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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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U.S. crop trade figures reported here were prepared with the help of teams led by Malieka Bordigioni (maliekal@unr.edu) at the University of Nevada, Reno; Alvaro Durand-Morat (adurand@uark.edu) at the University of Arkansas; and Darren Hudson (darren.hudson@ttu.edu) at Texas Tech University.

The Agricultural and Food Policy Center at Texas A&M University will prepare a companion set of estimates of the farm-level impacts of these projections (www.afpc.tamu.edu).

The authors would like to thank participants in a workshop reviewing a preliminary version of these estimates in Washington, D.C., in December 2022. Any remaining errors are those of the authors. Some of the authors of this publication may be involved in consulting relationships related to this topic. Julian Binfield and Patrick Westhoff have a consulting relationship with GAM LLC unrelated to this publication.

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Summary

Unfavorable weather, the Russian invasion of Ukraine, avian influenza and a host of other factors resulted in high commodity prices, high farm production costs and high consumer food price inflation in 2022. An assumed return to more normal conditions results in projected declines in commodity prices, farm income and food price inflation.

This report summarizes baseline projections for agricultural and biofuel markets prepared using market information available in January 2023. Based on forecasts by S&P Global, U.S. and world economic growth slows in 2023 and consumer price inflation drops back to 2% by 2024. The baseline reflects current policies, meaning it incorporates programs that had been enacted prior to January 2023, but does not reflect any subsequent policy changes. The baseline is intended to serve as a reasonable point of reference for evaluating alternative scenarios; it is not a prediction of future policy choices.

We use our models to develop a range of projected market outcomes that takes into account some major sources of uncertainty about future supply and demand conditions. In some of the resulting 500 outcomes, prices, quantities and values are much higher or much lower than the averages reported here.

Some key results:

- Prices for many crops have been at or near record nominal levels in the 2022/23 marketing year. Unfavorable weather reduced crop production in the United States, the Russian invasion of Ukraine limited exports by a major competitor in world markets, and world economic growth supported demand.

- If weather conditions allow crop yields to return to trend-line levels in 2023, prices for corn, soybeans, wheat, cotton and many other crops are likely to fall. Over the next 10 years, average nominal prices are much lower than they have been in 2022/23, but they remain above the average of 2017/18 to 2021/22.

- Higher fertilizer, fuel and feed costs contributed to a very sharp increase in farm production expenses in 2022. A smaller increase is projected in 2023, and lower prices for some inputs result in a reduction in production costs in 2024 and 2025.

- Cattle, hog, poultry and milk prices all increased in 2022. High feed costs, drought and avian influenza limited supplies, and consumer demand generally continued to be strong. In 2023, most projected livestock sector prices fall as supplies rebound and demand growth slows. The one major exception is cattle, where drought and other factors limit the number of animals available for slaughter.

- Federal spending on farm-related programs was above the historical norm between 2019 and 2022, largely because of short-term, ad hoc programs. This current policy baseline does not assume new ad hoc programs in the future, and projected farm-related outlays decline in fiscal years (FY) 2023 and 2024.

- Crop losses in 2022 result in high budgetary costs for the crop insurance program in fiscal year 2023. Crop insurance accounts for 45% of projected spending on major farm-related programs over the next decade. Commodity program spending associated with Title I of the farm bill is relatively low in FY 2023 and 2024 but rebounds in later years given projected changes in commodity prices and program payment triggers under the price loss coverage (PLC) and agriculture risk coverage (ARC) programs.

- Net farm income reached a record level in nominal terms in 2022, as sharply higher crop and livestock receipts more than offset reduced government payments and increased production expenses. Projected net income declines in 2023 and 2024 as receipts and payments fall.

- Farm asset values have increased with land prices in recent years, and another increase is projected for 2023. Given assumptions of the outlook, lower farm income and high interest rates restrict further increases in farm real estate values in subsequent years.

- Consumer food price inflation jumped to 9.9% in 2022 as farm commodity prices rose, labor and other costs increased, supply chain problems continued, and consumer demand was strong. Price increases have slowed in recent months, and the projected annual increase in consumer food prices is 4.4% in 2023 and under 2% in 2024.

Key results

Marketing year	2017/18-2021/22 average	2022/23	2023/24	2024/25-2032/33 average
Crop prices				
Corn farm price, dollars per bushel	4.21	6.69	5.32	4.36
Soybean farm price, dollars per bushel	10.10	14.23	12.17	10.93
Wheat farm price, dollars per bushel	5.43	9.08	7.39	5.86
Upland cotton farm price, cents per pound	71.2	82.5	73.9	74.7
Selected program benefits, billion dollars				
Agriculture risk coverage	0.64	0.10	0.11	2.97
Price loss coverage	2.24	0.01	0.40	1.88
Crop insurance net indemnities	4.33	12.54	9.72	7.91

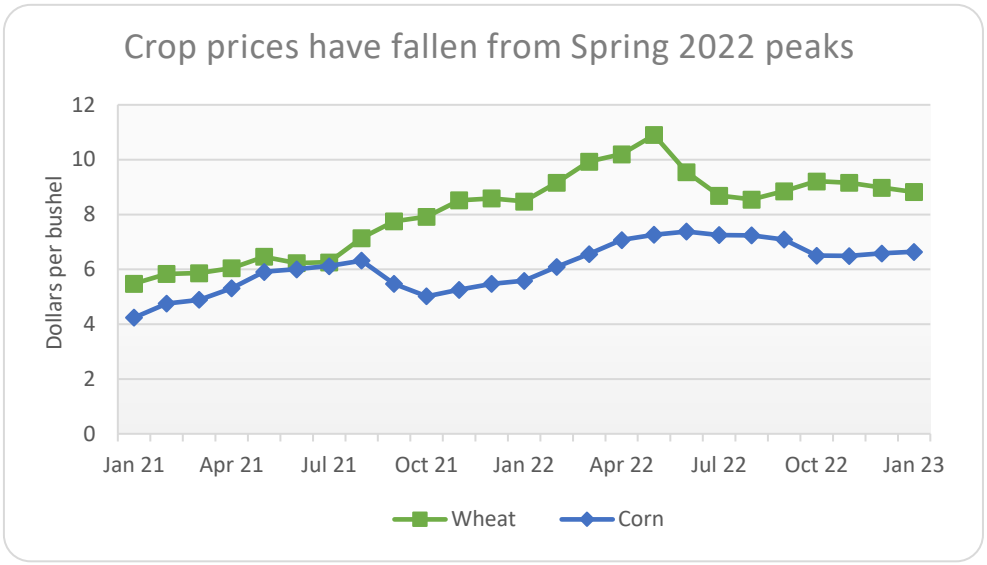
Calendar year (except as noted)	2017-2021 average	2022	2023	2024-2032 average
Livestock sector prices				
Fed steers, 5-area direct, dollars per cwt	117.27	144.40	155.51	155.40
Barrows and gilts, 51-52% lean, dollars per cwt	50.97	71.21	65.89	56.29
National wholesale broiler, cents per pound	90.86	140.50	119.95	107.27
All milk, dollars per cwt	17.86	25.55	21.62	20.28
Biofuel production, billion gallons				
Ethanol	15.4	15.4	15.5	16.0
Biomass-based diesel	2.4	3.1	3.6	4.3
Government outlays, billion dollars, fiscal year	33.7	36.7	29.5	25.8
Commodity Credit Corporation net outlays	14.1	6.6	5.5	8.9
Major commodity programs	5.8	2.1	1.2	4.7
MFP, CRP, disaster and all other CCC net outlays	8.3	4.5	4.3	4.2
Crop insurance net outlays	7.9	10.9	15.6	11.6
Other non-CCC (CFAP, PPP, disaster, conservation)	11.7	19.1	8.3	5.3
Net farm income, billion dollars	94.1	162.7	131.3	112.7
Crop and livestock sector cash receipts	381.8	543.4	504.5	478.4
Government payments	23.8	15.6	10.4	10.3
Production expenses	354.6	441.3	451.7	439.9
Real net farm income in 2023 dollars	109.5	168.7	131.3	97.7
Farm balance sheet, billion dollars				
Farm assets	3,156	3,848	4,008	4,083
Farm debt	426	504	530	559
Debt/asset ratio	13.5%	13.1%	13.2%	13.7%
Annual consumer food price inflation	2.3%	9.9%	4.4%	2.0%

Note: The estimates are based on market information available in January 2023. Projections are averages across 500 outcomes.

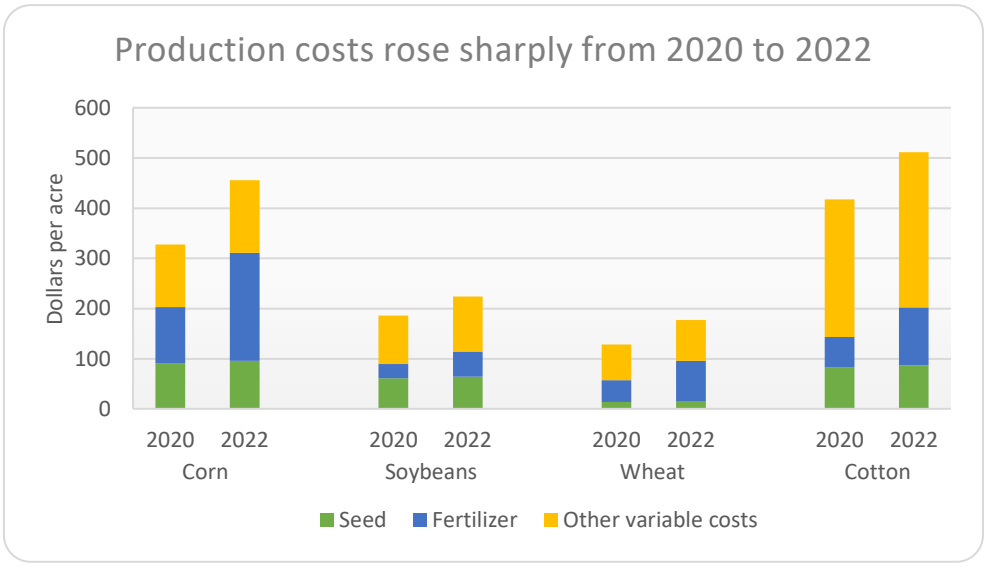
Recent developments

Prices for corn, wheat and many other farm commodities rose sharply between January 2021 and the spring of 2022. Weather, economic recovery and the Russian invasion of Ukraine all played a role.

Since the middle of 2022, prices for many commodities have declined, as earlier concerns about available supplies have lessened. The prices shown are monthly prices received by farmers, as reported by USDA's National Agricultural Statistics Service.

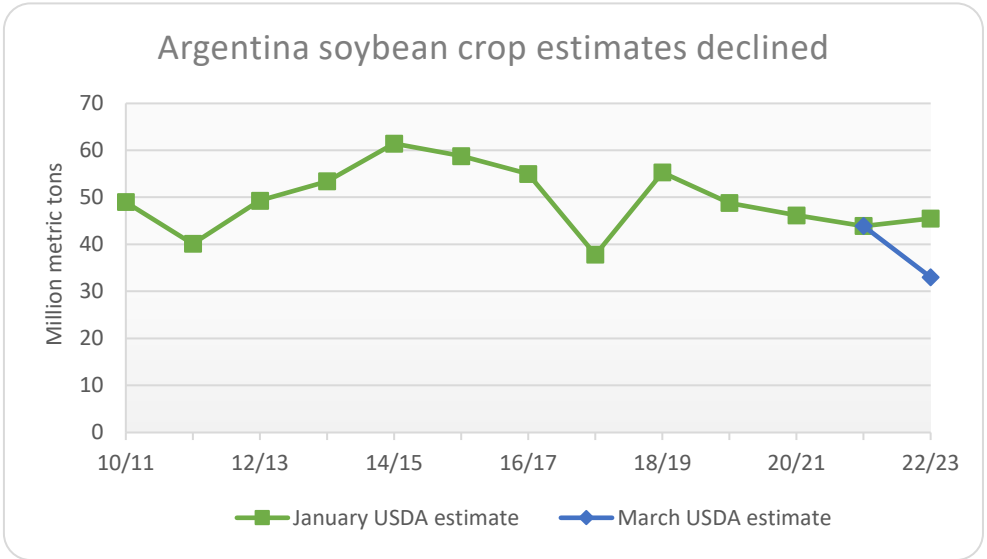


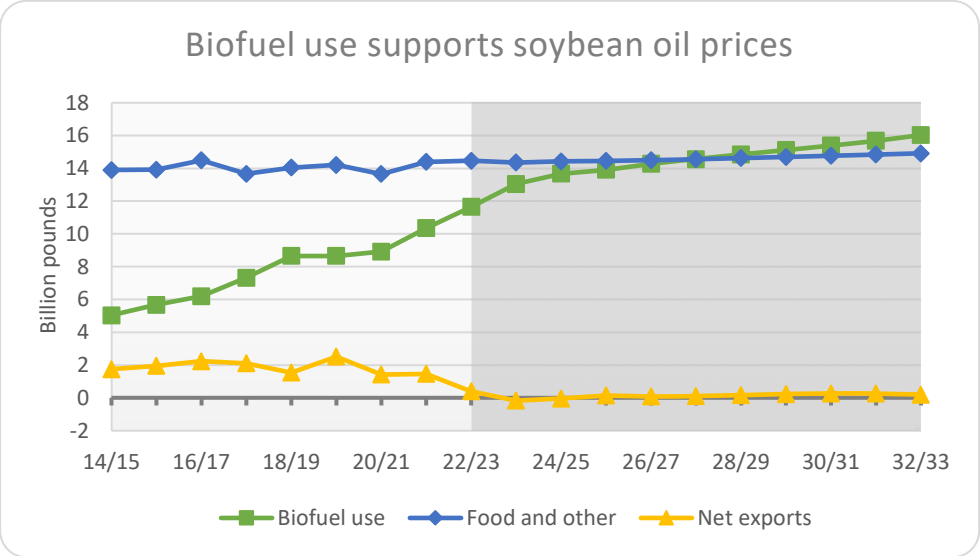
Production expenses have also increased. Higher fertilizer prices contributed to a 46% increase in corn variable costs per acre between 2020 and 2022, and large increases also occurred for other crops. Feed costs are up sharply for livestock producers and higher interest rates and labor costs also increase farm expenses. While prices of fuel and fertilizer are down from their mid-2022 peak values, farm production expenses remain much higher than they were in prior years.



The commodity market projections in this report are based on information available in January 2023. Subsequent developments have had an impact on the market outlook, but would not be reflected in the figures reported here.

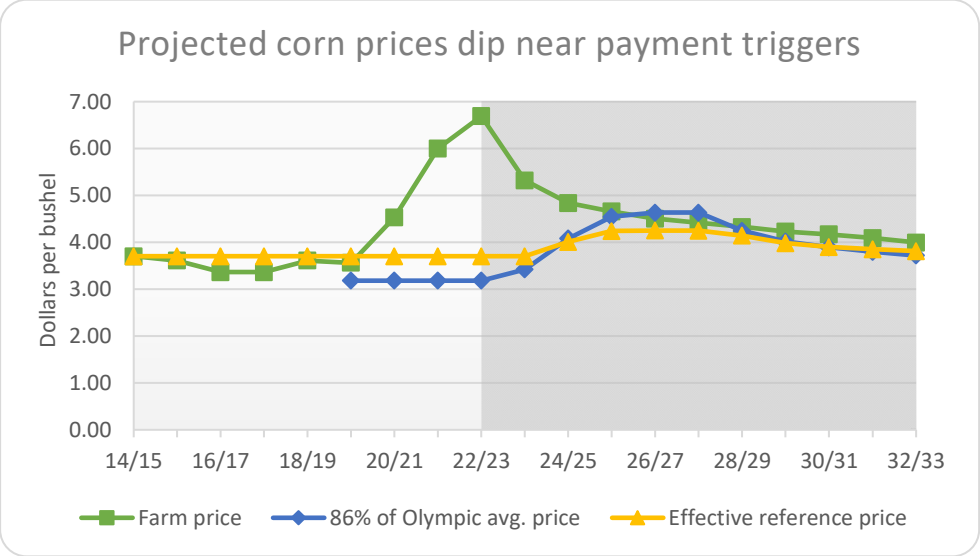
For example, drought conditions in Argentina have reduced soybean production. USDA's March 2023 estimate of Argentina's soybean crop is more than 12 million metric tons smaller than its January estimate. This would support soybean sector prices, but other recent developments also matter.



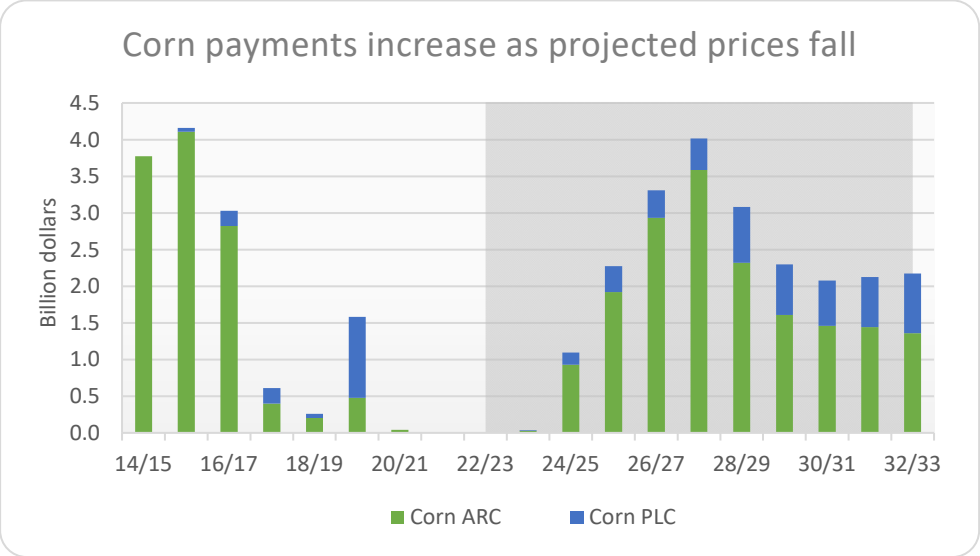


Crop outlook highlights

The rapid expansion of renewable diesel production has increased demand for soybean oil. The United States has been a net exporter of soybean oil, but the projected growth in demand from the domestic biofuel sector means U.S. exports and imports are roughly in balance. Strength in demand for soybean oil supports prices of soybean oil and soybeans. The resulting increase in soybean crush also increases supplies of soybean meal, resulting in lower meal prices.



