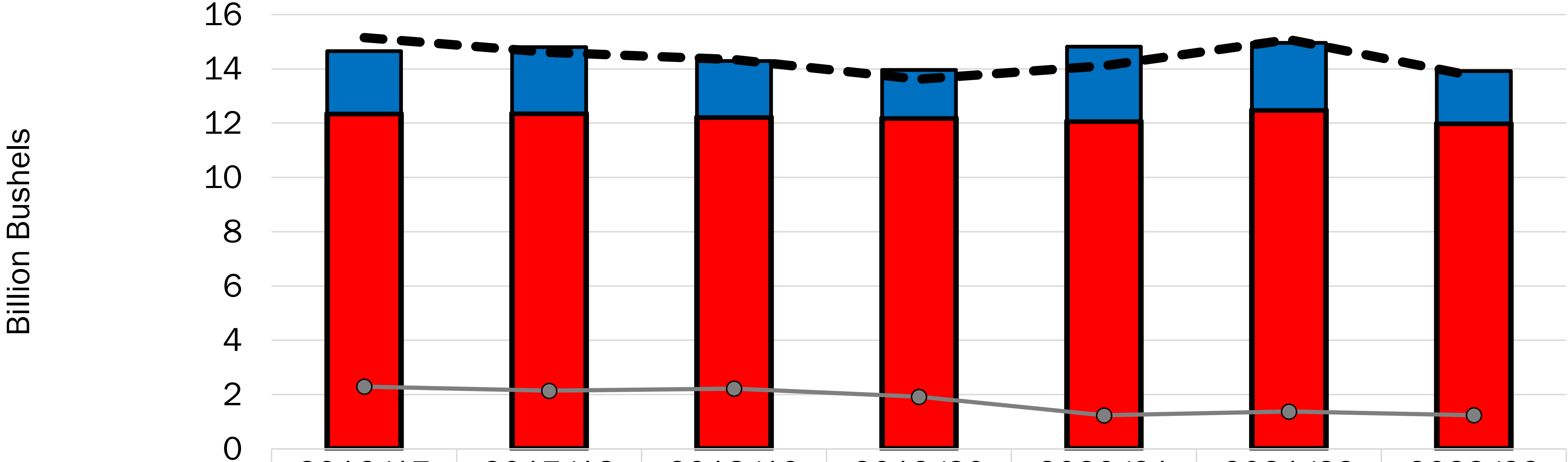
Global Corn Production

Corn Map Explorer



Source: https://ipad.fas.usda.gov/cropexplorer/cropview/commodityView.aspx?cropid=0440000

U.S. Corn Production, Consumption, Exports, Ending Stocks, 2016/17 to 2022/23



	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23
Exports	2.30	2.44	2.07	1.78	2.75	2.47	1.92
Consumption	12.35	12.36	12.22	12.18	12.07	12.48	11.99
Production	15.15	14.61	14.34	13.62	14.11	15.07	13.73
Ending Stocks	2.29	2.14	2.22	1.92	1.23	1.38	1.24

Data Source: https://apps.fas.usda.gov/psdonline/app/index.html#/app/advQuery

U.S. Corn, 2021 & 2022

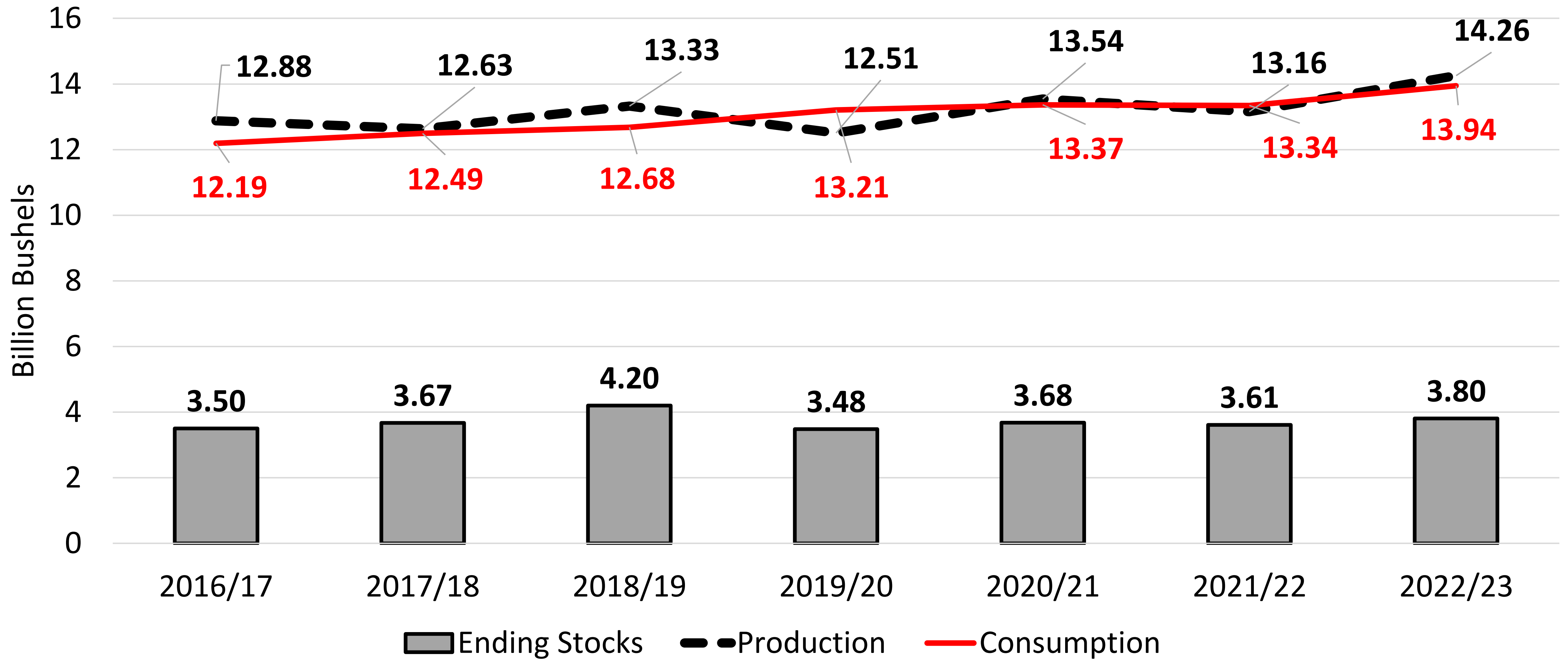
	2021/22	2022/23 Projected	2022/23-2021/22
Planted (Million)	93.3	**88.6**	-4.7
Harvested (Million)	85.3	**79.2**	-6.1
U.S. Avg. Yield (Bu/Acre)	176.7	**173.3**	-3.4
Beg. Stocks	1,235	**1,377**	142
Production	**15,074**	**13,730**	**-1,344**
Imports	24	**50**	26
Total Supply	16,333	**15,157**	-1,176
Feed and Residual	5,718	**5,275**	-443
Ethanol	5,326	**5,275**	-51
Food, Seed & Industrial	1,440	**1,440**	0
Exports	**2,471**	**1,925**	**-546**
Total Use	14,956	**13,915**	-1,041
U.S. Ending Stocks	**1,377**	**1,242**	**-135**
Foreign Stocks	**10,668**	**10,428**	**-240**
U.S. Avg. Season Price ($/Bu)	**$6.00**	**$6.70**	**$0.70**
U.S. Stocks/Use	**9.21%**	**8.93%**	**-0.28%**