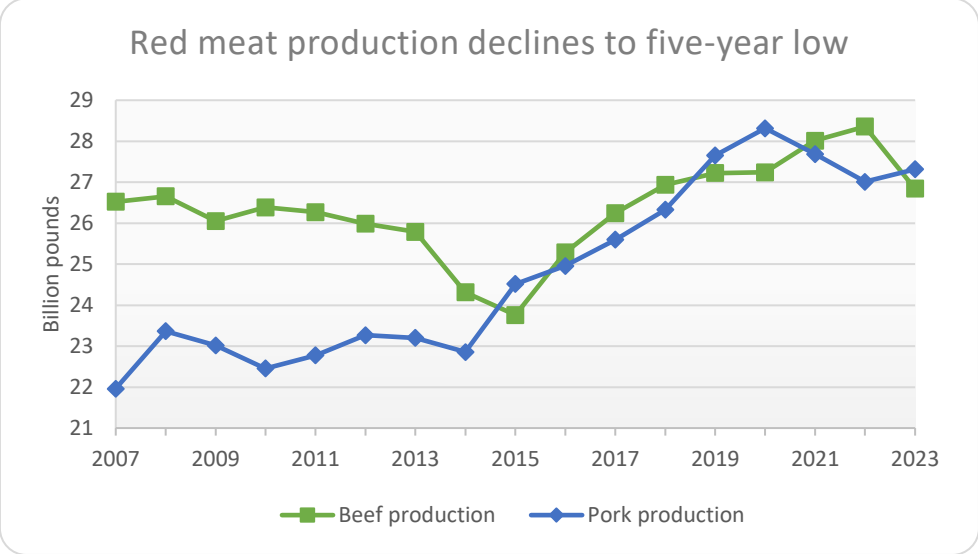
Price loss coverage (PLC) payments occur when marketing year average (MYA) prices are below the effective reference price. Agriculture risk coverage (ARC) payments occur when county per-acre revenues drop below a trigger that is based on 86% of the Olympic average MYA price multiplied by an Olympic average of county yields. Projected MYA prices decline even as the Olympic average of past prices pushes up both the ARC and PLC payment triggers. The effective reference price can exceed the statutory reference price by no more than 15%.



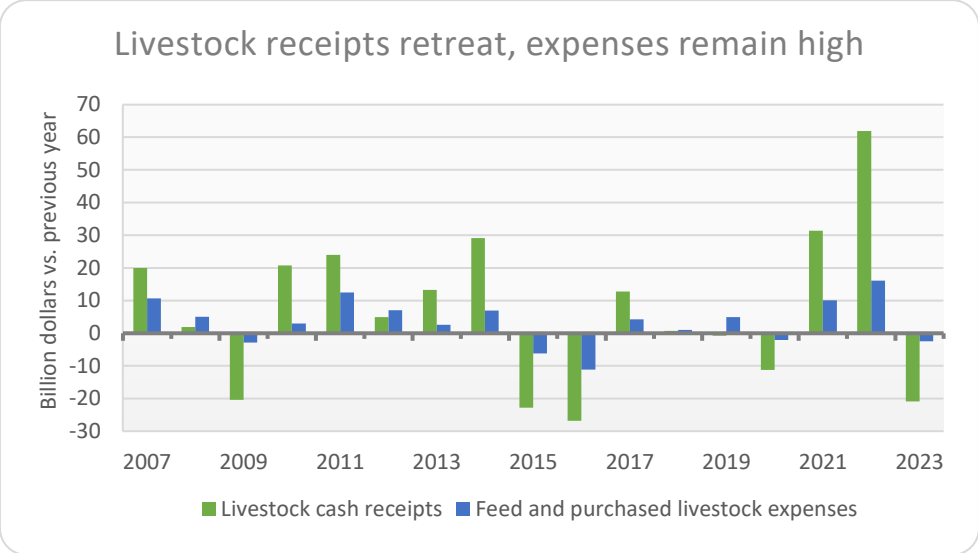
High market prices result in almost no ARC or PLC payments on corn base acreage for crops planted between 2020 and 2023. Starting in 2024, the combination of lower projected market prices and higher trigger levels for ARC and PLC increase the likelihood and size of payments. Across 500 stochastic outcomes, ARC tends to provide larger payments per base acre, so most producers are assumed to elect ARC for corn, given 2018 farm bill program provisions. Even modest changes in projected prices can have large effects on projected program participation and payments.

Livestock and dairy outlook highlights

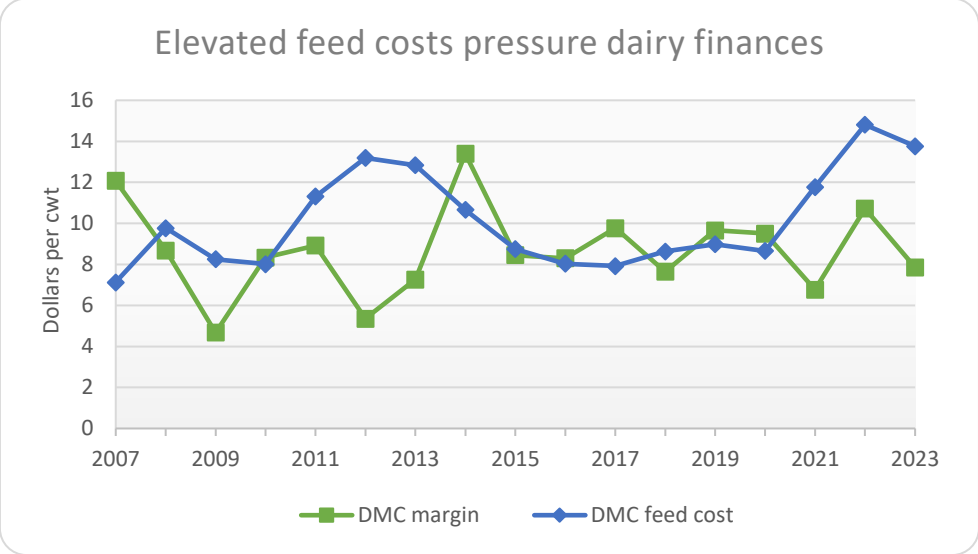
The largest decline in beef production since 2014 will outweigh modest pork production growth in 2023, leaving combined beef and pork output at its lowest level since 2018. Higher production costs and continued liquidation of the beef cow herd (due in large part to extremely dry conditions in important cow-calf production areas) are important factors in the reduced output.

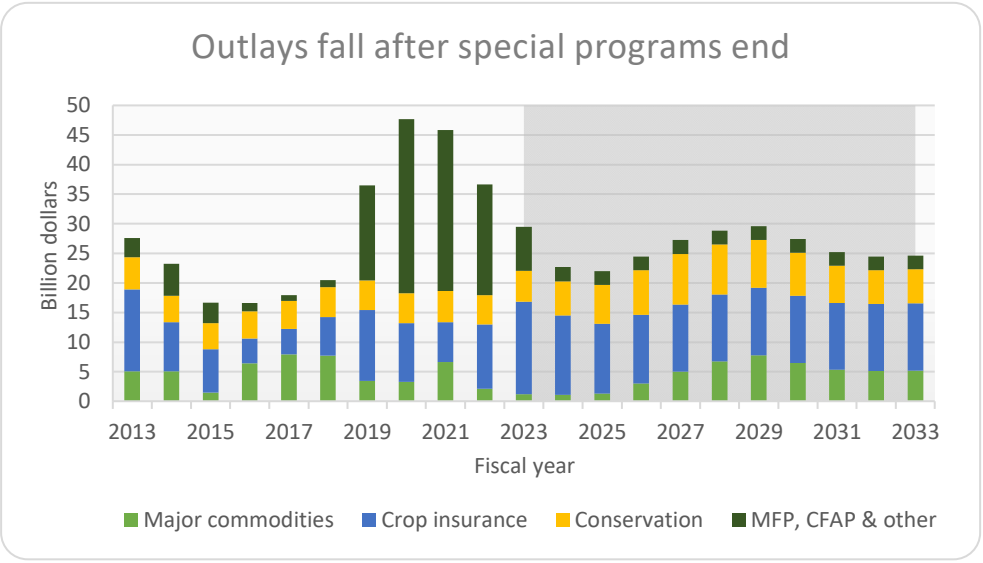


Following large back-to-back increases in livestock cash receipts, revenue for livestock producers declines in 2023. Consumer demand for meat, though still strong by historical standards, has softened in recent months and some further weakening is expected. Little relief is expected in the expense categories of purchased feed and purchased livestock, causing margins for many livestock enterprises to tighten relative to 2022.



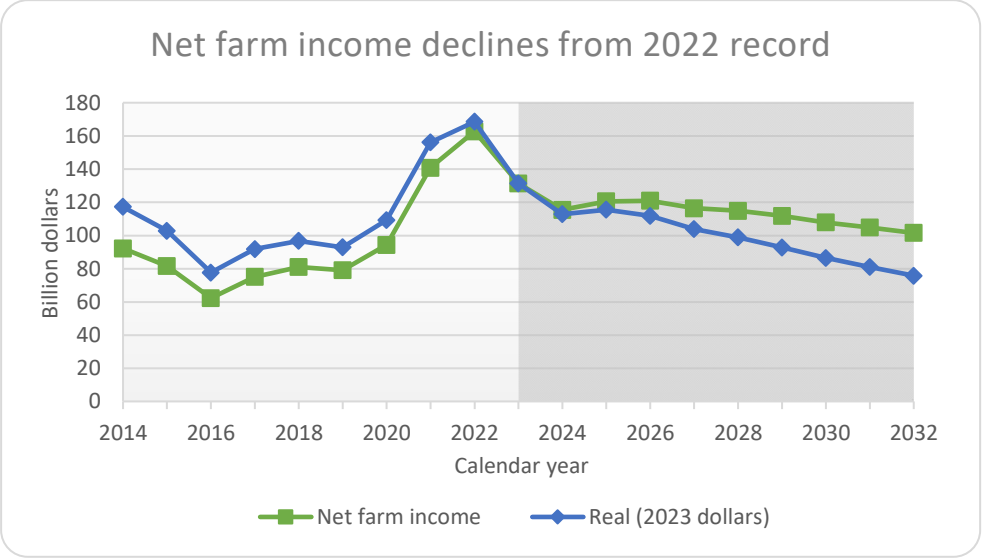
The feed cost component of the dairy margin coverage (DMC) calculation increased by more than $6/cwt from 2020 to 2022. While growth in the all milk price was even higher over that period, milk and dairy product prices have retreated faster than feed costs in recent months. With dairy demand showing signs of weakness and little relief expected in feed costs for much of 2023, margins for milk production will suffer.



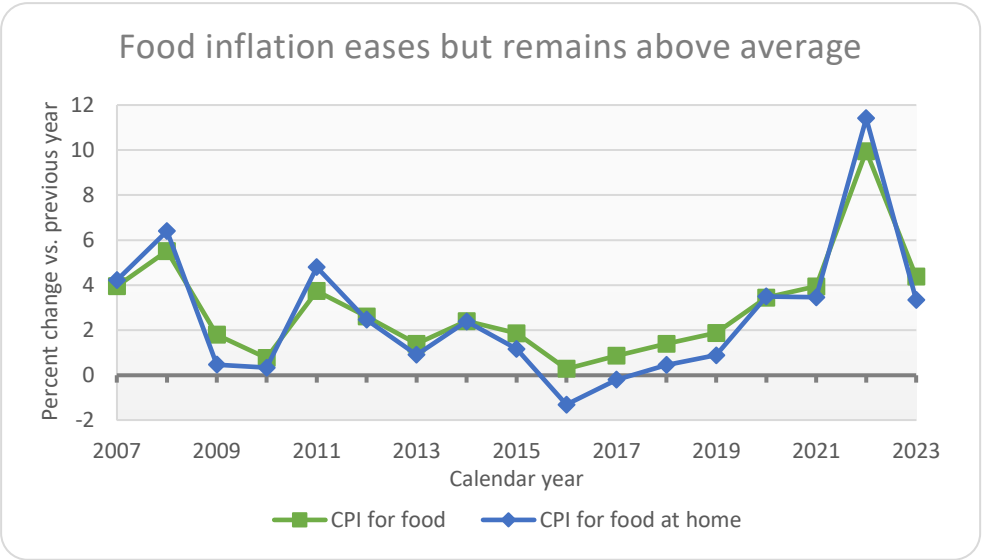


Government costs, farm income and food prices

Ad hoc programs such as the market facilitation program (MFP) and the coronavirus food assistance program (CFAP) resulted in sharply higher spending on farm-related programs in fiscal years (FY) 2019-2022. If no new ad hoc programs are authorized, projected spending falls back in FY 2023 and FY 2024 before rising again. Projected spending averages $25.7 billion/year over the FY 2024-2033 period. Crop insurance accounts for about 45% of the total outlays.



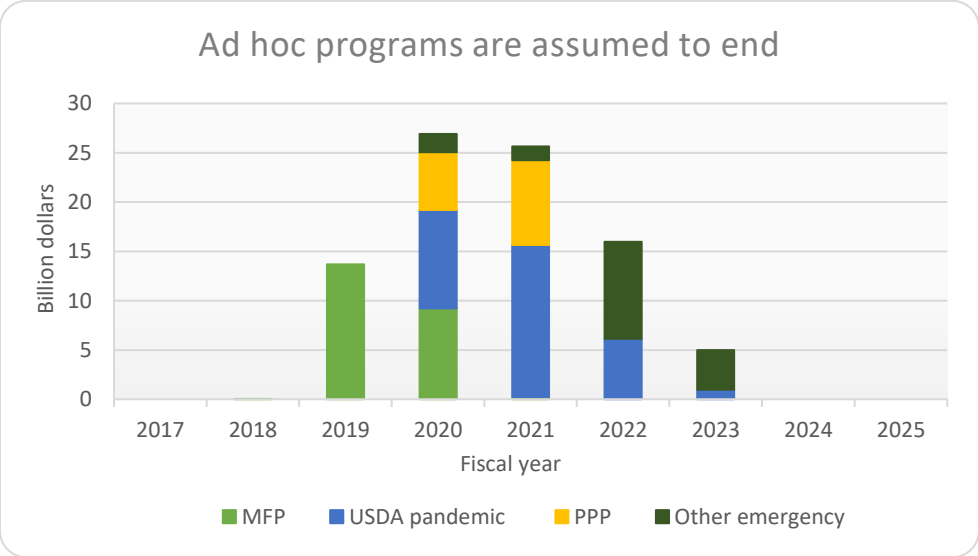
The USDA reports that 2022 net farm income was at record levels in nominal terms and the highest in decades in real terms. Projected declines in commodity prices result in lower net farm income in 2023 and 2024. While nominal net farm income stays above $100 billion each year, real net farm income eventually drops back to levels experienced between 2016 and 2020.



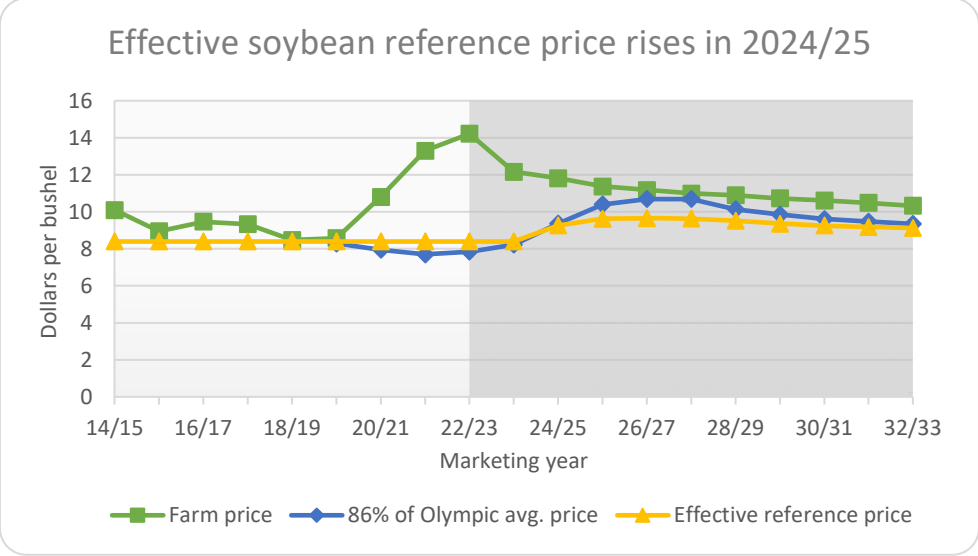
The consumer price index (CPI) for food grew by nearly 10% last year, the largest annual increase since 1979. Additionally, the CPI for food at home outpaced the overall food CPI by the largest amount since 1973. Though farm prices for many food commodities have retreated from recent highs, food inflation remains relatively high in 2023, as less than 15% of every dollar spent on food is received by producers at the farm level.

Policy assumptions

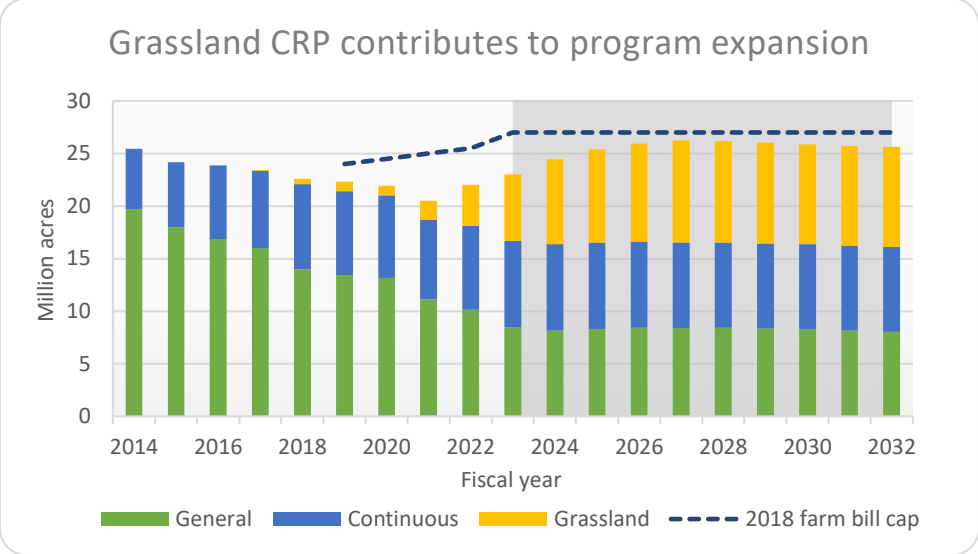
MFP compensated farmers for the impacts of retaliatory trade measures. USDA has provided pandemic assistance through CFAP and the pandemic assistance program (PAP). The paycheck protection program (PPP), a Small Business Administration program, offered forgivable loans. Additional ad hoc USDA programs have provided disaster aid. This current-policy outlook assumes no new ad hoc programs.



The outlook assumes provisions of the 2018 farm bill through 2032/33. Producers face annual decisions about whether to elect ARC or PLC for the eligible base acreage on their farms. The 2018 farm bill allows effective reference prices to exceed the statutory level by up to 15% when an Olympic average of past market prices exceeds the effective reference price by a sufficient amount. ARC payments trigger when county revenues per acre drop below a trigger based on 86% of Olympic averages of prices and county yields.



The current cap on conservation reserve program (CRP) enrolled acreage is 27 million acres in FY 2023, as increased and set in the 2018 farm bill. Enrolled acreage has increased steadily the past few years but remains below the cap. The grassland CRP program has seen rapid growth since introduction and in this baseline is assumed to account for all of the net growth in acres and push total enrolled acreage close to the cap by 2026. General and continuous acreage is assumed to decline then remain steady.



Selected U.S. crop commodity program provisions

Policy	Crop/provision	2022/23-2023/24 average	2024/25-2032/33 average
Price loss coverage (PLC)		**Effective reference price**	**Effective reference price**
(Makes payments when marketing year average (MYA) price falls below the effective reference price. Paid on 85% of base acres and program yields. Effective reference price can exceed minimum if the moving average of MYA prices exceeds the minimum by at least 17.6%.)	Corn	$3.70 per bu.	$4.05 per bu.
	Soybeans	$8.40 per bu.	$9.40 per bu.
	Wheat	$5.50 per bu.	$5.75 per bu.
	Long grain rice	$14.00 per cwt	$14.00 per cwt
	Japonica rice	$17.30 per cwt	$17.30 per cwt
	Sorghum	$3.95 per bu.	$4.19 per bu.
	Barley	$4.95 per bu.	$4.98 per bu.
	Oats	$2.40 per bu.	$2.76 per bu.
	Peanuts	$535.00 per ton	$535.00 per ton
	Sunflowers	$0.202 per lb	$0.216 per lb
	Seed cotton	$0.367 per lb	$0.368 per lb
Marketing loan program		**Loan rate**	**Loan rate**
(Producers can borrow at the loan rate and receive benefits if a market price indicator falls below the loan rate.)	Corn	$2.20 per bu.	$2.20 per bu.
	Soybeans	$6.20 per bu.	$6.20 per bu.
	Wheat	$3.38 per bu.	$3.38 per bu.
	Rice	$7.00 per cwt	$7.00 per cwt
	Upland cotton	$0.520 per lb	$0.520 per lb

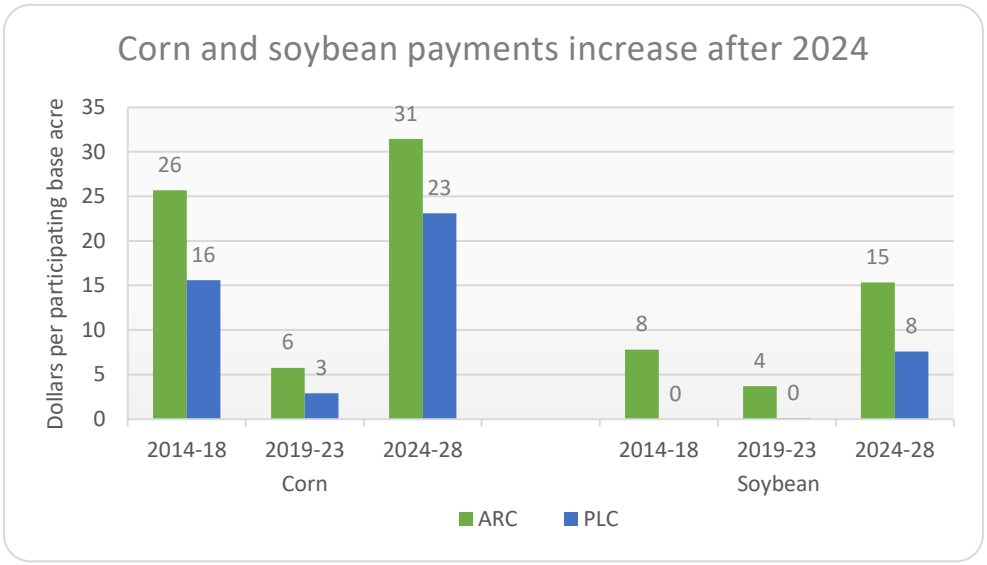
Other policy assumptions

Policy	Description
Agriculture risk coverage (ARC)	County version (ARC-CO) makes payments when county revenues per acre fall below 86% of benchmark county revenue tied to moving averages of MYA prices and trend-adjusted county yields. Payments are made on 85% of base acreage.
Dairy margin coverage (DMC)	Milk producers receive payments when the margin between milk prices and an indicator of feed prices falls below coverage levels chosen by the producer. Producers pay premiums, with much lower premiums on the first 5 million pounds of milk than than on additional quantities.
Conservation reserve program (CRP)	Maximum allowed enrollment increases to 27 million acres by 2023. Maximum rental rate is 85% of county average rental rate for general signups and 90% of county average rental rate for continuous signups.
Trade policies	Trade policies in place in January 2023 continue. No follow-on to the Phase 1 agreement with China is assumed.
Coronavirus and other ad hoc programs	Pandemic assistance programs announced prior to mid-January 2023 are implemented, but no new programs are assumed.

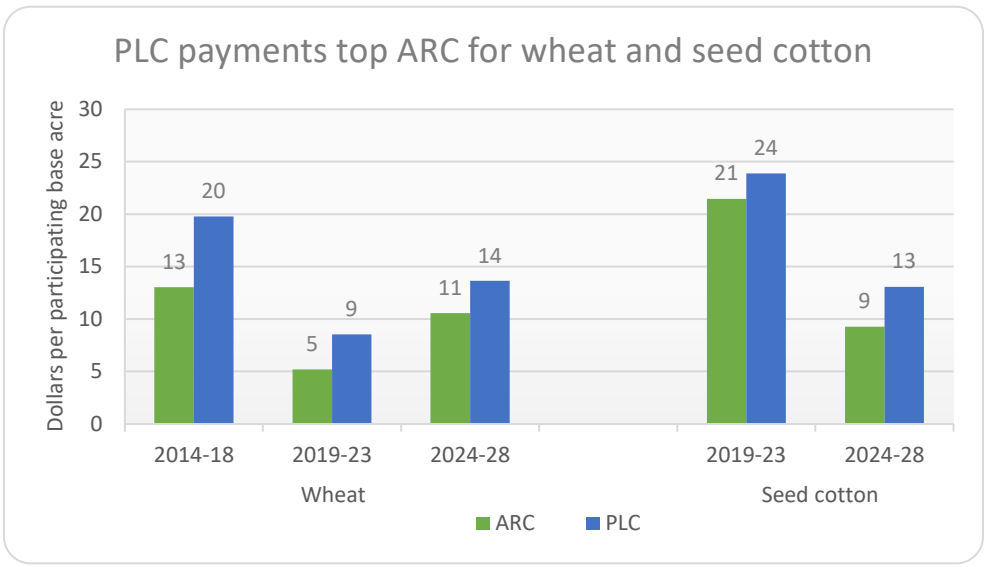
Note: These policy assumptions are not a prediction of future policy outcomes. Alternative policy scenarios can be evaluated against this current policy baseline.

Crop program payments and participation

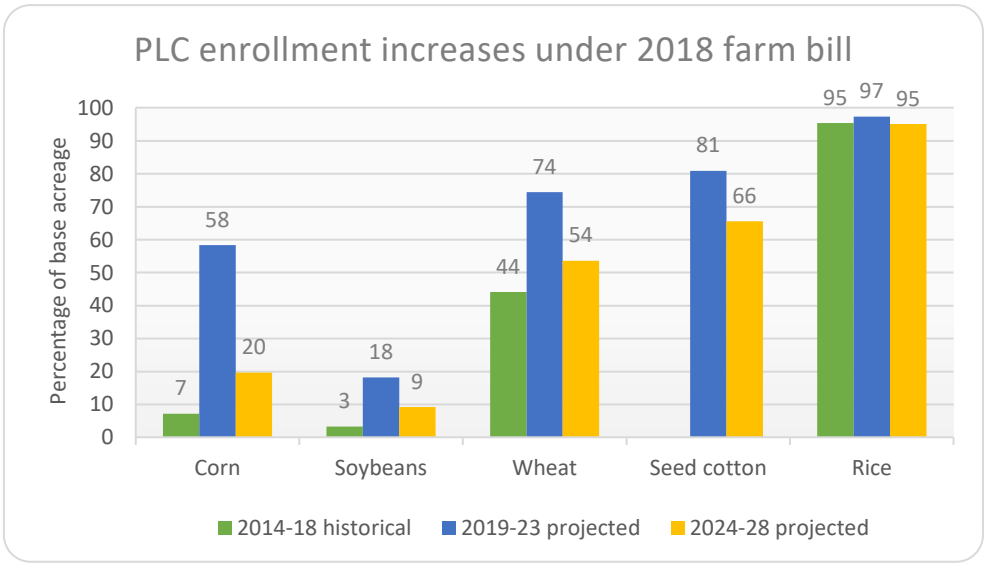
Under the 2014 farm bill, national average ARC payments per participating corn base acre exceeded PLC payments. Under the 2018 farm bill, changing market conditions reduce corn payments under both programs. To date, no PLC payments have been made to soybean producers. Projected average payments are greater in the 2024-28 period for both crops and both programs, as market prices fall and ARC and PLC payment triggers increase in response to higher Olympic average prices.



For wheat, seed cotton and many other crops, historical and projected average PLC payments exceed ARC payments per participating base acre. Seed cotton only became eligible for ARC and PLC payments in 2018. Note that payments can vary greatly from one year to the next because of changing market conditions, and for many commodities, the most likely payment rate in any given year is zero. In addition ARC payments vary geographically, as they depend in part on county-level yields.



The 2018 farm bill gave producers the opportunity to make new ARC-PLC elections in 2019, 2021, 2022 and 2023. Given expected payment rates, much of the corn and wheat base acreage shifted from ARC to PLC in 2019, while most soybean base remains enrolled in ARC. Looking ahead, projected average ARC payments exceed PLC payments for corn, so more corn base may be enrolled in ARC if current program provisions remain in place. Most wheat, seed cotton and rice base acreage has been enrolled in PLC, and this is expected to continue.

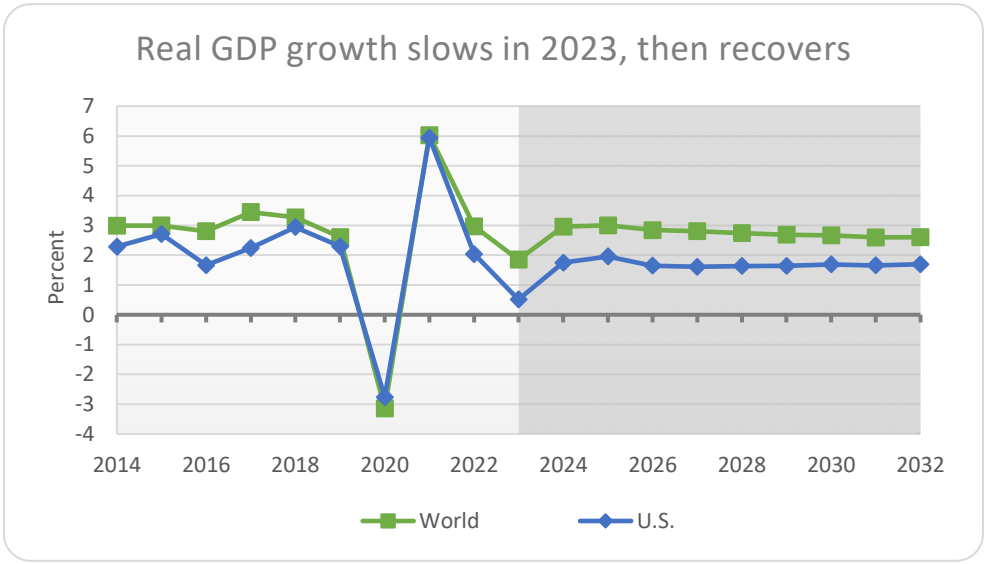


ARC and PLC payments and participation rates

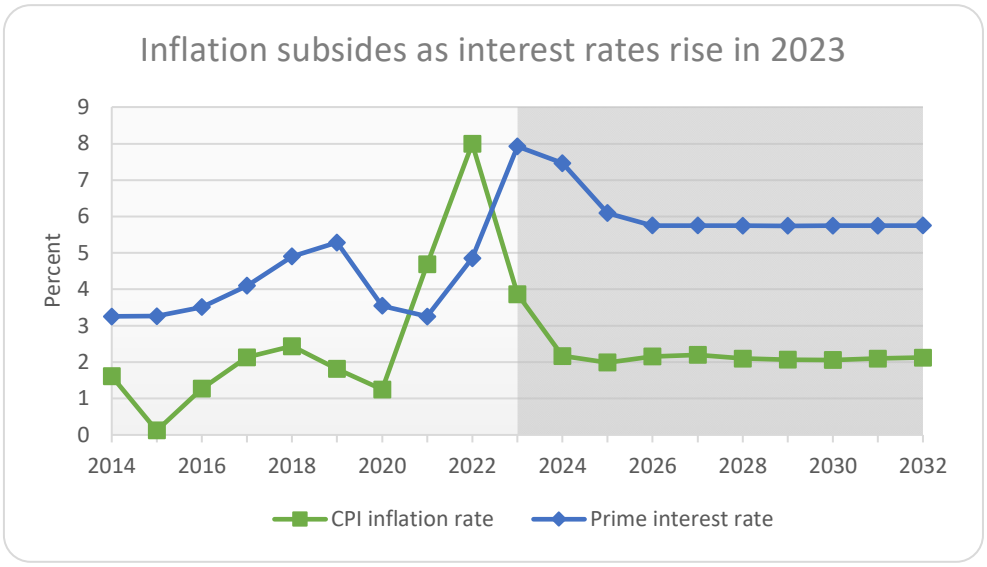
	Average ARC payment	Average PLC payment	Share of base acres in ARC	Share of base acres in PLC
Average for 2014-2018 crop years	(Dollars per base acre)		(Percent)	
Corn	25.67	15.59	92.8	7.2
Soybeans	7.80	0.00	96.7	3.3
Wheat	13.04	19.77	55.9	44.1
Sorghum	14.88	29.73	31.0	69.0
Barley	7.50	7.17	25.2	74.8
Oats	8.62	4.55	65.9	34.1
Rice	18.86	125.07	4.6	95.4
Peanuts	45.40	201.51	0.3	99.7
Sunflower seed	8.17	17.90	43.5	56.5
Canola	15.30	43.56	2.8	97.2
Average for 2019-2023 crop years				
Corn	5.76	2.90	41.6	58.4
Soybeans	3.70	0.10	81.8	18.2
Wheat	5.19	8.55	25.6	74.4
Sorghum	3.68	6.22	20.0	80.0
Barley	5.99	4.12	21.1	78.9
Oats	1.65	0.00	44.8	55.2
Seed cotton	21.46	23.87	19.1	80.9
Rice	2.25	60.90	2.7	97.3
Peanuts	19.86	91.21	1.0	99.0
Sunflower seed	3.60	1.29	28.1	71.9
Canola	8.32	17.29	12.2	87.8
Average for 2024-2028 crop years				
Corn	31.44	23.12	80.3	19.7
Soybeans	15.35	7.58	90.8	9.2
Wheat	10.56	13.63	46.4	53.6
Sorghum	11.49	16.33	19.5	80.5
Barley	8.90	16.81	26.4	73.6
Oats	2.10	0.18	63.5	36.5
Seed cotton	9.26	13.07	34.4	65.6
Rice	27.02	55.07	4.9	95.1
Peanuts	27.46	110.18	1.1	98.9
Sunflower seed	6.87	1.11	75.3	24.7
Canola	9.16	6.98	76.2	23.8

Macroeconomic assumptions and farm prices paid

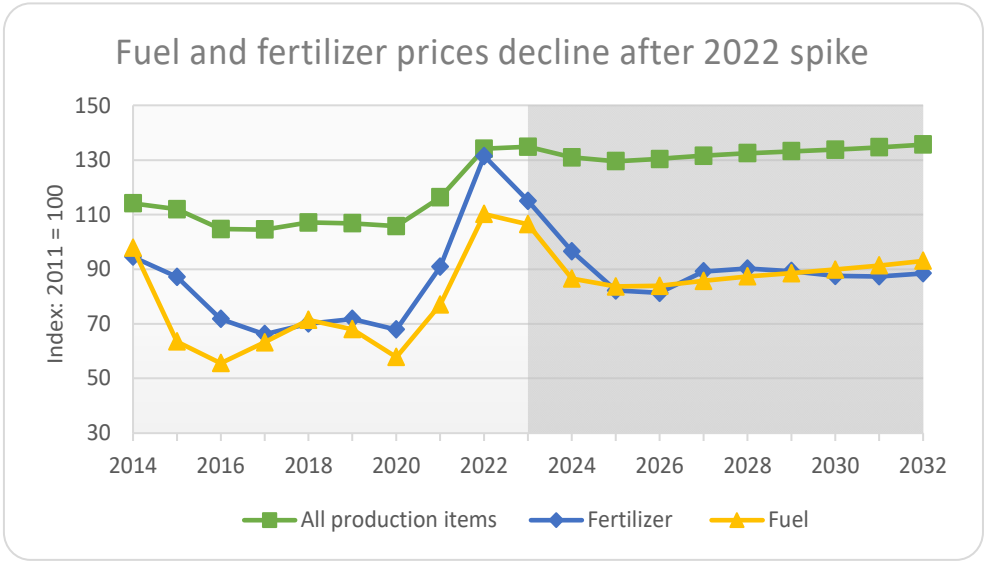
Real GDP fell in 2020 due to the pandemic and rebounded sharply in 2021. In January 2023, S&P Global forecasted slower growth in the U.S. and world economies in 2023, followed by a return to more normal rates of growth in 2024. Changes in GDP and consumer spending can have important impacts on farm commodity demand and prices.



U.S. CPI reached the highest level in decades in 2022. In response, the Federal Reserve increased interest rates. In its January 2023 forecast, S&P Global expected inflation to subside in 2023 and return to the Fed's target of 2% in 2024. Once that occurs, S&P suggests that interest rates could be reduced. Note that the forecasted prime rate remains above the pre-pandemic level through 2032. Higher interest rates increase farm borrowing costs and may put downward pressure on farm real estate values.



The Russian invasion of Ukraine contributed to a sharp increase in fuel prices in 2022. Fertilizer prices also spiked in response to higher natural gas prices (especially in Europe), strong demand caused by high farm commodity prices and other factors. Prices for those key inputs have declined from their 2022 peaks, and further drops are projected in 2024 and 2025. However, higher interest and labor costs keep the index of farm production item prices elevated in 2023, with only slight reductions ahead.