Data Source: https://apps.fas.usda.gov/psdonline/app/index.html#/app/advQuery

Corn Supply and Demand

- Russia's invasion of Ukraine continues to influence grain, energy, and fertilizer markets.
- Global economic forces continue to exert a strong influence in agricultural markets.
- U.S. ending stocks are lower than last year with stocks-to-use projected at 9%.
- Projected planted acreage in 2023?

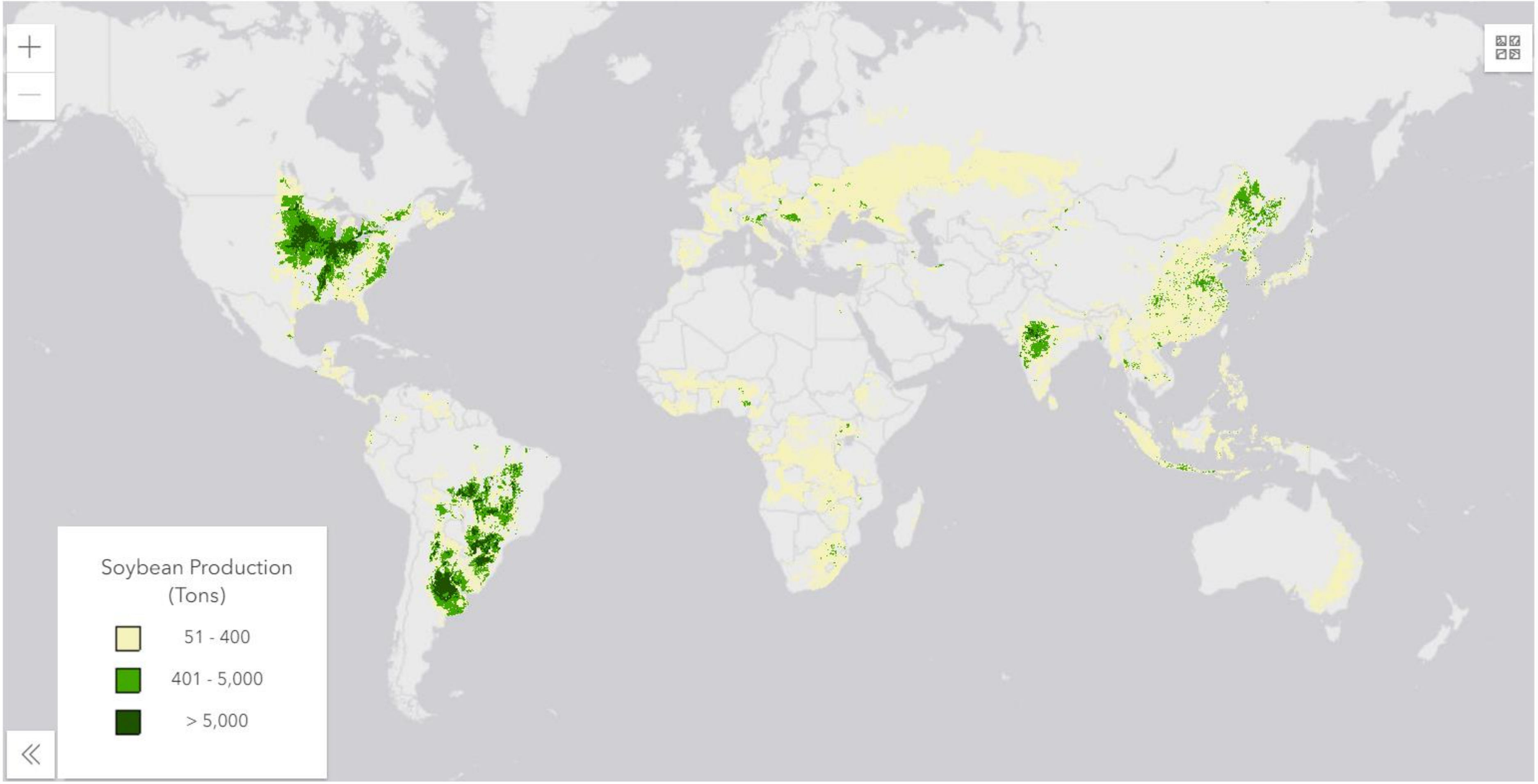
Global Soybeans Production, Consumption, and Ending Stocks, 2016/17 to 2022/23