Macroeconomic assumptions

Calendar year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Real GDP growth					(Percent change from previous year)						
United States	2.0	0.5	1.8	2.0	1.6	1.6	1.6	1.6	1.7	1.7	1.7
China	2.8	5.0	5.8	5.0	4.9	4.7	4.6	4.4	4.3	4.0	4.1
World	3.0	1.9	3.0	3.0	2.8	2.8	2.7	2.7	2.7	2.6	2.6
Population growth											
United States	0.3	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
World	0.8	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.8
U.S. CPI, all urban consumers	8.0	3.9	2.2	2.0	2.2	2.2	2.1	2.1	2.1	2.1	2.1
U.S. real disposable income	-6.4	2.7	3.7	2.9	2.4	2.5	2.4	2.3	2.3	2.3	2.3
					(Percent)						
U.S. unemployment rate	3.7	4.6	4.8	4.5	4.4	4.4	4.4	4.3	4.3	4.3	4.3
3-month Treasury bill rate	2.0	4.6	4.0	2.7	2.4	2.4	2.4	2.4	2.4	2.4	2.4
Prime interest rate	4.9	7.9	7.5	6.1	5.8	5.7	5.7	5.7	5.7	5.7	5.8
Petroleum prices					(Dollars per barrel)						
West Texas Intermediate	94.72	85.16	82.29	83.57	84.20	86.43	87.90	89.58	91.29	92.99	94.76
Refiners' acquisition cost	95.07	86.32	83.38	85.12	86.24	88.65	89.99	91.58	93.40	95.25	97.13
Natural gas price					(Dollars per million BTU)						
Henry Hub	6.43	4.83	4.49	4.23	5.19	5.71	5.56	5.30	5.04	5.16	5.31
Exchange rates					(Currency per dollar)						
Euro	0.95	0.93	0.90	0.88	0.87	0.86	0.86	0.85	0.85	0.85	0.85
Chinese yuan	6.73	6.63	6.38	6.26	6.19	6.23	6.34	6.40	6.48	6.55	6.58

Source: S&P Global, January 2023

Indices of prices paid by farmers

Calendar year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Production items, interest,					(2011 = 100)						
taxes and wages	135.7	138.1	136.0	135.1	136.4	138.1	139.8	141.3	142.6	144.3	146.0
Production items	134.1	134.9	131.0	129.5	130.3	131.5	132.5	133.2	133.8	134.7	135.7
Feed	141.8	139.0	124.3	119.1	116.8	115.3	114.1	113.1	112.1	111.1	110.0
Livestock & poultry	122.5	122.7	132.9	138.8	139.7	135.5	133.0	130.8	127.6	125.6	123.4
Seeds	129.6	138.7	144.3	146.5	147.6	148.4	149.1	149.8	150.6	151.5	152.4
Fertilizer	131.4	115.0	96.5	82.2	81.3	89.2	90.2	89.3	87.5	87.4	88.5
Mixed fertilizer	118.8	101.9	93.7	79.3	78.5	86.1	86.8	85.8	84.0	83.9	85.0
Nitrogen fertilizer	150.9	126.4	95.8	82.3	81.1	88.8	90.4	89.8	88.1	87.6	88.6
Potash and phosph.	109.8	107.1	95.0	80.2	80.2	88.1	88.5	87.2	85.5	86.1	87.5
Agricultural chemicals	143.0	147.3	136.1	125.9	127.9	129.9	132.2	134.5	136.9	139.4	142.0
Fuels	110.2	106.4	86.6	83.6	83.9	85.7	87.3	88.5	89.8	91.4	93.0
Supplies & repairs	139.0	135.8	137.0	139.9	143.3	147.0	150.9	154.9	159.0	163.3	167.8
Autos & trucks	124.5	128.6	129.6	130.5	131.6	132.9	134.5	136.2	137.9	139.8	141.7
Farm machinery	171.4	162.6	153.8	151.9	152.8	154.7	156.4	158.3	160.2	162.6	164.9
Building material	163.6	169.7	172.0	173.9	176.0	178.5	181.2	184.2	187.5	191.0	194.6
Farm services	132.7	136.5	137.7	139.7	142.8	146.1	149.5	153.0	156.6	160.4	164.3
Interest*	112.9	149.1	152.0	138.6	133.8	134.5	135.9	137.4	138.9	140.5	142.2
Taxes**	134.9	143.8	156.8	162.7	166.0	170.6	177.1	183.8	189.6	194.9	199.7
Wage rates	156.9	163.9	170.8	177.2	183.7	190.2	196.9	203.6	210.4	217.6	225.2

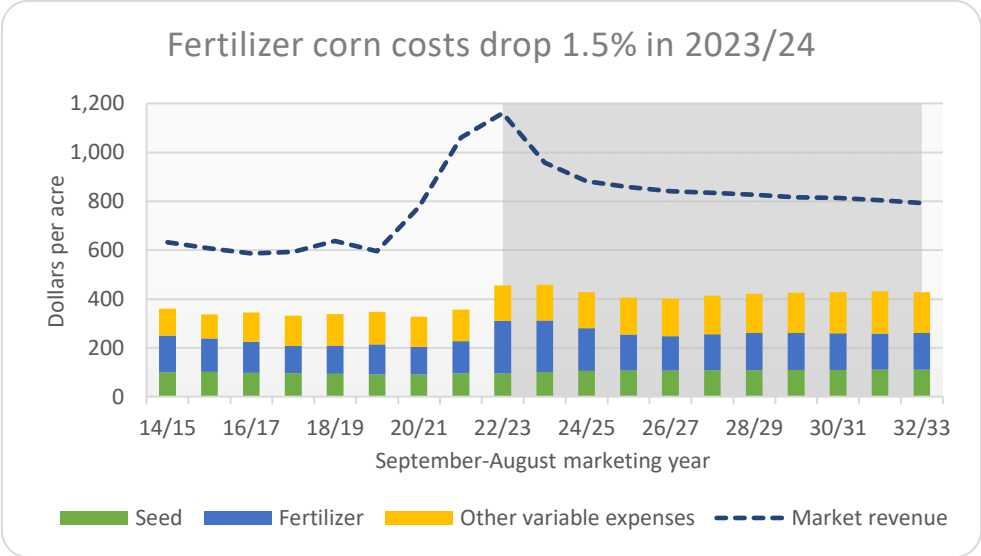
* Interest per acre on farm real estate debt and interest rate on farm non-real estate debt.

** Farm real estate taxes payable per acre.

Crop variable expenses

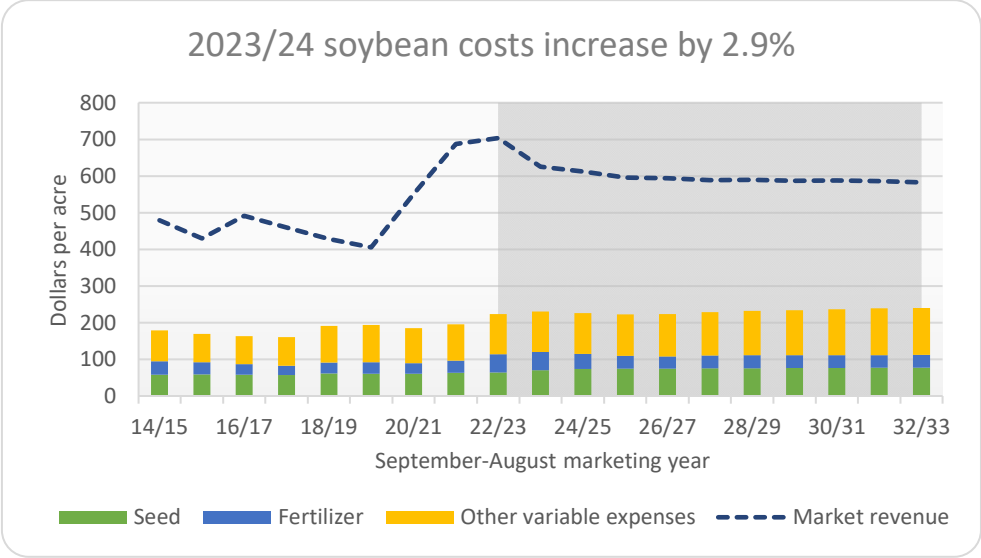
For corn, cost increases in seed, labor and interest more than offset a decline in fertilizer, fuel and repair costs, resulting in a 0.1% increase in variable expenses in 2023/24. Sharp declines in fertilizer, fuel and chemical costs in 2024-26 leave variable costs below those of 2023.

We define variable production expenses to be USDA's operating expenses plus hired labor. This includes seed, fertilizer, fuel, chemicals and other variable inputs, but does not include the cost of land or machinery replacement.

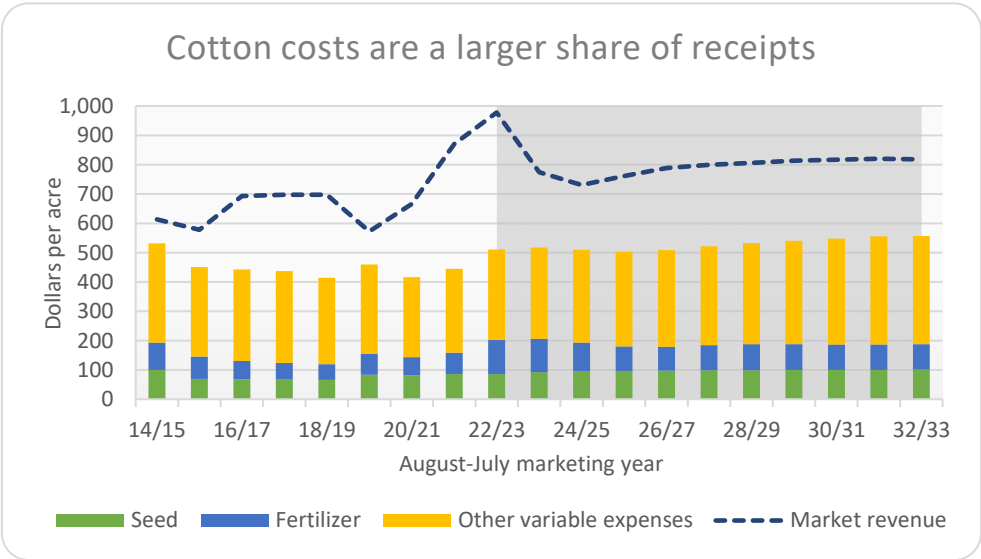


Relative to corn, soybeans utilize less fertilizer, and per-acre variable production expenses are lower.

Soybean market revenues per acre are also lower than for corn, but net returns (market revenue minus variable production costs) are similar, as the crops compete for acres. Projected soybean production expenses increase by less than 0.07%/year between 2024 and 2032, after a peak in 2023.



In contrast, national average cotton variable expenses per acre are greater relative to market receipts than in the cases of soybeans and corn. Similar to the case of corn, the rise in select cotton expenses in 2023/24 counteracts declines in fertilizer and fuel expenses. Projected increases in cotton variable expenses grow by 0.2%/year 2024-2032. Agricultural chemicals, fuel, repairs and ginning costs account for most of the other variable expenses in the chart.



Crop variable costs of production

Calendar year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Corn					(Dollars per acre)						
Seed	95.78	100.67	105.50	107.08	107.79	108.35	108.89	109.43	109.99	110.63	111.34
Fertilizer	215.09	211.77	175.32	148.11	140.54	147.97	152.46	151.83	149.48	148.35	149.19
Other variable costs	163.73	162.49	147.45	144.58	147.01	150.38	153.74	156.90	160.13	163.58	167.16
Total	474.61	474.92	428.27	399.76	395.35	406.70	415.09	418.16	419.60	422.57	427.69
Wheat											
Seed	15.04	16.53	16.04	15.70	15.59	15.46	15.47	15.46	15.46	15.48	15.53
Fertilizer	81.06	80.08	66.75	60.14	56.01	57.35	59.33	59.11	58.28	57.72	57.92
Other variable costs	91.89	91.81	86.76	85.83	87.80	90.25	92.82	95.32	97.84	100.47	103.17
Total	187.98	188.42	169.55	161.67	159.41	163.05	167.62	169.89	171.58	173.68	176.62
Soybeans											
Seed	64.48	70.86	73.94	74.99	75.43	75.82	76.18	76.55	76.92	77.36	77.84
Fertilizer	49.98	49.65	41.25	35.05	33.11	34.93	35.73	35.35	34.69	34.59	34.89
Other variable costs	126.92	122.40	113.76	111.51	113.35	115.71	118.12	120.46	122.85	125.40	128.01
Total	241.39	242.91	228.95	221.54	221.90	226.46	230.03	232.36	234.46	237.35	240.74
Upland cotton											
Seed	86.80	93.09	96.01	96.75	98.01	99.02	99.59	100.02	100.47	100.94	101.47
Fertilizer	115.55	113.73	97.98	84.42	81.27	86.03	88.53	88.17	86.99	86.62	87.26
Other variable costs	347.26	359.55	346.79	344.23	353.06	361.51	367.53	372.22	376.80	382.51	388.77
Total	549.61	566.37	540.78	525.40	532.34	546.55	555.64	560.41	564.26	570.07	577.50
Rice											
Seed	93.30	101.43	102.43	103.41	103.62	103.91	104.40	104.94	105.58	106.29	107.07
Fertilizer	175.75	173.43	152.62	130.09	121.62	127.22	130.32	129.87	128.28	127.78	128.73
Other variable costs	459.24	462.02	430.58	423.98	432.90	444.29	455.78	466.87	478.18	490.12	502.39
Total	728.29	736.89	685.63	657.49	658.14	675.42	690.50	701.67	712.04	724.20	738.20
Sorghum											
Seed	14.98	16.42	16.21	16.27	16.33	16.37	16.40	16.43	16.47	16.51	16.56
Fertilizer	66.93	66.16	54.64	46.47	44.20	46.62	48.06	47.87	47.16	46.84	47.13
Other variable costs	109.90	109.66	102.88	100.90	102.90	105.37	107.88	110.31	112.77	115.38	118.03
Total	191.81	192.24	173.72	163.65	163.43	168.36	172.34	174.62	176.40	178.72	181.73
Barley											
Seed	21.05	24.46	23.42	22.60	22.25	22.13	22.11	22.09	22.08	22.08	22.11
Fertilizer	82.97	81.94	69.71	62.38	59.50	61.83	63.12	62.76	61.89	61.52	61.83
Other variable costs	101.84	99.76	91.88	89.35	90.54	92.60	94.70	96.72	98.80	101.03	103.35
Total	205.86	206.16	185.00	174.32	172.30	176.56	179.93	181.56	182.76	184.63	187.29
Peanuts											
Seed	120.23	132.03	134.58	134.45	134.40	134.76	135.31	135.86	136.39	137.06	137.73
Fertilizer	118.73	116.93	96.69	81.52	76.92	82.02	84.79	84.29	82.88	82.61	83.50
Other variable costs	421.72	416.39	387.50	381.58	389.38	398.81	408.24	417.31	426.40	435.89	445.41
Total	660.68	665.35	618.77	597.55	600.70	615.60	628.33	637.46	645.68	655.55	666.65

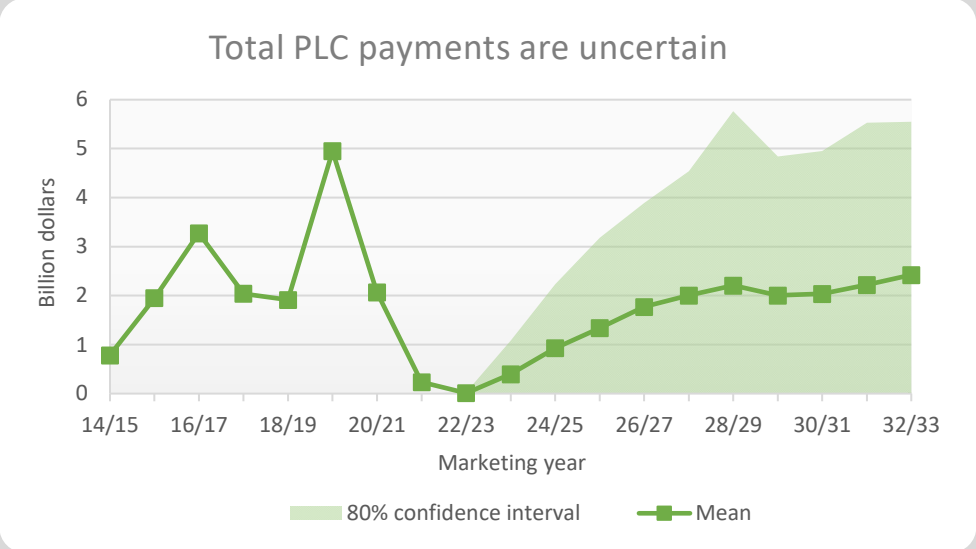
The Stochastic Baseline

This baseline is constructed to incorporate the uncertainty of projections. Any estimate of the future has a random component that cannot be known ahead of time. As a result, a subset of the variables is allowed to be stochastic. This means that they contain a random effect. Since the models are interconnected, this leads to variability throughout the system. It is impossible to capture all uncertainty. Therefore, the stochastic baseline should not be treated as thoroughly incorporating all risk. For example, the 2020 baseline did not incorporate the possibility of a pandemic shock, and the 2022 baseline did not anticipate the possibility of a Russian invasion of Ukraine.

While the tables present one number for each variable, there is actually a distribution behind each. Many of the paths for the variables appear flat as if there is little year-over-year change. The charts and tables generally present the expectation for each year, which is the mean of the distribution. In reality, our models approximate an infinite number of outcomes.

The stochastic nature of the baseline can lead to interesting results. Consider the price loss coverage (PLC) program that makes payments when the farm price falls below the effective reference price. Our expected farm price may be above the effective reference price. However, there is some probability that the price may fall below the effective reference price in the future. All of these outcomes determine the expected PLC payments. As a result, our tables may show an expected PLC payment even when the expected farm price is above the effective reference price, such as occurs in the case of corn for every year of the projection period.

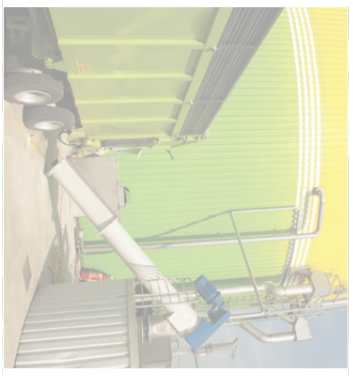
Whenever the farm price is above the effective reference price, the PLC payment is zero. However, if the inverse is true then the payment rate has a one-to-one relationship with the farm price. This creates an asymmetry in the distribution of PLC payments as the lower tail is limited at zero while the upper tail can be quite high. The table with confidence interval information for a few variables is included on the next page.



Stochastic results

Marketing year	22/23	23/24	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33
Corn price					(Dollars per bushel)						
90th percentile	6.80	6.59	6.06	5.86	5.69	5.58	5.44	5.30	5.27	5.16	5.03
Mean	6.69	5.32	4.84	4.66	4.50	4.42	4.33	4.23	4.17	4.09	3.99
10th percentile	6.59	4.29	3.68	3.52	3.44	3.36	3.20	3.22	3.16	3.13	3.08
Soybean price											
90th percentile	14.56	14.61	14.60	14.24	13.59	13.58	13.24	13.21	12.91	12.96	12.88
Mean	14.23	12.17	11.82	11.37	11.18	10.99	10.89	10.73	10.61	10.48	10.33
10th percentile	13.92	9.82	9.08	8.66	8.70	8.55	8.55	8.30	8.07	8.07	7.99
Wheat price											
90th percentile	9.13	8.74	8.20	7.91	7.63	7.56	7.36	7.11	7.20	7.02	6.94
Mean	9.08	7.39	6.60	6.29	5.99	5.90	5.77	5.66	5.59	5.52	5.43
10th percentile	9.02	6.06	5.09	4.74	4.49	4.33	4.25	4.14	4.12	4.14	4.09
PLC payments					(Million dollars)						
90th percentile	31	1,089	2,252	3,293	4,055	4,729	5,911	4,971	5,098	5,690	5,746
Mean	11	397	928	1,338	1,769	2,005	2,206	2,006	2,036	2,220	2,420
10th percentile	3	3	24	115	166	191	145	130	146	161	199
ARC payments											
90th percentile	102	271	4,063	6,901	8,586	9,465	8,123	6,290	5,846	5,802	5,477
Mean	98	113	1,365	2,928	4,272	5,086	3,607	2,620	2,347	2,289	2,211
10th percentile	94	5	33	208	370	641	233	176	140	145	161
Crop ins. net indemnities											
90th percentile	12,653	14,172	11,752	11,923	11,937	11,865	11,977	11,966	11,809	12,039	11,939
Mean	12,539	9,720	8,191	8,082	7,856	7,813	7,931	7,844	7,728	7,838	7,869
10th percentile	12,411	6,264	4,935	4,655	4,559	4,461	4,574	4,566	4,514	4,684	4,631

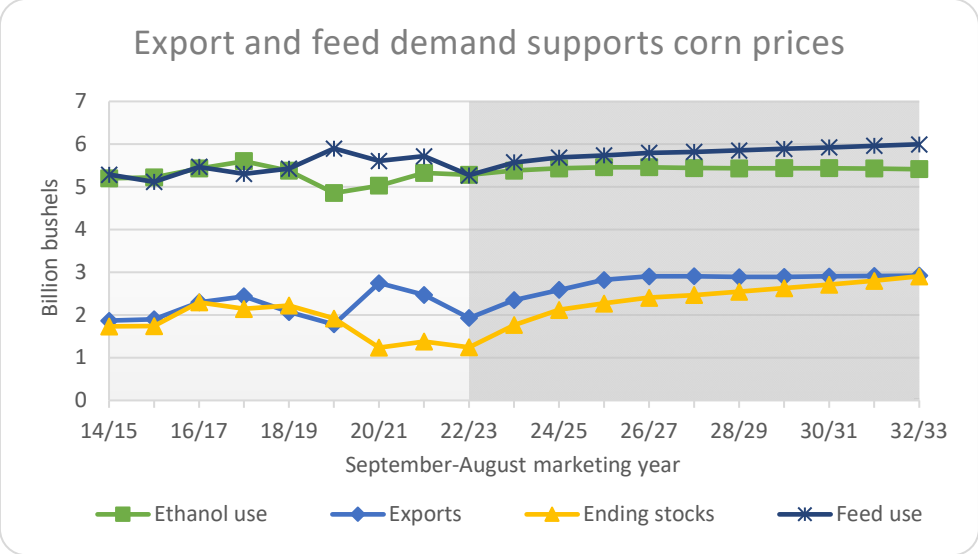




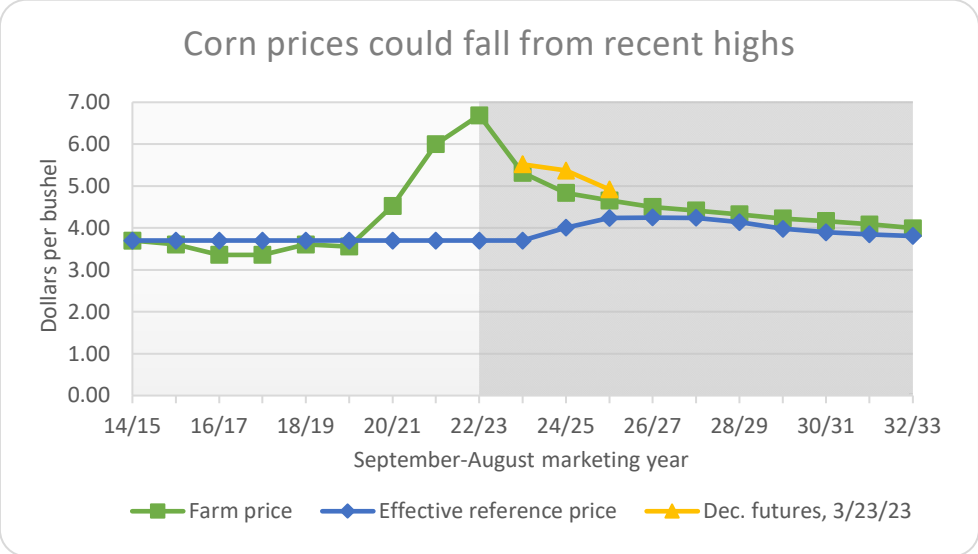

Grains

Corn

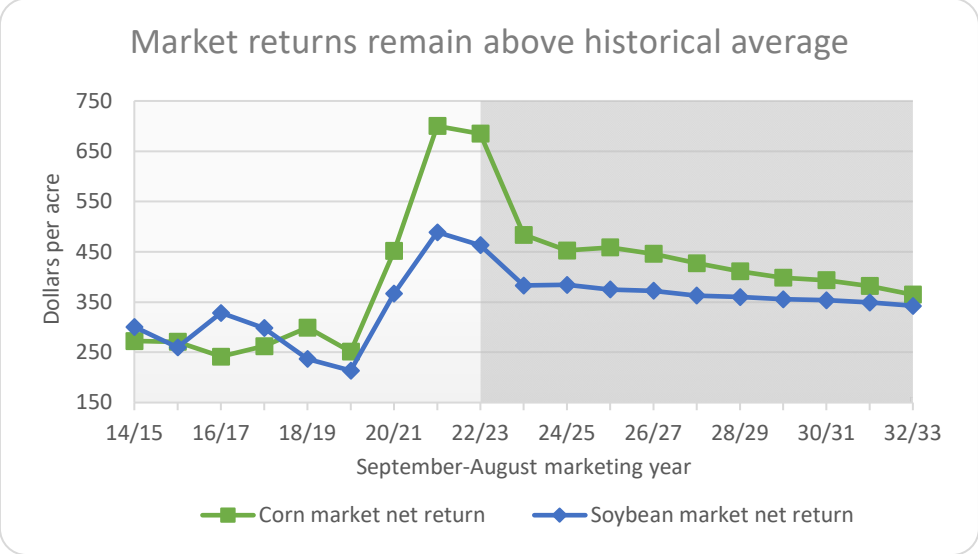
Corn prices were higher again in 2022/23 for the reasons mentioned previously. These higher prices and a stronger dollar have contributed to lower exports in 2022/23. Over the projection period, stocks build as prices fall. The stocks-to-use ratio returns to above 15% by 2026/27. Near-term export growth slows the price decline. Demand growth is projected to come primarily from feed use and exports with less from ethanol use. Projected ethanol use depends in part on renewable fuel standard (RFS) implementation.

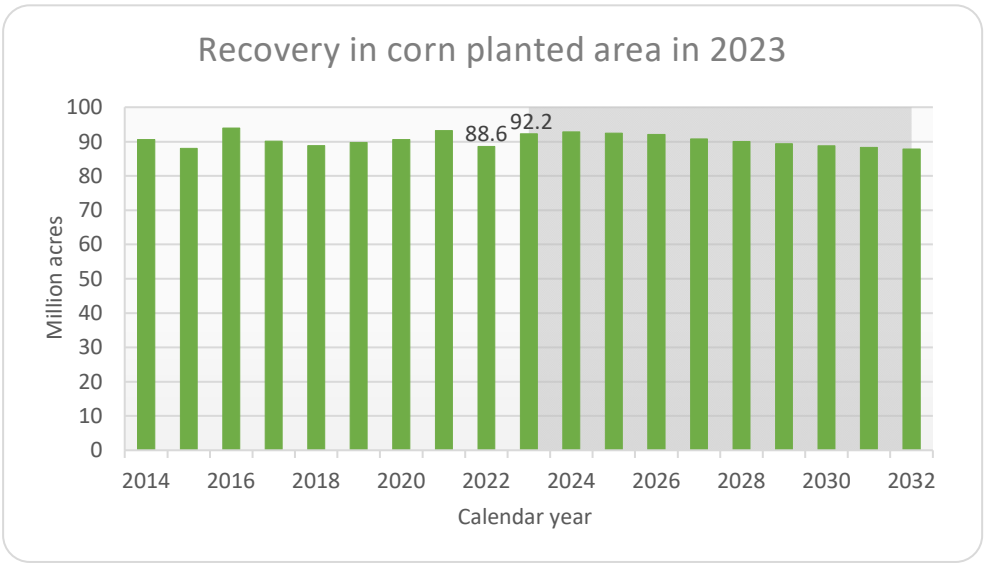


Corn prices have been on the rise for the past three marketing years but could fall in 2023/24 and later years as production recovers faster than demand grows. Higher area and trend-level yields are key to the projected price declines, and lower area, yields or other factors could keep prices elevated for longer. Prices decline to just under $4.00 by the end of the projection period. With the higher prices in recent years, effective reference prices are projected to increase in 2024/25 and later years making program payments more likely.

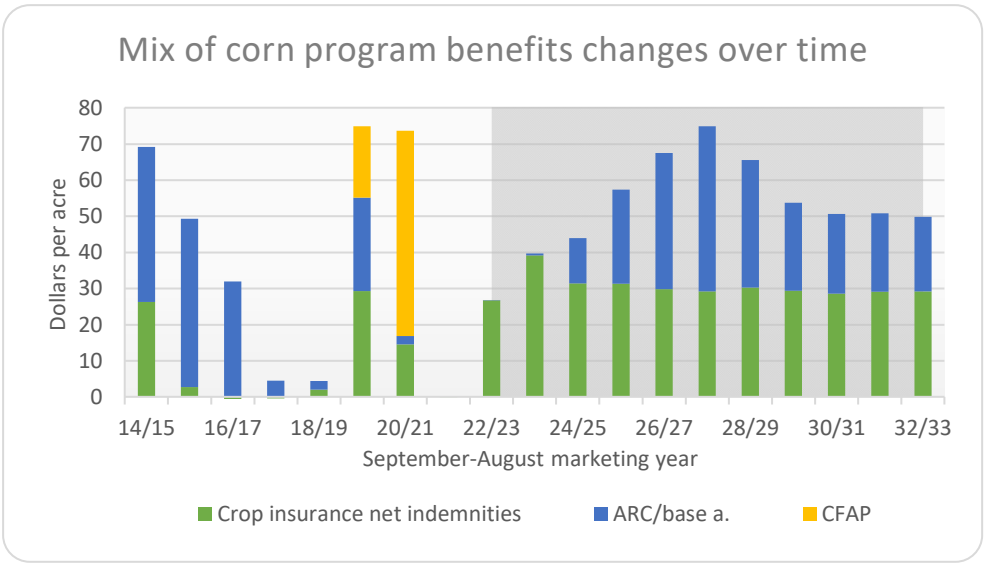


Market net returns (price multiplied by yield minus variable expenses) are projected to fall slightly for the 2022/23 marketing year relative to a year earlier but remain at elevated levels. These returns are projected to fall for both corn and soybeans in 2023/24 as market prices fall. Projected net returns decline further (but at a slower pace) in 2024/25 and later years, but remain above the average levels of 2014/15-2019/20. Note that these market net returns exclude government payments and crop insurance net indemnities.

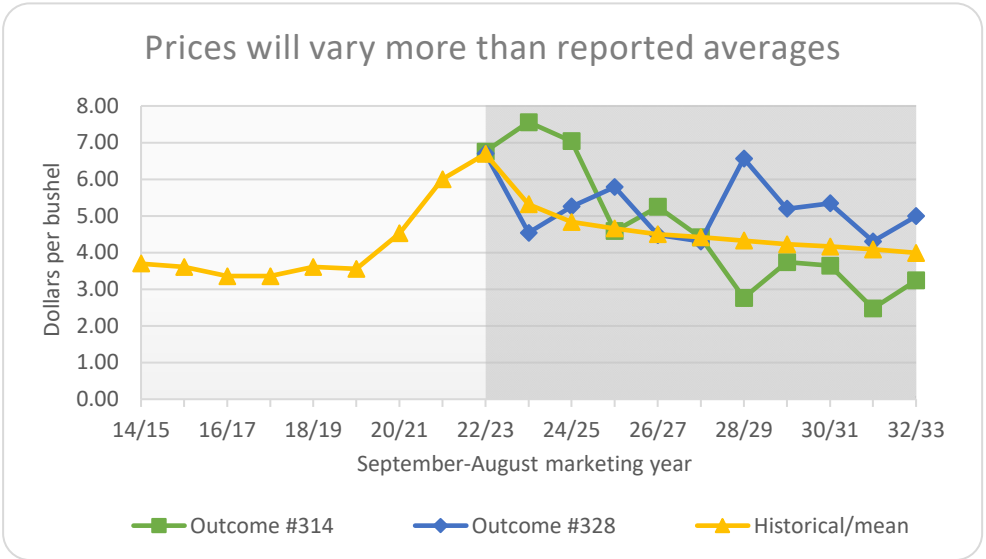




Corn area in 2023 is projected to increase to 92.2 million acres in response to projected favorable expected net returns relative to other crops despite many input prices remaining at elevated levels. Longer term, corn acreage declines as yield growth maintains supply growth, and returns to other crops are more attractive. These acreage levels assume normal conditions and could be higher or lower for a variety of reasons in any given year.



Average benefits per planted acre or per base acre for an ARC participant changes over time. In these baseline projections, ad hoc payments are assumed to go away with the average future payment made up of some combination of crop insurance or ARC program payments. Average ARC payments rise through 2027/28 as market revenues approach elevated revenue benchmarks. Projected ARC payments and crop insurance net indemnities are an average of stochastic outcomes and can be higher or lower than the averages shown in any given year.

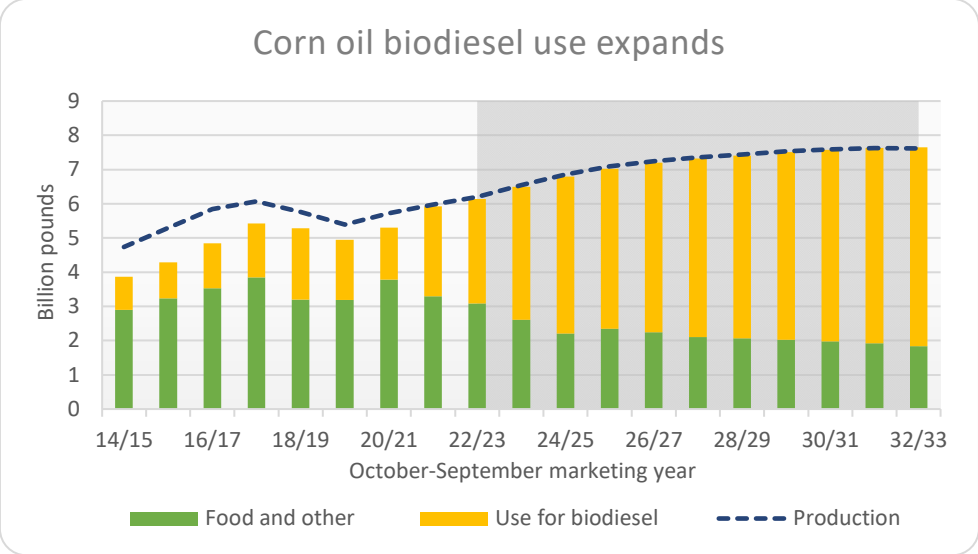


Actual crop prices will vary more than the average reported in the tables. Here we show two of the 500 simulated possible outcomes. Each outcome starts with different assumptions about uncertainties inherent to agricultural markets.

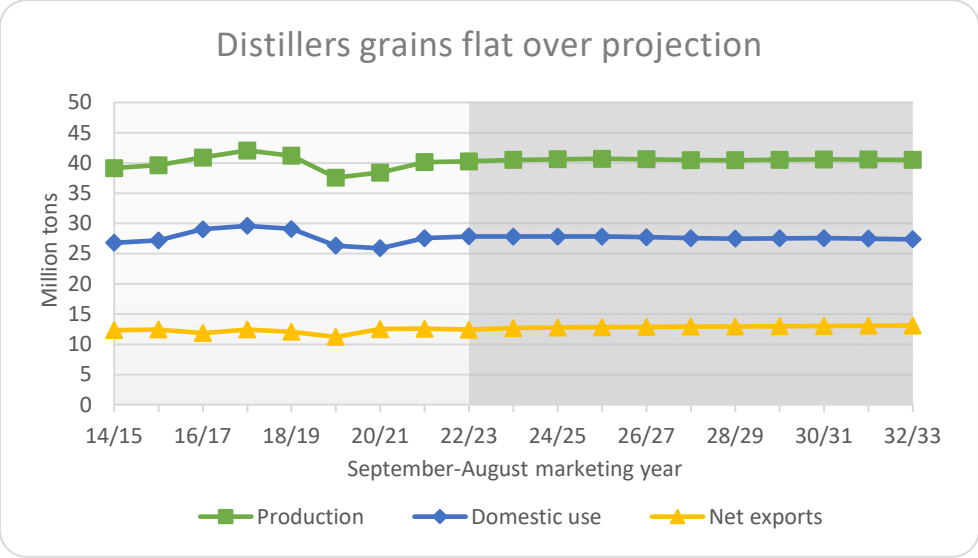
The actual price outcomes will matter for future program payments where those payments depend on averages of past prices. Under current programs, higher past prices make payments more likely when future prices fall, subject to program rules.

Corn milling products

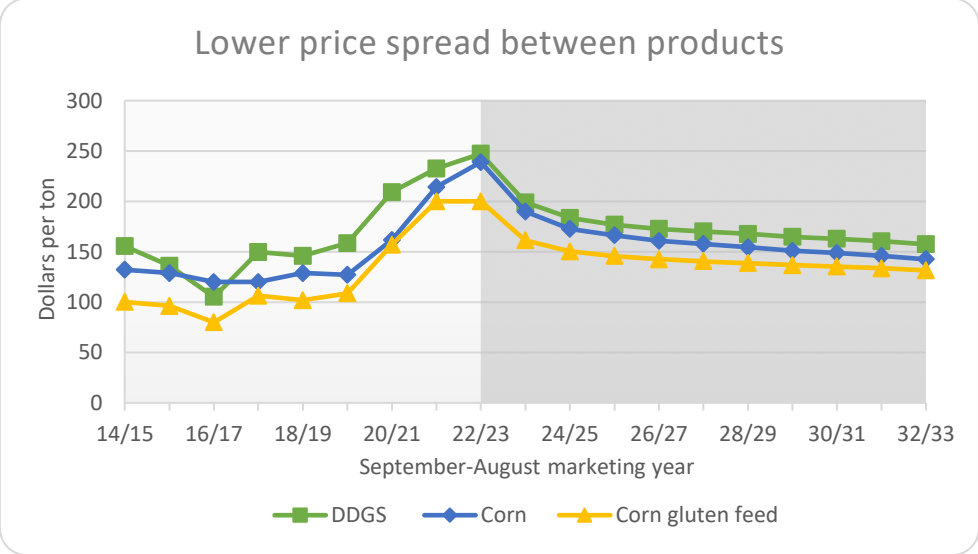
Distillers corn oil, a co-product of dry-mill ethanol production, serves as an important feedstock for biomass-based diesel production. At its current pace, this use is projected to reach 3 billion pounds in 2022/23. Over the course of the projection period, it nearly doubles to 5.8 billion pounds by 2032/33. Overall, corn oil production rises to around 7.5 billion pounds and levels off along with dry-mill ethanol production.