Data Source: https://apps.fas.usda.gov/psdonline/app/index.html#/app/advQuery

Global Soybean Production

Soybean Map Explorer



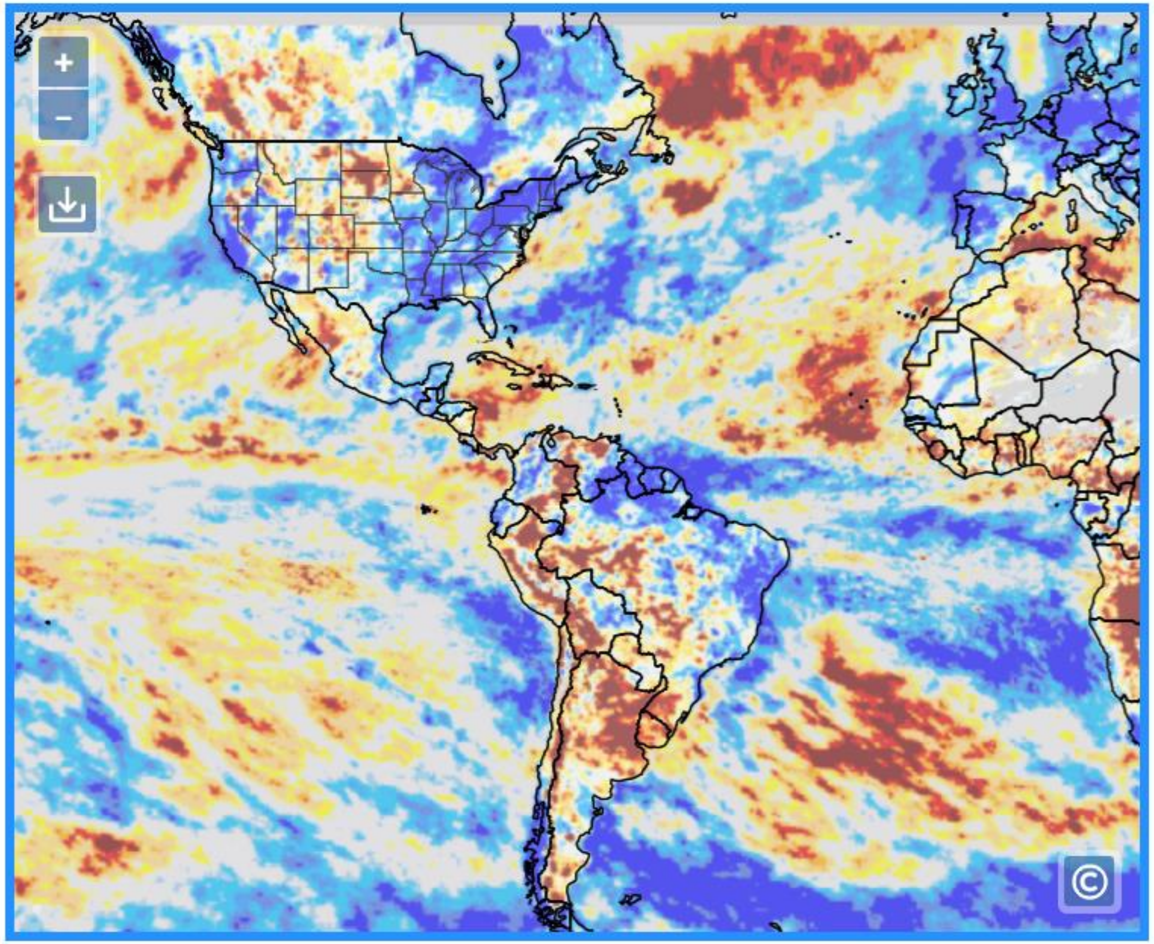
Source: https://ipad.fas.usda.gov/cropexplorer/cropview/commodityView.aspx?cropid=0440000

Global Drought Conditions

Daily SPI (CMORPH) | **Monthly SPI (GPCC)** | **Vegetation Health Index**

CMORPH (CPC MORPHing technique) produces global precipitation analyses at very high spatial and temporal resolution. This technique uses precipitation estimates that have been derived from low orbiter satellite microwave observations exclusively, and whose features are transported via spatial propagation information that is obtained entirely from geostationary satellite IR data.

This map shows the 3-month Standardized Precipitation Index (SPI) and is updated daily with a delay of 2-3 days. Learn more.



Drought Categories

D4	D3	D2	D1	D0

Wetness Categories

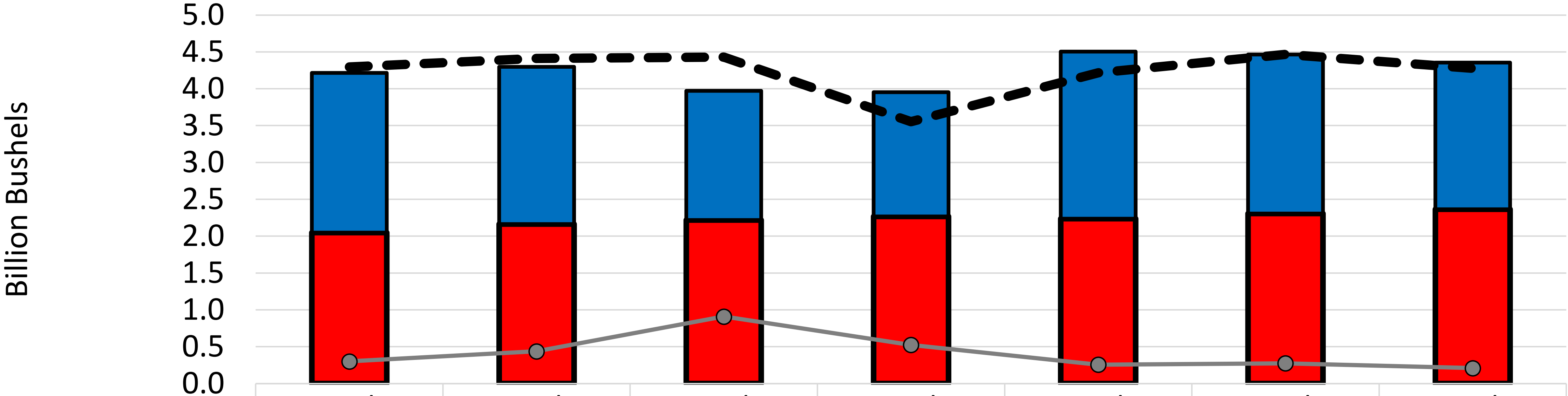
W0	W1	W2	W3	W4

Source(s): CPC

Updates Daily - 01/15/23

Source: https://www.drought.gov/international

U.S. Soybeans Production, Consumption, Exports, Ending Stocks, 2016/17 to 2022/23



	2016/17	2017/18	2018/19	2019/20	2020/21	2021/22	2022/23
Exports	2.17	2.13	1.75	1.68	2.27	2.16	1.99
Consumption	2.05	2.16	2.22	2.27	2.24	2.31	2.37
Production	4.30	4.41	4.43	3.55	4.22	4.47	4.28
Ending Stocks	0.30	0.44	0.91	0.52	0.26	0.27	0.21