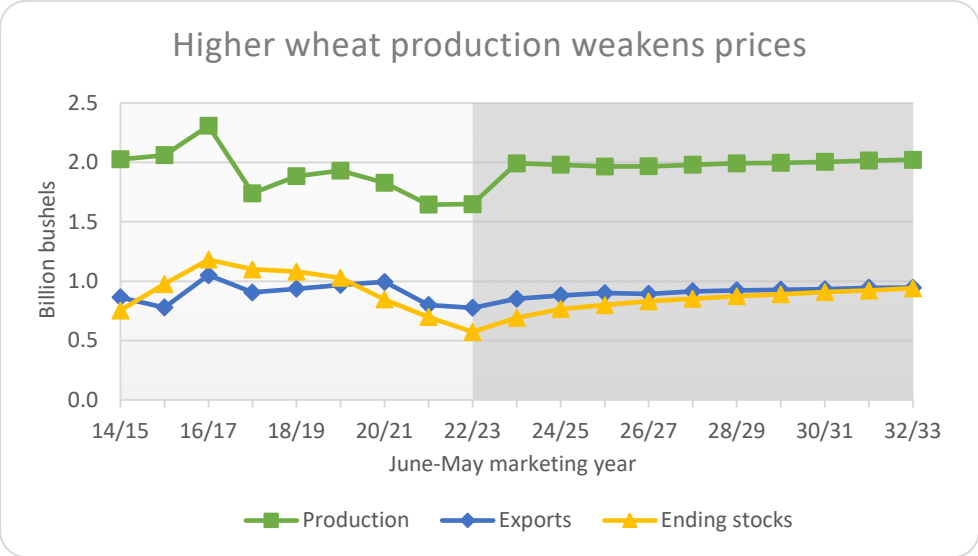


Distillers dried grains with solubles (DDGS) production follows the trajectory of dry mill ethanol production and averages about 40.5 million tons over the projection period. Along with flat production going forward, domestic use of DDGS and net exports remain roughly constant in the projection period.



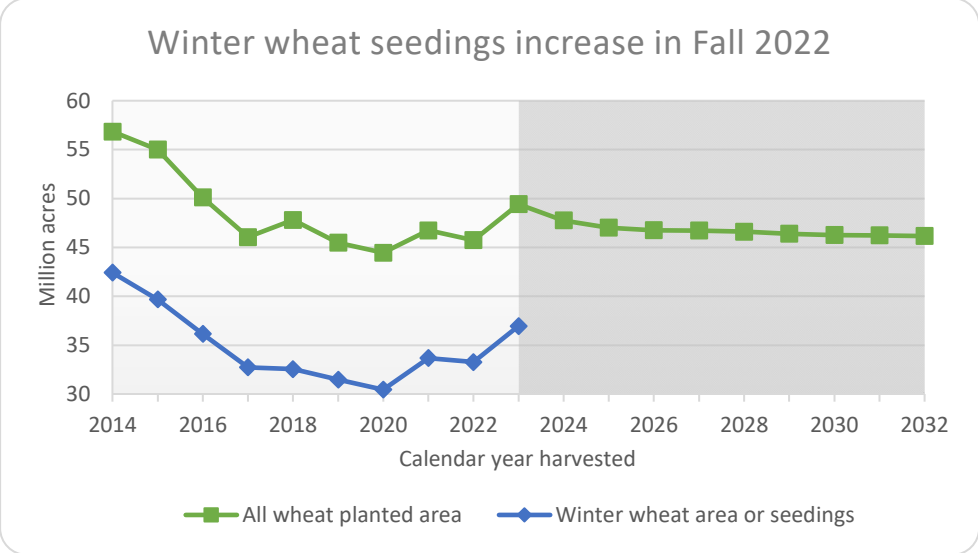
Following three consecutive years of higher prices, DDGS prices are projected to increase yet again in 2022/23 to a recent high of $247/ton before trending lower for the rest of the projection period. The price ratio between DDGS and corn holds steady but at a tighter relationship than what has tended to occur in the past. The ratio of corn gluten feed to the corn price also remains steady.



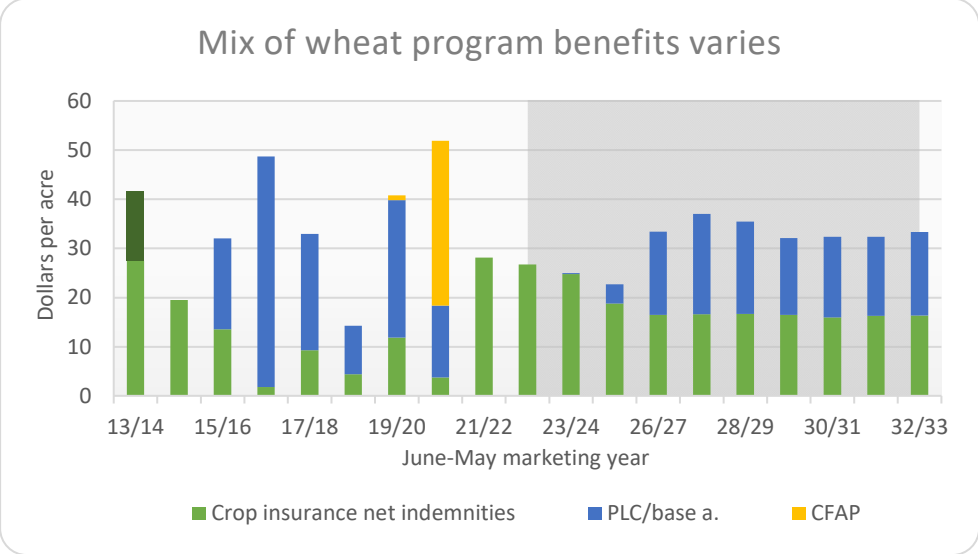


Wheat

Higher wheat area combined with a projected return to trend yields in 2022/23 leads to a large production increase (20%) from 2022/23. Even with rising domestic use and exports, U.S. price declines. With relatively modest increases in domestic use and exports in the baseline, ending stocks and the stocks-to-use ratio rise, keeping downward pressure on wheat prices.



Higher wheat prices in 2022 supported autumn wheat seedings, contributing to higher total wheat area harvested for 2023/24. As much of U.S. winter wheat area is still in drought conditions across the Plains states, there remains a large risk for winter wheat area abandonment and lower yields. With U.S. wheat farm price projected to decline through the baseline, all wheat area decreases in latter years.

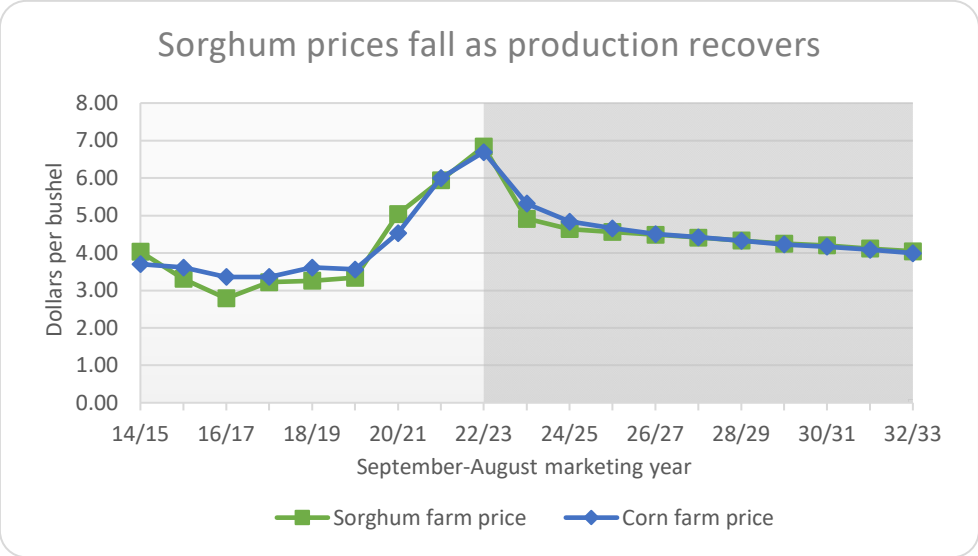


Crop insurance net indemnities averaged $6/acre from 2016/17 to 2020/21 and increase to about $17/acre over the next 10 years. For PLC participants, the payments were large between 2015/16 and 2020/21 but are effectively zero between 2021/22 and 2023/24. In later years, PLC payments could increase as average market prices fall below the effective reference price. The effective reference price rises above the minimum in 2025/26 and later years as historical prices trigger an increase.

Sorghum

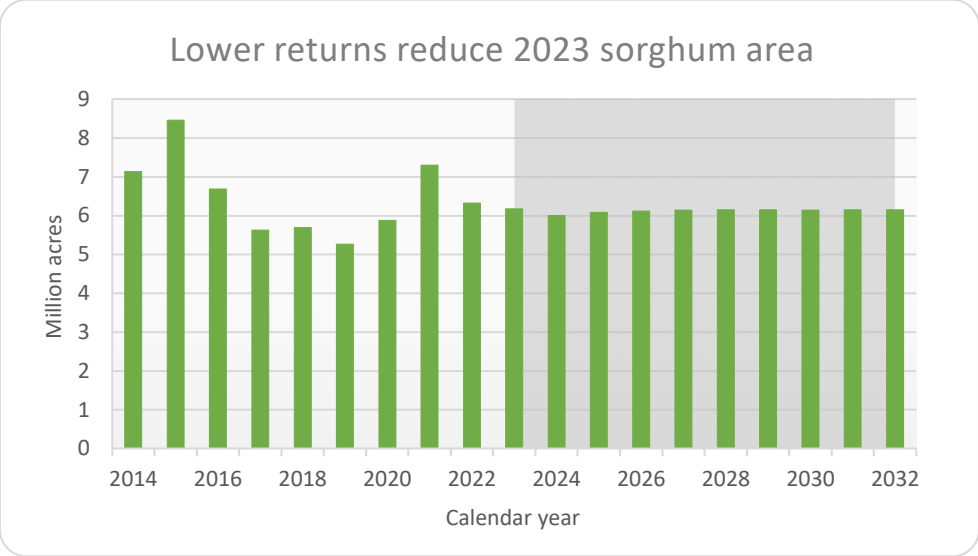
Sorghum prices in 2022/23 are projected to exceed corn prices again. Drought had a significant negative impact on yields and harvested area resulting in the lowest production in over 20 years.

Exports in 2022/23 are projected sharply lower, down 66% from the previous marketing year as a result of lower supplies and higher prices. Over the medium term, sorghum and corn prices converge and trend downward.



Sorghum area in 2023 is projected to fall slightly to 6.2 million acres as expected returns are projected to be lower than they were in 2022.

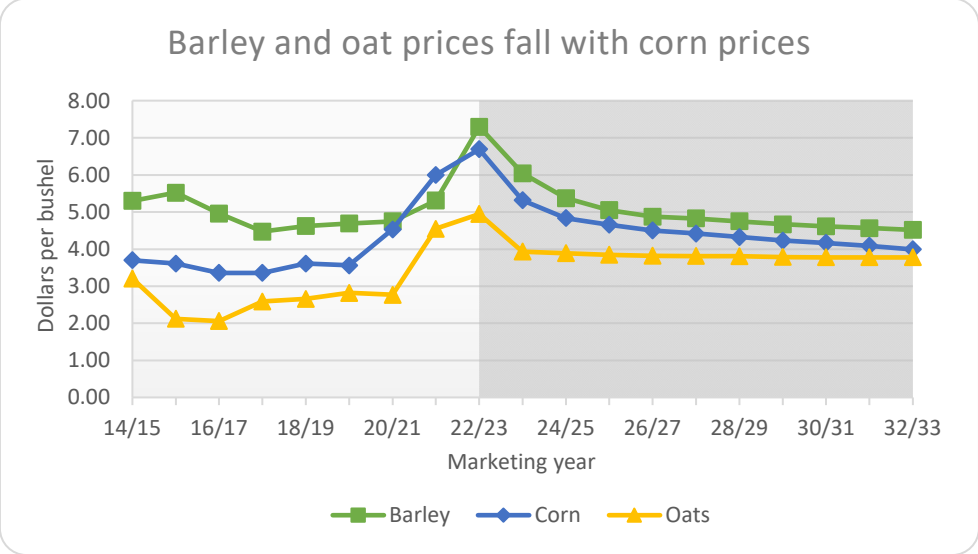
This slight decline in area and an assumed return to trend-level yield leads production to rapidly recover. As supplies increase and prices fall, exports increase to over 200 million bushels in 2023/24. Longer term, exports are projected to average 250 million bu./year. Exports are a major source of sorghum demand and Chinese trade policy is likely to influence future area.

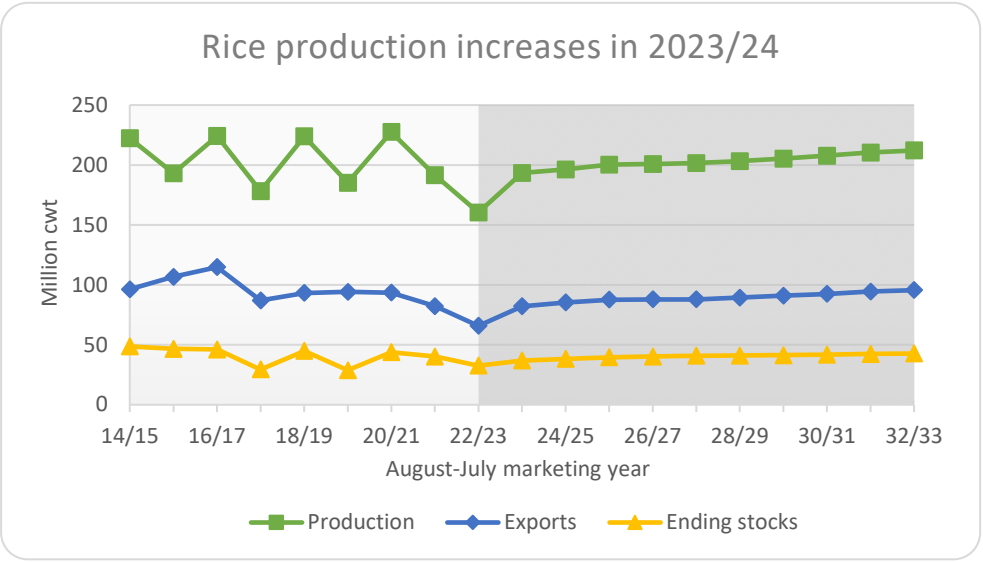


Barley and oats

Most U.S. barley is used for malting and thus can sell at a significant premium to feed grains. Domestic demand is projected to be relatively steady with yield gains offsetting declines in area over the projection period. Stocks build from 2021/22 lows as prices decline.

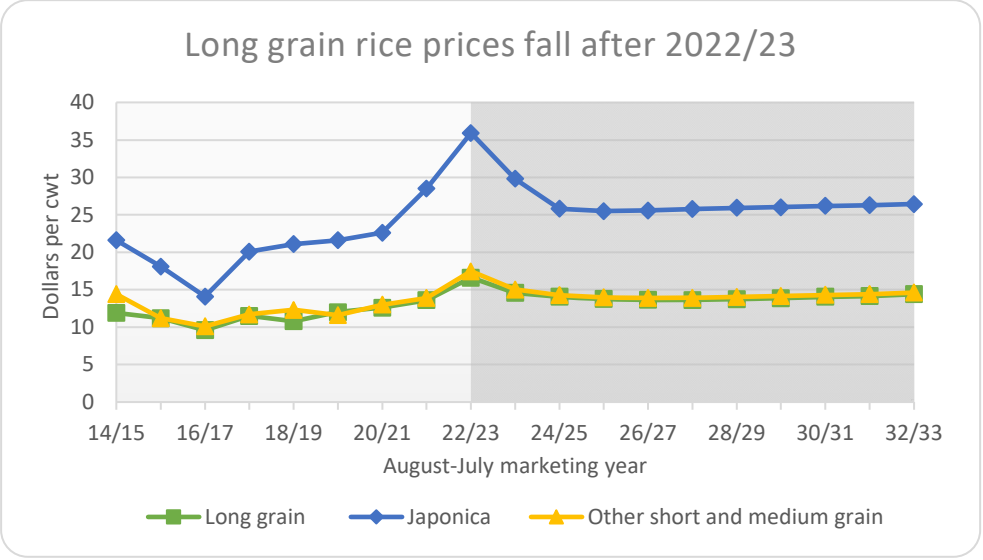
Oat prices are projected to fall initially alongside other feed grains before remaining steady at under $4/bu. Increasing production, from both higher area and yields, combined with mostly steady domestic demand lead to steadily declining imports over the projection period.



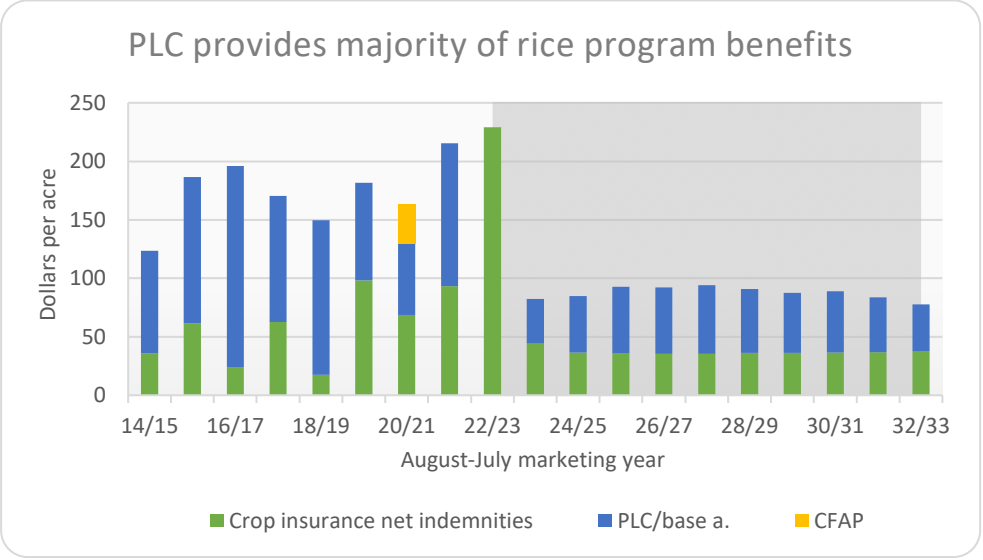


Rice

U.S. rice production for the 2023/24 marketing year is projected to increase with area and yields returning near the 2021/22 levels. Area and production declined in 2022, due in part to higher input costs, strong competition from other crops and drought in major rice-growing states. Exports also recover in 2023/24 and then increase slightly. The water situation in California will result in more variability in rice production than these average projections indicate.



Lower production and lower stocks drove prices up in 2022/23, especially for Japonica rice, but also for both long grain and other medium and short grain. A recovery in production in 2023/24 reduces prices and increases stocks. Combined rice exports rebound as prices fall the next few years with rising export demand supporting prices toward the end of the baseline. U.S. rice prices remain above international indicator prices but the gap narrows over the next few years.



Crop insurance net indemnities hit a new record in 2022/23 at $229/acre as drought conditions negatively affected both planted area and yields. Over half of the rice indemnities went to California with other states receiving much less. Crop insurance net indemnities draw closer to a more historical average of $37/acre after 2023/24. PLC payments make up the majority of the remainder of support to rice producers. Projected PLC payments are at least 2.5 times larger than ARC payments throughout the baseline period, leading to over 97% participation in PLC.

Corn supply and use

September-August year	22/23	23/24	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33
Area					(Million acres)						
Planted area	88.6	92.2	92.9	92.5	92.1	90.8	90.0	89.4	88.8	88.3	87.9
Harvested area	79.2	84.3	84.8	84.5	84.2	82.9	82.2	81.7	81.1	80.6	80.2
					(Bushels per harvested acre)						
Yield	173.3	181.0	183.0	185.1	187.4	189.5	191.7	193.7	195.8	197.6	199.2
					(Million bushels)						
Supply	15,157	16,536	17,321	17,787	18,077	18,159	18,257	18,402	18,538	18,678	18,818
Beginning stocks	1,377	1,243	1,766	2,120	2,270	2,403	2,466	2,546	2,626	2,710	2,800
Production	13,730	15,259	15,521	15,633	15,774	15,722	15,757	15,822	15,878	15,934	15,984
Imports	50	34	34	34	34	34	34	34	34	34	34
Domestic use	11,984	12,421	12,613	12,696	12,769	12,786	12,824	12,882	12,926	12,963	12,995
Feed and residual	5,270	5,572	5,688	5,738	5,796	5,820	5,853	5,891	5,924	5,962	5,997
Ethanol and coproducts	5,281	5,384	5,435	5,461	5,460	5,444	5,435	5,440	5,440	5,430	5,417
HFCS	410	401	404	395	393	389	387	387	384	379	375
Seed	31	31	31	32	31	31	31	31	32	32	32
Food and other	992	1,033	1,055	1,071	1,087	1,102	1,117	1,132	1,146	1,160	1,174
Exports	1,930	2,349	2,588	2,821	2,905	2,907	2,887	2,894	2,902	2,915	2,921
Total use	13,913	14,770	15,201	15,517	15,674	15,693	15,711	15,776	15,828	15,878	15,916
Ending stocks	1,243	1,766	2,120	2,270	2,403	2,466	2,546	2,626	2,710	2,800	2,902
Under loan	27	63	82	89	96	99	104	108	112	116	121
Other stocks	1,217	1,703	2,038	2,180	2,308	2,367	2,443	2,519	2,599	2,684	2,781
Prices, program provisions					(Dollars per bushel)						
Farm price	6.69	5.32	4.84	4.66	4.50	4.42	4.33	4.23	4.17	4.09	3.99
Loan rate	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20	2.20
Effective reference price	3.70	3.70	4.01	4.24	4.25	4.24	4.14	3.98	3.90	3.85	3.81
					(Million acres)						
Base area	92.7	92.4	92.3	92.3	92.3	92.3	92.3	92.3	92.3	92.3	92.3
					(Bushels per acre)						
PLC program yield	132.2	131.7	126.3	124.9	123.8	123.6	129.5	128.6	128.3	128.1	127.9
					(Percent of base acres)						
PLC participation rate	40.3	37.5	19.7	19.8	15.5	14.9	28.7	28.6	28.1	28.1	28.5
ARC participation rate	59.7	62.5	80.3	80.2	84.5	85.1	71.3	71.4	71.9	71.9	71.5
Returns and payments					(Dollars)						
Gross market revenue/a.	1,159.86	958.63	881.04	858.50	841.38	833.95	826.41	816.74	813.17	804.58	792.74
Variable expenses/a.	474.61	474.92	428.27	399.76	395.35	406.70	415.09	418.16	419.60	422.57	427.69
Market net return/a.	685.26	483.71	452.76	458.73	446.03	427.24	411.31	398.58	393.56	382.02	365.05
Marketing loan benefits/a.*	0.00	0.00	0.03	0.08	0.10	0.05	0.15	0.10	0.26	0.33	0.30
Payments to participants											
PLC/base a.*	0.00	0.28	9.03	19.36	26.52	31.67	29.03	26.46	23.93	25.16	29.35
ARC/base a.*	0.01	0.51	12.56	25.99	37.64	45.69	35.30	24.39	22.01	21.71	20.61
Insurance net indemnities/a.*	26.72	39.20	31.42	31.37	29.87	29.22	30.28	29.38	28.61	29.10	29.23

* Marketing loan benefits and insurance net indemnities are averaged across all acres. ARC and PLC payments are per participating acre.
All projections are averages across 500 stochastic outcomes.

Corn product supply and use

Marketing year	22/23	23/24	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33
High-fructose corn syrup				(Thousand tons, October-September year)							
Production	7,470	7,328	7,394	7,236	7,229	7,158	7,139	7,156	7,119	7,034	6,971
Domestic use	6,436	6,259	6,312	6,071	6,051	5,937	5,890	5,898	5,821	5,739	5,679
Net exports	1,033	1,069	1,081	1,165	1,179	1,221	1,249	1,259	1,298	1,295	1,292
				(Cents per pound, October-September year)							
Price, 42% Midwest	36.16	34.81	35.14	33.83	34.85	34.45	34.64	34.87	34.60	34.23	34.29
Distillers, brewers grains				(Thousand tons, September-August year)							
Production (dry equivalent basis)	40,274	40,509	40,617	40,672	40,596	40,476	40,447	40,535	40,586	40,558	40,496
Domestic use	27,841	27,811	27,829	27,821	27,711	27,554	27,489	27,536	27,549	27,484	27,380
Net exports	12,432	12,698	12,787	12,850	12,885	12,922	12,958	12,999	13,037	13,074	13,116
				(Dollars per ton, September-August year)							
Price, IL points	247.28	199.11	183.66	176.77	172.64	170.15	167.79	164.78	162.91	160.54	157.46
Corn gluten feed				(Thousand tons, September-August year)							
Production	8,388	8,883	9,202	9,309	9,407	9,445	9,485	9,528	9,551	9,544	9,549
Domestic use	7,766	8,048	8,336	8,441	8,542	8,587	8,636	8,687	8,721	8,725	8,741
Net exports	622	835	867	868	866	857	849	841	830	818	808
				(Dollars per ton, September-August year)							
Price, 21%, IL points	200.03	161.36	150.44	145.80	142.56	140.68	138.84	136.67	135.30	133.65	131.57
Corn gluten meal				(Thousand tons, September-August year)							
Production	2,207	2,338	2,422	2,450	2,476	2,485	2,496	2,507	2,513	2,512	2,513
Domestic use	1,448	1,528	1,595	1,609	1,624	1,623	1,623	1,624	1,620	1,609	1,600
Net exports	760	809	826	841	852	863	873	883	893	903	913
				(Dollars per ton, September-August year)							
Price, 60%, IL points	592.39	496.72	472.64	453.79	447.08	441.15	437.97	432.26	428.12	423.42	416.43
Corn oil				(Million pounds, October-September year)							
Production	6,200	6,544	6,854	7,094	7,246	7,355	7,436	7,529	7,586	7,630	7,621
Domestic use	6,144	6,497	6,794	7,021	7,202	7,320	7,411	7,507	7,579	7,635	7,648
Biodiesel	3,056	3,892	4,584	4,670	4,956	5,218	5,342	5,484	5,603	5,721	5,812
Food/other	3,087	2,605	2,210	2,351	2,246	2,102	2,069	2,023	1,976	1,914	1,836
Net exports	73	31	43	59	39	31	22	18	6	-5	-23
Ending stocks	76	91	108	122	126	130	132	136	137	137	133
				(Cents per pound, October-September year)							
Chicago price	64.38	66.64	66.91	66.70	68.60	69.91	71.39	72.56	74.30	76.09	78.39

All projections are averages across 500 stochastic outcomes.

Wheat supply and use

June-May year	22/23	23/24	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33
Area					(Million acres)						
Planted area	45.7	49.4	47.8	47.0	46.7	46.7	46.6	46.4	46.3	46.2	46.2
Harvested area	35.5	38.9	38.7	38.1	37.7	37.7	37.5	37.3	37.1	37.0	36.9
					(Bushels per harvested acre)						
Yield	46.5	51.2	51.2	51.7	52.1	52.6	53.1	53.6	54.0	54.5	54.8
					(Million bushels)						
Supply	2,466	2,675	2,777	2,833	2,866	2,912	2,945	2,969	2,995	3,023	3,045
Beginning stocks	698	572	691	765	799	830	852	873	890	908	922
Production	1,650	1,993	1,982	1,966	1,967	1,982	1,993	1,997	2,005	2,016	2,023
Imports	117	110	104	102	100	100	100	99	99	99	99
Domestic use	1,118	1,132	1,132	1,134	1,143	1,145	1,148	1,151	1,154	1,156	1,158
Feed and residual	78	93	86	84	87	85	85	85	85	83	82
Seed	65	63	62	61	61	61	61	60	60	60	60
Food and other	975	977	984	989	995	999	1,002	1,006	1,009	1,013	1,016
Exports	775	852	880	901	893	915	923	928	933	945	946
Total use	1,893	1,984	2,012	2,035	2,036	2,060	2,071	2,079	2,087	2,101	2,104
Ending stocks	572	691	765	799	830	852	873	890	908	922	941
Under loan	2	6	9	10	11	12	13	13	14	14	15
Other stocks	571	685	756	789	819	840	860	877	894	908	926
Prices, program provisions					(Dollars per bushel)						
Farm price	9.08	7.39	6.60	6.29	5.99	5.90	5.77	5.66	5.59	5.52	5.43
Loan rate	3.38	3.38	3.38	3.38	3.38	3.38	3.38	3.38	3.38	3.38	3.38
Effective reference price	5.50	5.50	5.50	5.72	6.03	6.11	5.90	5.70	5.61	5.58	5.56
					(Million acres)						
Base area	61.1	60.5	60.4	60.4	60.3	60.3	60.3	60.3	60.3	60.3	60.3
					(Bushels per acre)						
PLC program yield	39.2	38.7	38.6	38.1	39.1	39.3	38.8	39.0	39.4	39.6	39.8
					(Percent of base acres)						
PLC participation rate	53.4	47.1	46.0	43.0	58.5	63.7	56.9	57.9	63.3	67.7	70.5
ARC participation rate	46.6	52.9	54.0	57.0	41.5	36.3	43.1	42.1	36.7	32.3	29.5
Returns and payments					(Dollars)						
Gross market revenue/a.	422.05	377.84	337.56	324.63	312.10	310.39	306.30	302.98	301.62	300.54	297.31
Variable expenses/a.	187.98	188.42	169.55	161.67	159.41	163.05	167.62	169.89	171.58	173.68	176.62
Market net return/a.	234.07	189.42	168.01	162.96	152.70	147.34	138.68	133.09	130.03	126.86	120.69
Marketing loan benefits/a.*	0.00	0.01	0.34	0.36	0.72	1.09	1.16	1.49	1.75	1.68	2.16
Payments to participants											
PLC/base a.*	0.00	0.22	3.90	8.04	16.90	20.47	18.82	15.65	16.46	16.10	17.03
ARC/base a.*	0.17	0.61	3.94	8.86	12.71	14.05	13.25	11.08	9.76	9.31	9.24
Insurance net indemnities/a.*	26.73	24.78	18.79	17.12	16.49	16.58	16.66	16.46	15.93	16.26	16.32

* Marketing loan benefits and insurance net indemnities are averaged across all acres. ARC and PLC payments are per participating acre.
All projections are averages across 500 stochastic outcomes.

Sorghum supply and use

September-August year	22/23	23/24	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33
Area					(Million acres)						
Planted area	6.33	6.18	6.01	6.08	6.12	6.15	6.15	6.15	6.15	6.15	6.16
Harvested area	4.57	5.44	5.30	5.36	5.39	5.43	5.43	5.44	5.43	5.43	5.46
					(Bushels per harvested acre)						
Yield	41.1	72.0	72.2	72.5	73.0	73.3	73.6	73.9	74.3	74.2	74.2
Supply and use					(Million bushels)						
Production	188	392	384	390	394	398	401	402	404	404	406
Imports	0	0	0	0	0	0	0	0	0	0	0
Domestic use	107	166	147	143	139	143	146	149	151	153	155
Exports	103	209	234	246	253	255	253	252	251	250	249
Ending stocks	25	42	45	46	48	48	50	51	53	54	56
Prices, returns and payments					(Dollars)						
Farm price/bu.	6.84	4.91	4.64	4.56	4.49	4.41	4.33	4.25	4.20	4.12	4.04
Effective reference price	3.95	3.95	4.06	4.42	4.48	4.42	4.22	4.06	4.03	4.01	4.00
Market net return/a.	89.32	157.49	157.53	164.50	161.46	152.17	143.99	136.50	133.24	124.75	115.20
Marketing loan benefits/a.*	0.00	0.00	0.16	0.10	0.01	0.06	0.08	0.01	0.03	1.04	1.50
Payments to participants											
PLC/base a.*	0.00	2.47	8.15	16.44	20.02	19.98	17.08	13.38	14.79	15.78	16.99
ARC/base a.*	1.24	1.56	8.90	12.22	13.51	13.11	9.72	8.76	8.62	9.02	8.89
Insurance net indemnities/a.*	85.55	27.72	21.04	18.81	18.24	18.72	19.91	18.62	18.22	19.88	20.07

* Marketing loan benefits and insurance net indemnities are averaged across all acres. ARC and PLC payments are per participating acre.
All projections are averages across 500 stochastic outcomes.

Barley supply and use

June-May year	22/23	23/24	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33
Area					(Million acres)						
Planted area	2.95	2.83	3.04	2.85	2.77	2.71	2.67	2.65	2.61	2.58	2.55
Harvested area	2.43	2.31	2.47	2.31	2.24	2.19	2.17	2.14	2.12	2.09	2.07
					(Bushels per harvested acre)						
Yield	71.7	77.3	77.9	78.9	80.0	81.1	82.3	83.2	84.2	84.9	85.8
Supply and use					(Million bushels)						
Production	174	178	192	183	179	178	179	179	178	177	177
Imports	15	13	12	10	11	11	12	12	13	13	14
Domestic use	166	171	182	181	182	182	183	183	184	183	184
Exports	5	6	6	7	7	7	6	6	6	6	6
Ending stocks	60	74	90	95	97	98	99	100	101	102	103
Prices, returns and payments					(Dollars)						
All barley farm price/bu.	7.30	6.04	5.37	5.05	4.88	4.83	4.75	4.67	4.61	4.57	4.52
Feed barley price/bu.	5.94	4.79	4.28	4.07	3.92	3.86	3.79	3.71	3.66	3.60	3.54
Effective reference price	4.95	4.95	4.95	4.95	5.00	5.04	5.04	4.97	4.95	4.95	4.95
Market net return/a.	316.97	259.92	232.75	223.53	217.43	214.36	210.35	206.79	205.03	202.26	199.58
Marketing loan benefits/a.*	0.00	0.00	0.17	0.29	0.38	0.41	0.62	0.73	0.98	0.15	0.09
Payments to participants											
PLC/base a.*	0.00	1.23	7.94	13.76	17.26	21.45	23.66	21.84	23.19	24.41	26.03
ARC/base a.*	0.00	0.56	3.00	7.72	9.50	10.93	13.33	10.53	9.52	9.12	9.65
Insurance net indemnities/a.*	18.06	15.05	13.08	12.28	11.73	12.07	12.13	12.18	11.90	12.23	12.16

* Marketing loan benefits and insurance net indemnities are averaged across all acres. ARC and PLC payments are per participating acre.
All projections are averages across 500 stochastic outcomes.

Oats supply and use

June-May year	22/23	23/24	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33
Area					(Million acres)						
Planted area	2.58	2.51	2.65	2.73	2.81	2.87	2.91	2.95	2.98	3.01	3.04
Harvested area	0.89	0.79	0.84	0.87	0.89	0.91	0.93	0.94	0.95	0.96	0.97
					(Bushels per harvested acre)						
Yield	64.8	67.3	67.7	68.1	68.7	69.3	70.0	70.5	71.0	71.5	71.9
Supply and use					(Million bushels)						
Production	58	54	57	59	62	64	65	67	68	69	70
Imports	87	88	86	84	83	82	81	79	78	77	77
Domestic use	144	139	139	140	141	142	142	143	143	143	143
Exports	3	3	3	3	3	3	3	3	3	3	3
Ending stocks	31	31	32	33	34	35	36	37	38	39	39
Prices, returns and payments					(Dollars)						
Farm price/bu.	4.95	3.93	3.89	3.85	3.82	3.81	3.81	3.79	3.78	3.78	3.78
Effective reference price/bu.	2.40	2.40	2.76	2.76	2.76	2.76	2.76	2.76	2.76	2.76	2.76
Market net return/a.	138.21	82.60	98.22	104.23	106.09	103.09	101.58	100.23	100.52	100.42	99.20
Marketing loan benefits/a.*	0.00	0.04	0.06	0.07	0.08	0.08	0.09	0.09	0.10	0.00	0.00
Payments to participants											
PLC/base a.*	0.00	0.00	0.21	0.17	0.12	0.14	0.24	0.26	0.26	0.31	0.21
ARC/base a.*	0.00	0.18	0.77	1.54	2.60	2.79	2.79	2.01	2.12	2.02	2.12
Insurance net indemnities/a.*	1.66	2.84	2.51	2.57	2.52	2.48	2.47	2.58	2.46	2.53	2.50

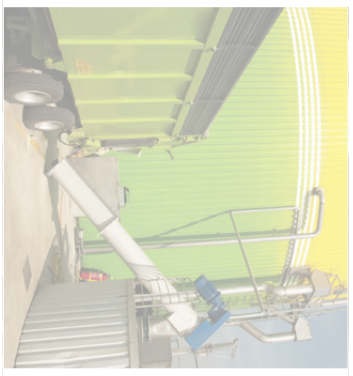
* Marketing loan benefits and insurance net indemnities are averaged across all acres. ARC and PLC payments are per participating acre.
All projections are averages across 500 stochastic outcomes.