Data Source: https://apps.fas.usda.gov/psdonline/app/index.html#/app/advQuery

U.S. Soybean, 2021 & 2022

	2021/22	2022/23 Projected	Change 2022/23-2021/22
Planted (Million)	87.2	**87.5**	0.3
Harvested (Million)	86.3	**86.3**	0.0
U.S. Avg. Yield (Bu/Acre)	51.7	**49.5**	-2.2
Beg. Stocks	257	**274**	17
Production	4,465	**4,276**	-189
Imports	16	**15**	-1
Total Supply	4,738	**4,566**	-172
Crushing	**2,204**	**2,245**	**41**
Exports	**2,158**	**1,990**	**-168**
Seed and Residual	103	**120**	17
Total Use	4,464	**4,355**	-109
U.S. Ending Stocks	**274**	**210**	**-64**
Foreign Stocks	**3,334**	**3,594**	**260**
U.S. Average Season Price ($/Bu)	**$13.30**	**$14.20**	**$0.90**
U.S. Stocks/Use	**6.14%**	**4.82%**	**-1.32%**

Data Source:
https://apps.fas.usda.gov/psdonline/app/index.html#/app/advQuery

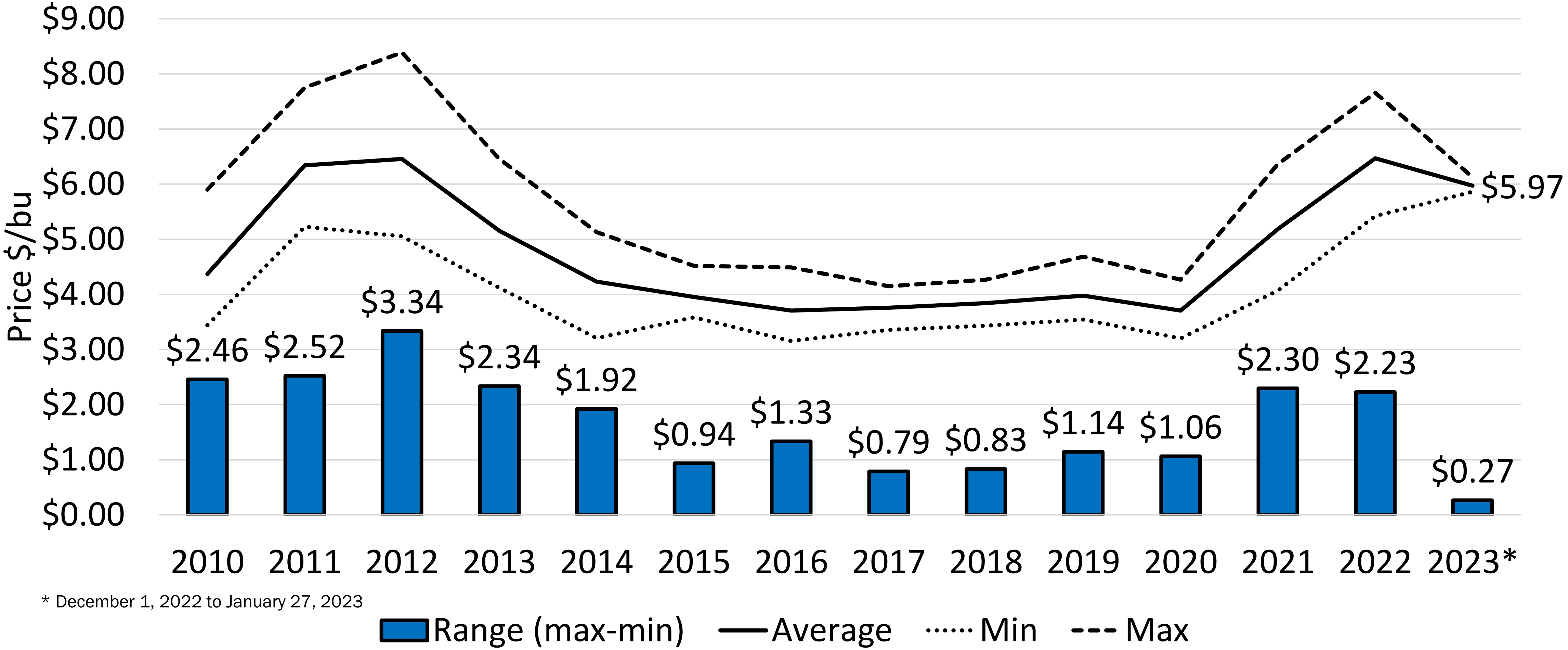
Soybean Supply and Demand

- South American production and exports.
- Global economic forces influence on agricultural markets in 2023.
- U.S. ending stocks are projected lower, global stocks project higher.
- Increased U.S. domestic crushing.
- Projected planted acreage in 2023?

Old Crop - New Crop

PRICES

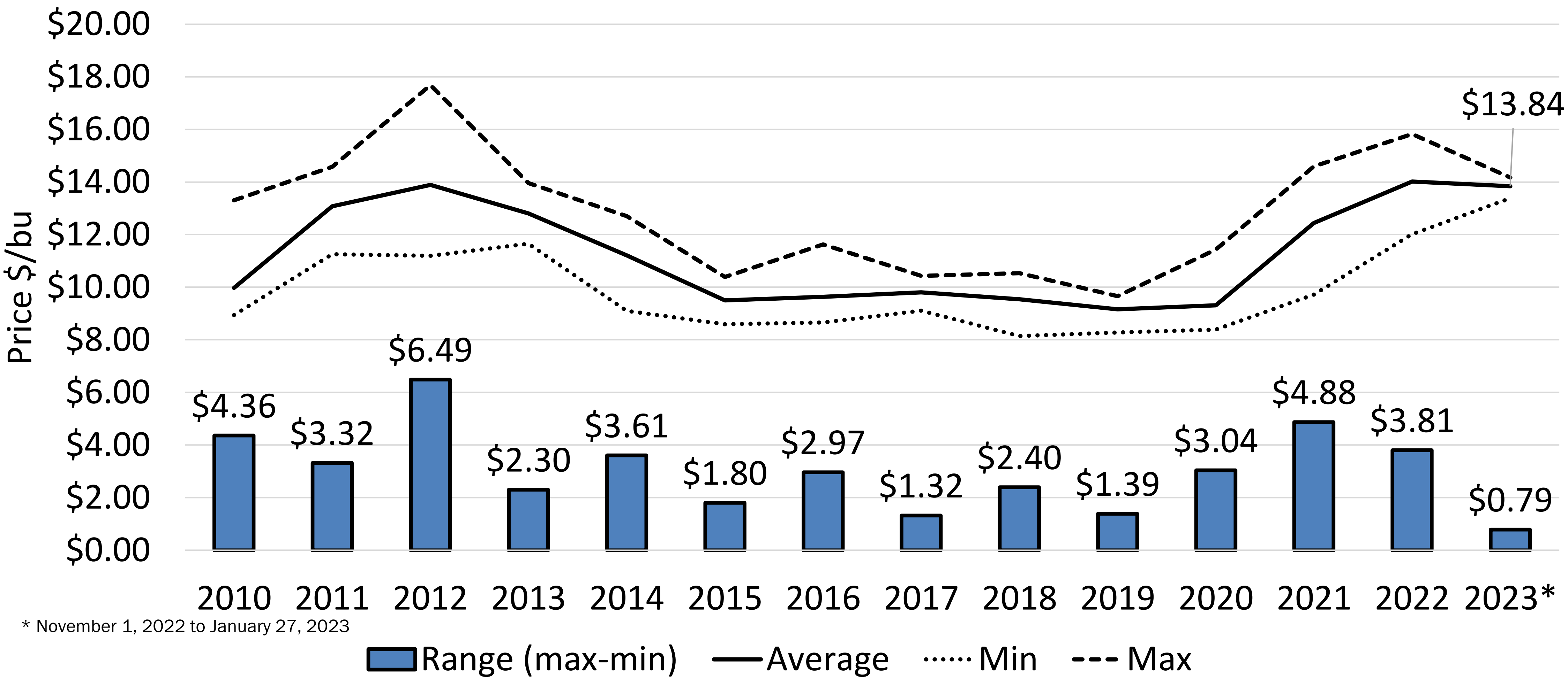
December Corn Futures Contract, Dec 1 to Expiration, 2010-2023*



* December 1, 2022 to January 27, 2023

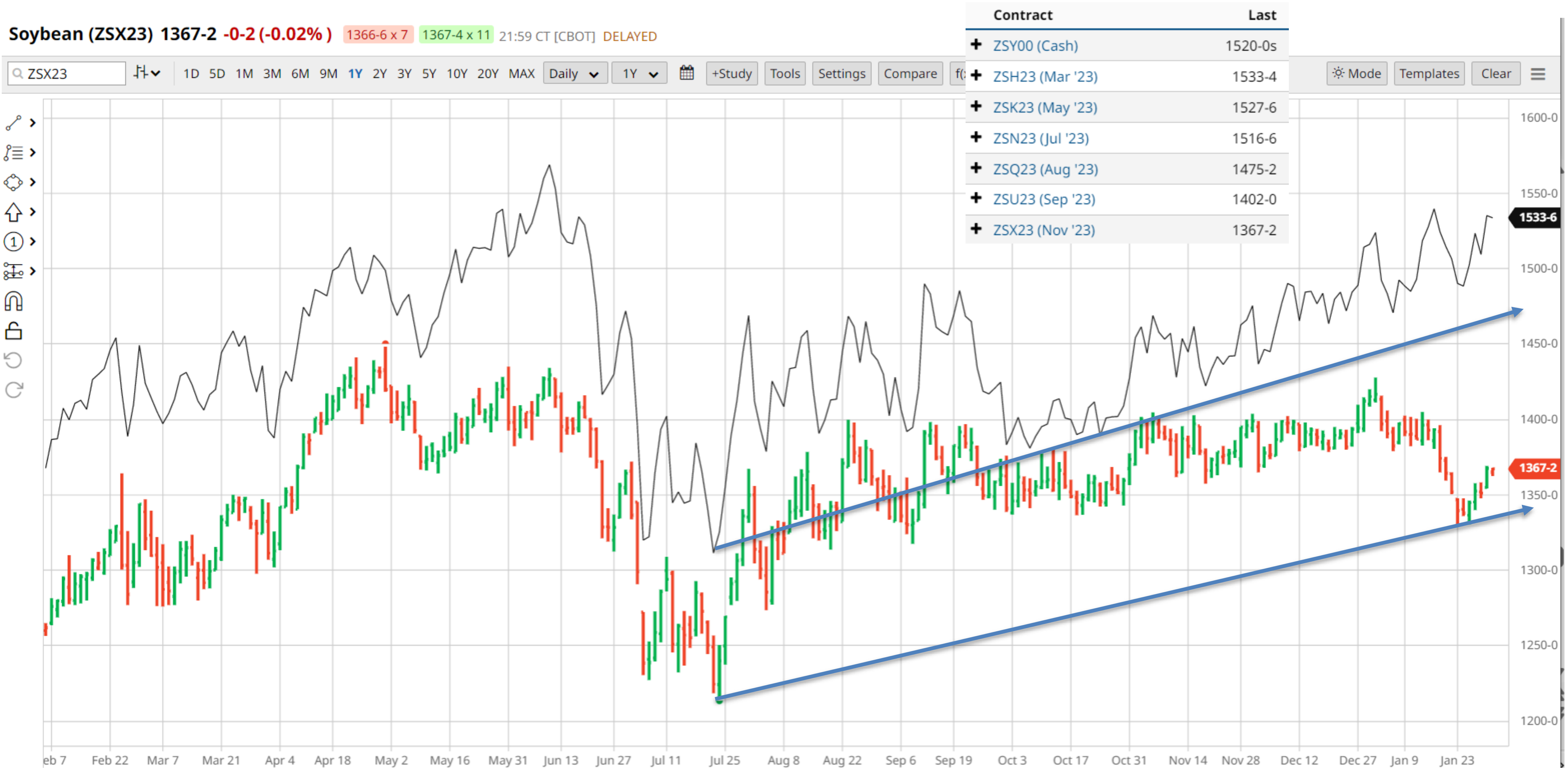
Corn March and December Futures Contract

November Soybean Futures Contract, Nov 1 to Expiration, 2010-2023*



* November 1, 2022 to January 27, 2023

Soybean March and November Futures Contract



Managing Price Risk In 2023

- High cost of production
- Volatile commodity prices
- Downside price risk

- Risk management tools need to be utilized this winter/spring to protect against price declines and avoid a potential margin squeeze.

Managing Price Risk

- Identify risk intervals and develop a marketing and risk management plan.

- Crop insurance protection.
- In season marketing.
- Storage.

- Price protection versus establishing a final price

Revenue		Quantity	Price	Total
		175	5.99	1,048.25
Total Revenue				1,048.25
Variable Expenses				
	Seed	32	3.60	115.20
	Fertilizer & Lime	1	243.00	243.00
	Chemical	1	64.79	64.79
	Crop Scout or Consultant	1	18.00	18.00
	Repair & Maintenance	1	43.89	43.89
	Fuel, Oil & Filter	1	29.80	29.80
	Operator Labor	1	13.98	13.98
	Crop Insurance	1	21.47	21.47
	Operating Interest	621	8%	24.05
Total Variable Expenses				**574.18**
Return Above Variable Expenses				474.07
Fixed Expenses				
	Machinery			
	Capital Recovery	1	120.73	120.73
	General Overhead	1	20	20.00
	Cash Rent	1	120	120.00
	Management Labor	1	25	25.00
Total Fixed Expenses				**285.73**
Total Expenses				**859.92**
Return Above Specified Expenses				**188.33**

2023 Corn Cost of Production

What's your projected cost of production?

Track actual versus budgeted.

Use your budget and actual expenses top guide risk management and marketing decisions.

Corn - Net Return Table ($/acre); $860/acre Cost of Production

Yield (bu/acre)

Price ($/bu)	120	130	140	150	160	170	180	190	200	210	220	230
4.00	(380)	(340)	(300)	(260)	(220)	(180)	(140)	(100)	(60)	(20)	20	60
4.25	(350)	(307)	(265)	(222)	(180)	(137)	(95)	(52)	(10)	33	75	118
4.50	(320)	(275)	(230)	(185)	(140)	(95)	(50)	(5)	40	85	130	175
4.75	(290)	(242)	(195)	(147)	(100)	(52)	(5)	43	90	138	185	233
5.00	(260)	(210)	(160)	(110)	(60)	(10)	40	90	140	190	240	290
5.25	(230)	(177)	(125)	(72)	(20)	33	85	138	190	243	295	348
5.50	(200)	(145)	(90)	(35)	20	75	130	185	240	295	350	405
5.75	(170)	(112)	(55)	3	60	118	175	233	290	348	405	463
6.00	(140)	(80)	(20)	40	100	160	220	280	340	400	460	520
6.25	(110)	(47)	15	78	140	203	265	328	390	453	515	578
6.50	(80)	(15)	50	115	180	245	310	375	440	505	570	635
6.75	(50)	18	85	153	220	288	355	423	490	558	625	693
7.00	(20)	50	120	190	260	330	400	470	540	610	680	750
7.25	10	83	155	228	300	373	445	518	590	663	735	808
7.50	40	115	190	265	340	415	490	565	640	715	790	865
7.75	70	148	225	303	380	458	535	613	690	768	845	923

How Many Bushels to Cover Select Expenses AT $4, $5, $6, and $7 Corn

Expense	Expense ($/acre)	$4.00	$5.00	$6.00	$7.00
Seed	$115.20	28.8	23.0	19.2	16.5
Fertilizer & Lime	$243.00	60.8	48.6	40.5	34.7
Chemical	$64.79	16.2	13.0	10.8	9.3
Variable Cost	$574.18	143.5	114.8	95.7	82.0
Fixed Cost	$285.73	71.4	57.1	47.6	40.8
Total Cost	$859.92	215.0	172.0	143.3	122.8

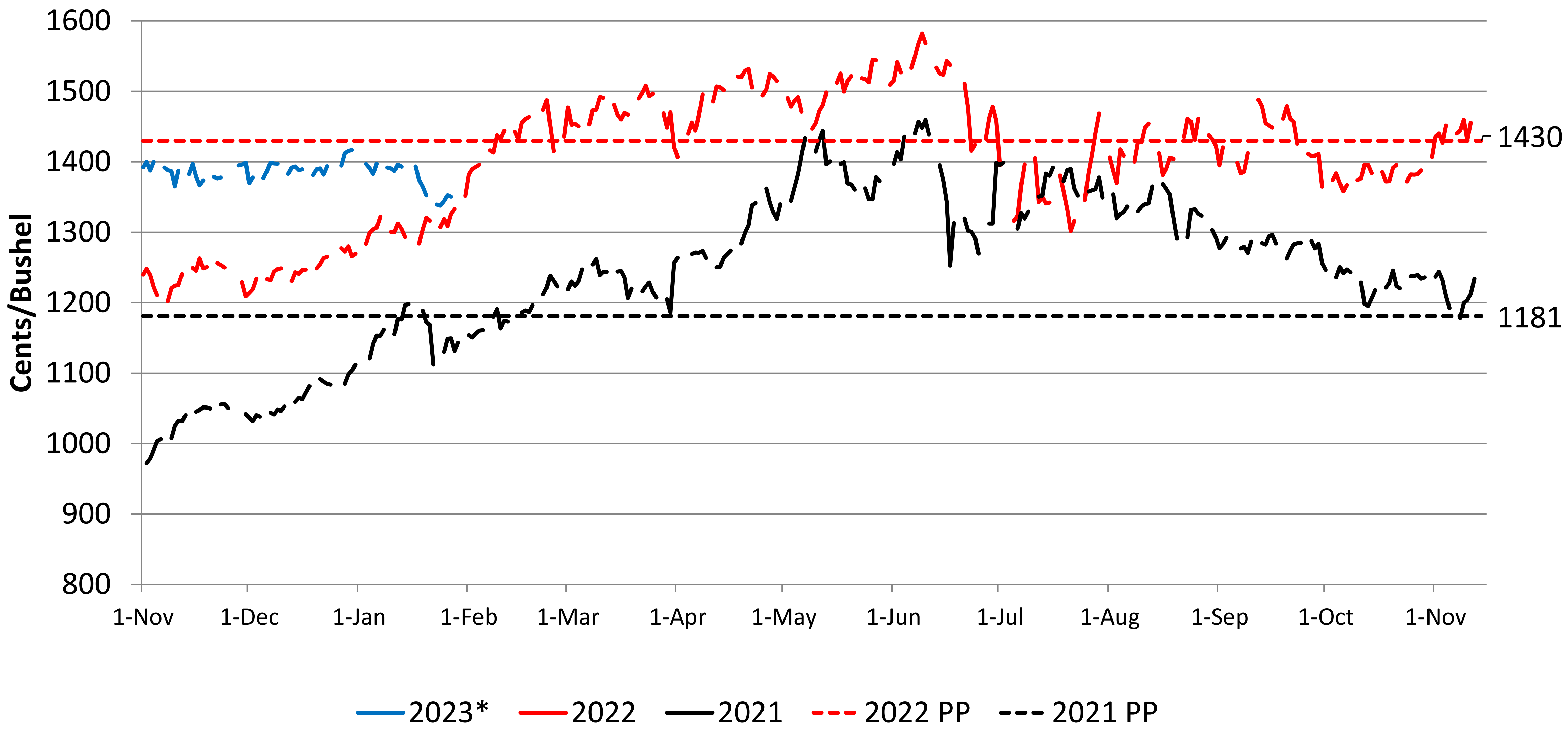
Breakeven production at:
$4.00 = 215 bushels
$5.00 = 172 bushels
$6.00 = 143 bushels
$7.00 = 123 bushels

Consider downside price protection when inputs are purchased.
Protect against a margin squeeze.

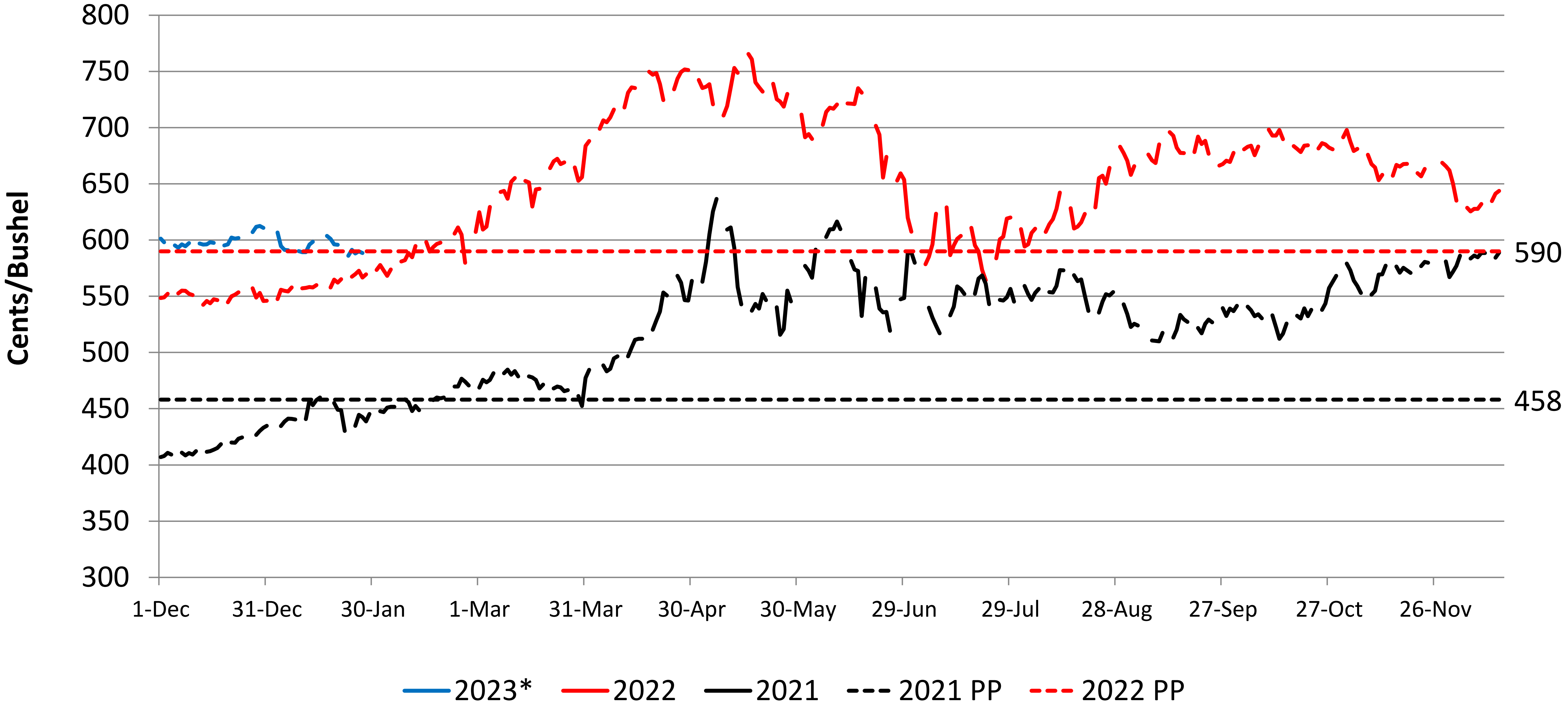
Example: Bridging the price risk gap until crop insurance prices are determined – put option

- On November 11, a $14.00 November 2023 Put Option cost $1.06.
- On January 27, a $14.00 November 2023 Put Option cost $1.09.
- After crop insurance prices are determined:
  - Out-of-the money: exit options position recoup premium.
  - In-the-money: maintain the position as price protection.

November Soybean Futures and Projected Price for Crop Insurance



December Corn Futures and Projected Price for Crop Insurance

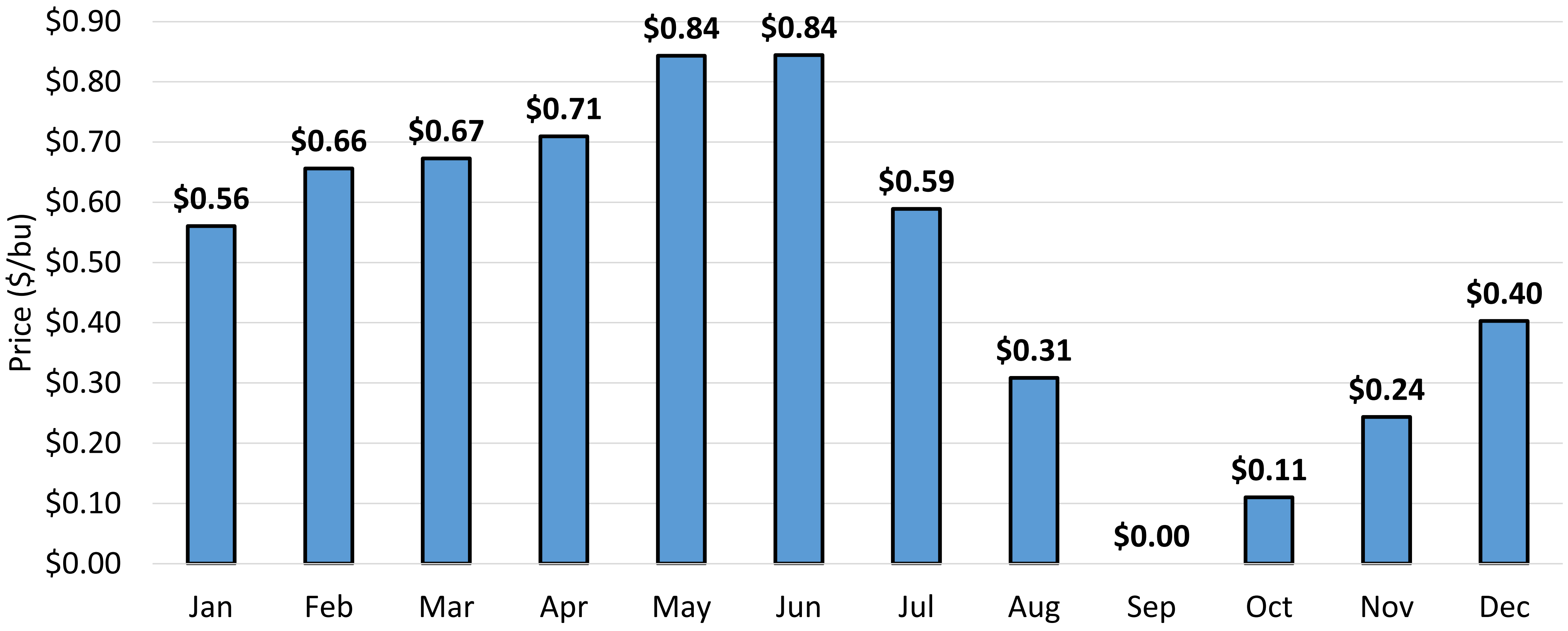


Breaking Down Price Risk

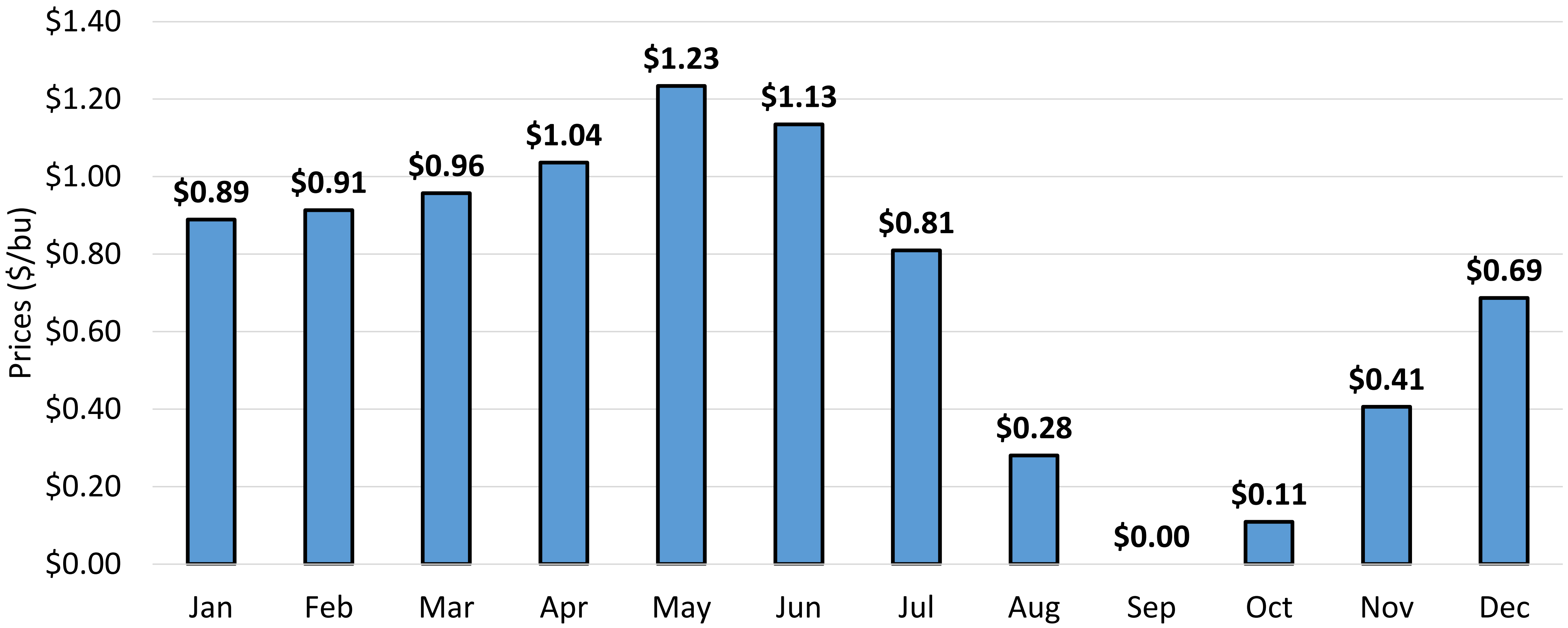
- Cash price for corn of $7.00
  - – $6.00 futures price (86% of price risk)
  - – $1.00 basis (14% of price risk)

- Buy a $5.50 December Put Option for 30 cents setting a $5.20 futures floor.
- This removes 87% ($5.20/$6.00) of the futures price risk (74% of total price).
- Leaves the upside open in futures markets and the flexibility to set basis at a later date.

Tennessee Corn 10-Yr Average Improvement in Cash Prices at Elevators and Barge Points



Tennessee Soybean 10-Yr Average Improvement in Cash Prices at Elevators and Barge Points



Take Home Message

- The general economy has warning signs for 2023-2024.
- Cost of production remains elevated compared to previous years.
- Global events strongly affect markets.
- Corn and soybean price volatility is likely to persist in 2023.
- Crop insurance + price risk management + storage.

January 31, 2023
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THANK YOU