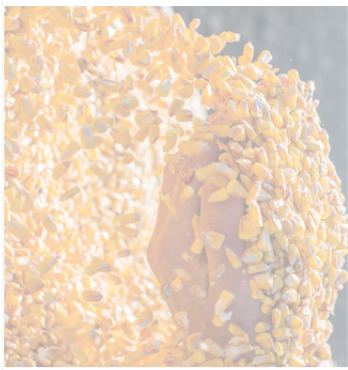
Rice supply and use

August-July year	22/23	23/24	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33
Area					(Million acres)						
Planted area	2.22	2.55	2.55	2.58	2.57	2.56	2.56	2.57	2.59	2.61	2.61
Harvested area	2.17	2.51	2.51	2.54	2.53	2.52	2.52	2.53	2.55	2.56	2.57
Yield	7,383	7,716	7,822	7,884	7,945	8,006	8,055	8,113	8,164	8,209	8,254
Supply and use					(Million hundredweight)						
Production	160.4	193.4	196.2	200.2	200.8	201.6	203.2	205.4	207.8	210.4	212.1
Imports	45.0	41.5	41.4	41.4	41.6	41.9	42.2	42.6	43.0	43.4	43.9
Domestic use	147.1	148.6	151.1	152.7	153.8	154.9	155.8	156.8	157.9	158.8	160.0
Exports	65.9	82.1	85.2	87.7	87.9	88.0	89.4	90.9	92.4	94.4	95.7
Ending stocks	32.6	36.8	38.2	39.5	40.1	40.8	40.9	41.2	41.7	42.3	42.6
Program provisions					(Dollars per hundredweight)						
Loan rate	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00
Effective reference price											
Long grain	14.00	14.00	14.00	14.00	14.00	14.00	14.01	14.00	14.00	14.00	14.00
Japonica	17.30	17.30	17.30	17.30	17.30	17.30	17.30	17.30	17.30	17.30	17.30
Other medium/short	14.00	14.00	14.00	14.00	14.00	14.00	14.00	14.00	14.00	14.00	14.00
Base area					(Million acres)						
Long grain	3.76	3.72	3.72	3.72	3.72	3.72	3.72	3.72	3.72	3.72	3.72
Medium/short	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44
PLC yield					(Pounds per acre)						
Long grain	5,818	5,672	5,780	5,821	5,867	5,881	5,861	5,855	5,849	5,840	5,831
Medium/short	6,841	6,909	6,870	6,681	6,509	6,515	6,656	6,742	6,750	6,754	6,748
PLC participation rate					(Percent of base acres)						
Long grain	99.3	98.4	98.8	98.7	98.6	98.5	98.3	98.4	98.4	98.5	98.5
Medium/short	81.7	92.0	86.1	67.1	54.7	54.2	64.5	71.9	72.6	72.9	72.4
ARC participation rate											
Long grain	0.7	1.6	1.2	1.3	1.4	1.5	1.7	1.6	1.6	1.5	1.5
Medium/short	18.3	8.0	13.9	32.9	45.3	45.8	35.5	28.1	27.4	27.1	27.6
Prices, returns and payments					(Dollars)						
Farm price/cwt	19.15	16.51	16.15	15.84	15.75	15.74	15.85	15.96	16.11	16.17	16.40
Long grain	16.61	14.59	14.07	13.76	13.66	13.62	13.73	13.89	14.07	14.16	14.41
Japonica	35.92	29.81	25.83	25.50	25.59	25.78	25.95	26.01	26.19	26.28	26.43
Other medium/short	17.46	15.04	14.28	13.99	13.91	13.91	14.02	14.14	14.32	14.40	14.63
Gross market revenue/a.	1,413.66	1,274.16	1,262.93	1,248.95	1,251.29	1,260.42	1,276.53	1,294.86	1,314.97	1,327.54	1,353.50
Variable expenses/a.	728.29	736.89	685.63	657.49	658.14	675.42	690.50	701.67	712.04	724.20	738.20
Market net return/a.	685.37	537.27	577.29	591.47	593.15	585.00	586.03	593.18	602.93	603.33	615.30
Marketing loan benefits/a.*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Payments to participants											
PLC/base a.*	0.00	38.09	48.43	56.85	56.74	58.62	54.72	51.38	52.26	46.73	40.54
ARC/base a.*	0.00	7.83	11.00	21.53	31.40	38.52	32.64	25.94	25.01	21.48	20.60
Insurance net indemnities/a.*	229.22	44.24	36.50	35.87	35.58	35.56	36.18	36.27	36.66	36.98	37.33

* Marketing loan benefits and insurance net indemnities are averaged across all acres. ARC and PLC payments are per participating acre.
All projections are averages across 500 stochastic outcomes.



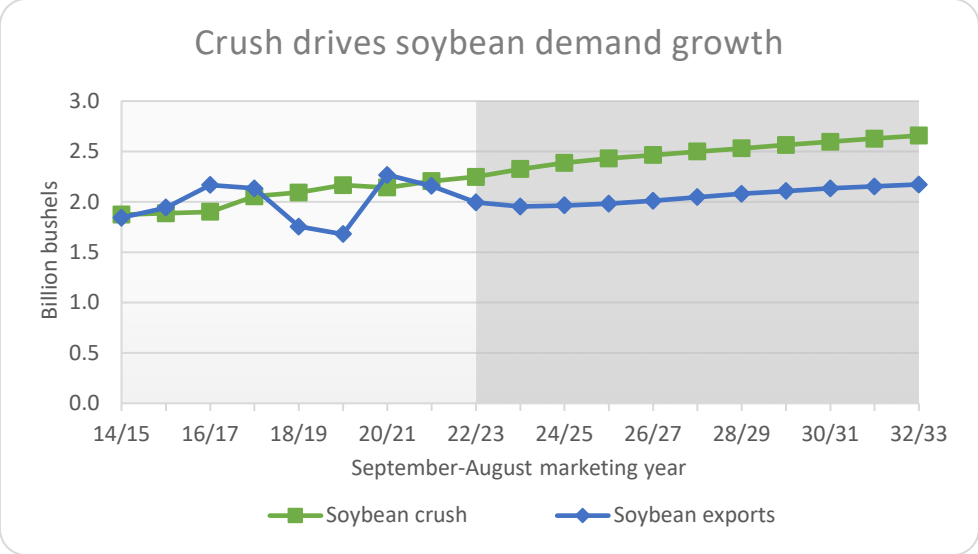


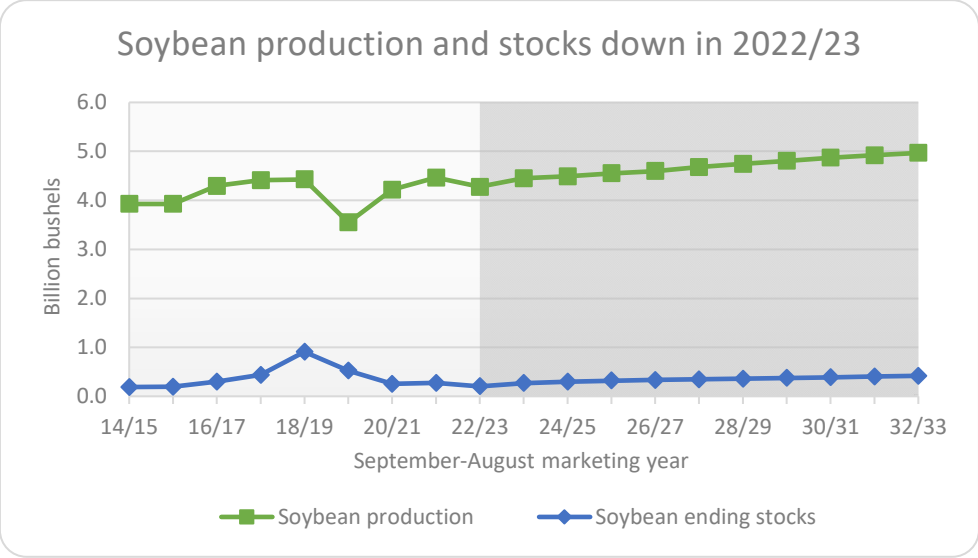
Oilseeds

Soybeans and products

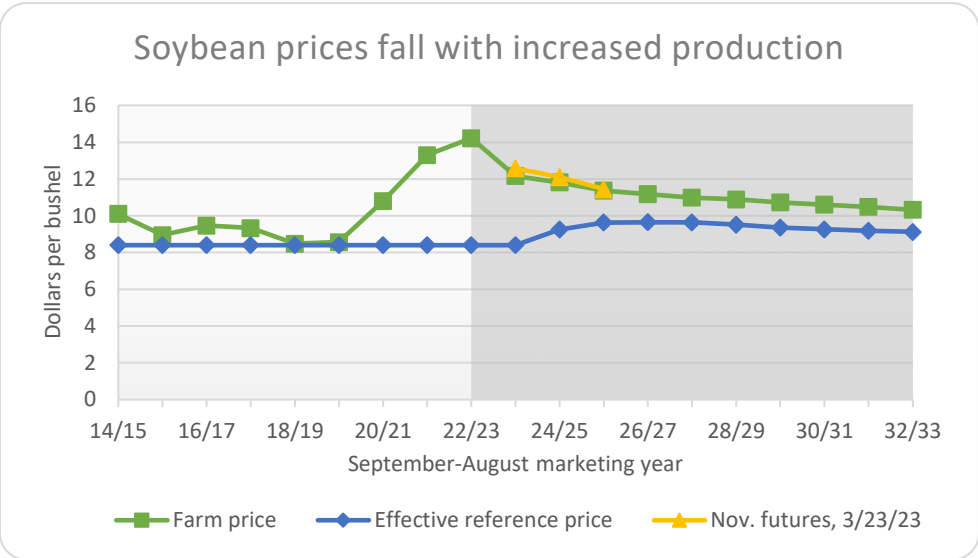
U.S. soybean crush capacity is increasing, contributing to an increase in domestic crush relative to soybean exports. After 2023/24, both crush and exports increase in response to growth in global demand and in domestic biofuel use of soybean oil. This growth in demand is one reason why soybean area is expanding at the expense of corn.

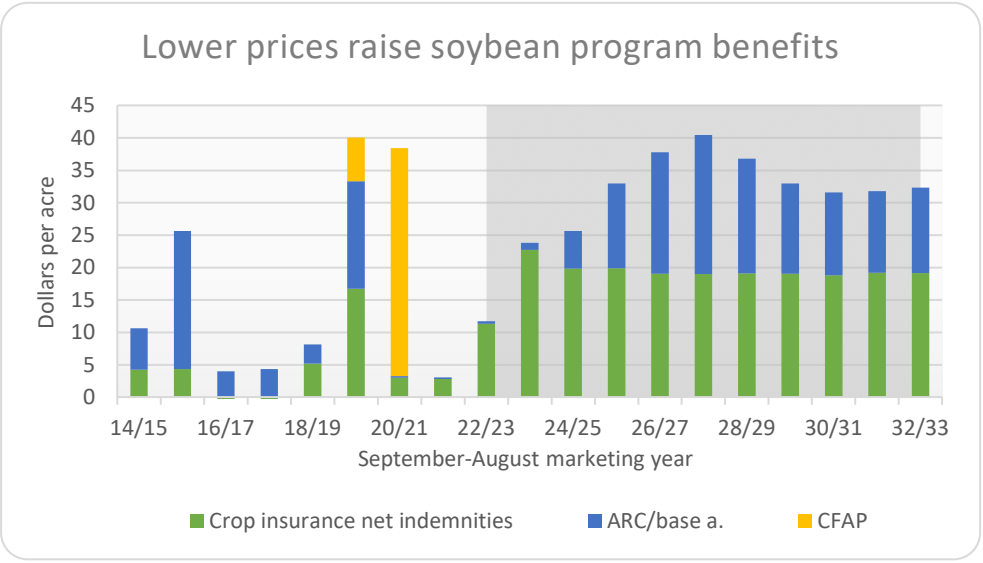


U.S. soybean production decreased in 2022 following a new record in 2021. The production decline was largely due to weaker yields from drought across the Plains and portions of the Midwest. At the same time, domestic crush remained steady, not entirely offset by a decline in exports, resulting in ending stocks hitting a 7-year low. Projected ending stocks improve modestly in 2023/24 as a return to trend yields improves domestic production.

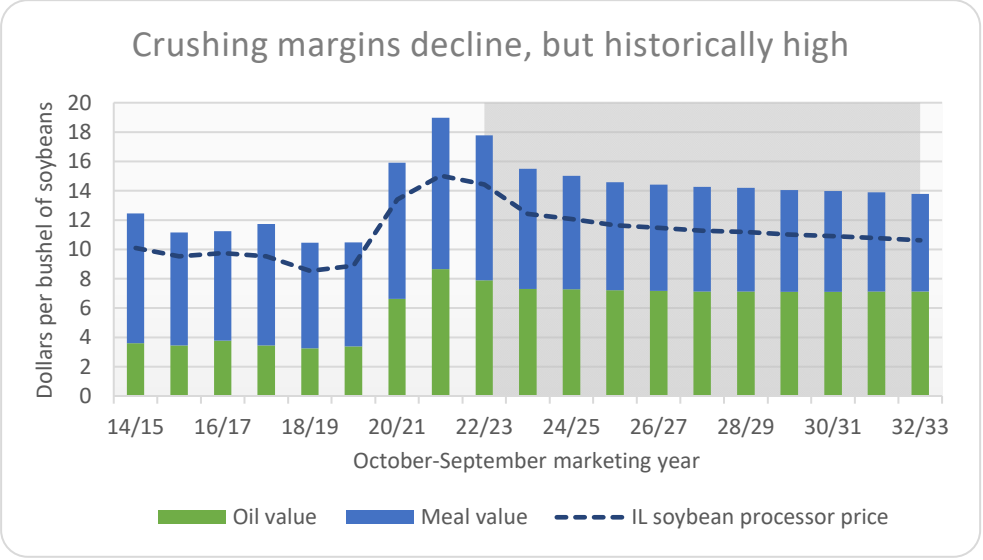


U.S. soybean prices exceed $14 in 2022/23 as a result of drought-weakened U.S. production. Increased production contributes to lower prices in 2023/24. The futures markets in March are consistent with these projections. Reduced Argentina production in 2023 would tend to increase prices, but other factors have countered this effect.

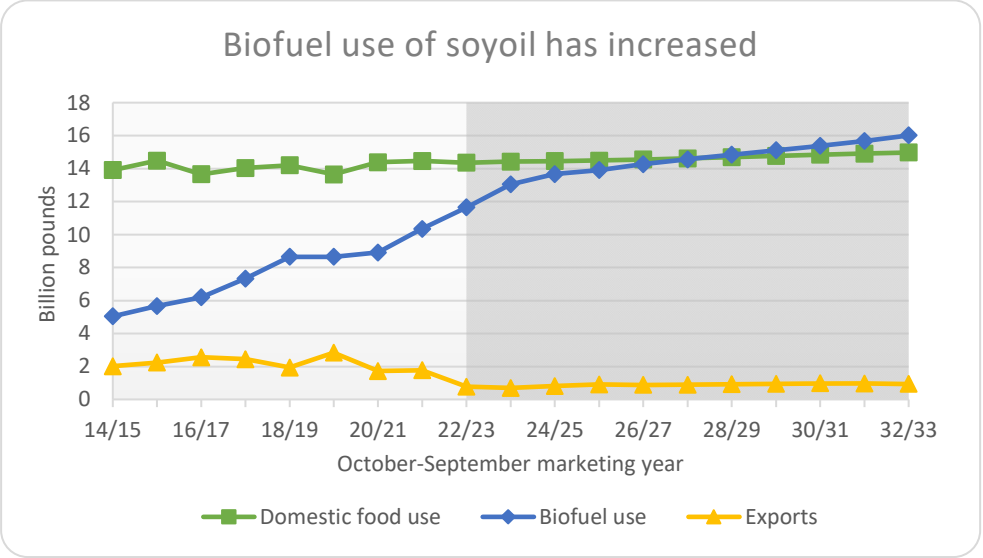




Soybean producers received smaller direct benefits from ARC, PLC and crop insurance in recent years than did producers of many other crops. In 2018/19 and 2019/20, however, they received large MFP payments (not shown in the chart), and coronavirus food assistance program (CFAP) payments exceeded $35/soybean acre in 2020/21. In the next couple projection years, both ARC and PLC payments are relatively modest. The projected crop insurance net indemnities assume a loss ratio of around 0.9, which is greater than it has been in most years.



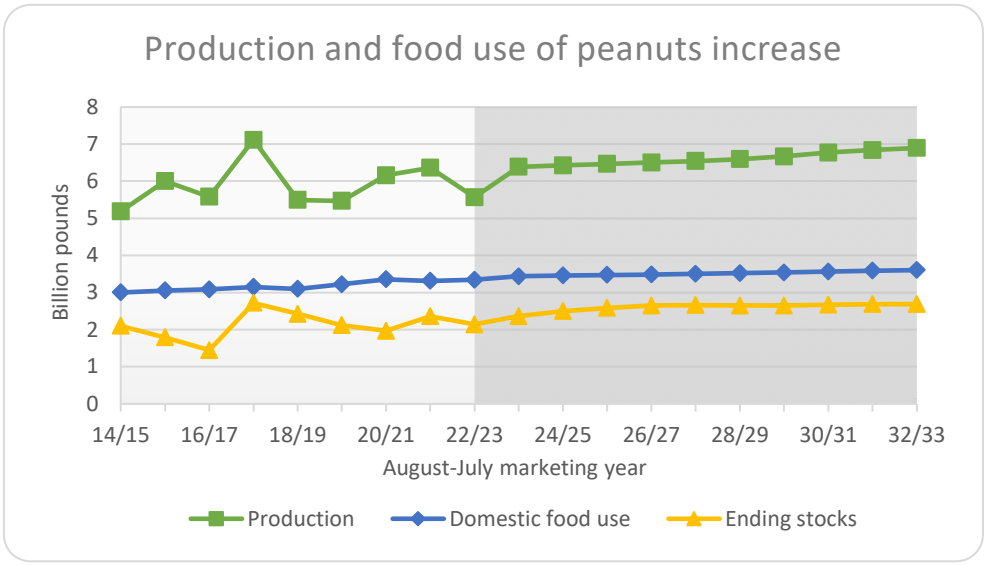
Processor prices for soybeans and soybean oil peaked in 2021/22, with the share of soybean oil value to crush values increasing to over 40%. This was a shift from about one-third of the crush value attributed to oil in the prior 5-year average. The increasing share of the value of soybean oil continues to climb in the projection period approaching 50% in the next few years. Rising demand for soybean oil heading to biofuel production is an important contributor to this shift in the value of soybean products in crush margins.



Between 2012/13 and 2020/21, biodiesel accounted for about 90% of the increase in U.S. soybean oil consumption. Further growth is projected, in large part due to increased renewable diesel production, whereas only minimal expansion from food and other domestic uses contribute to soybean oil consumption growth. U.S. soybean oil exports remain modest, as Argentina exports of soybean oil and Asian palm oil exports continue to dominate global vegetable oil trade.

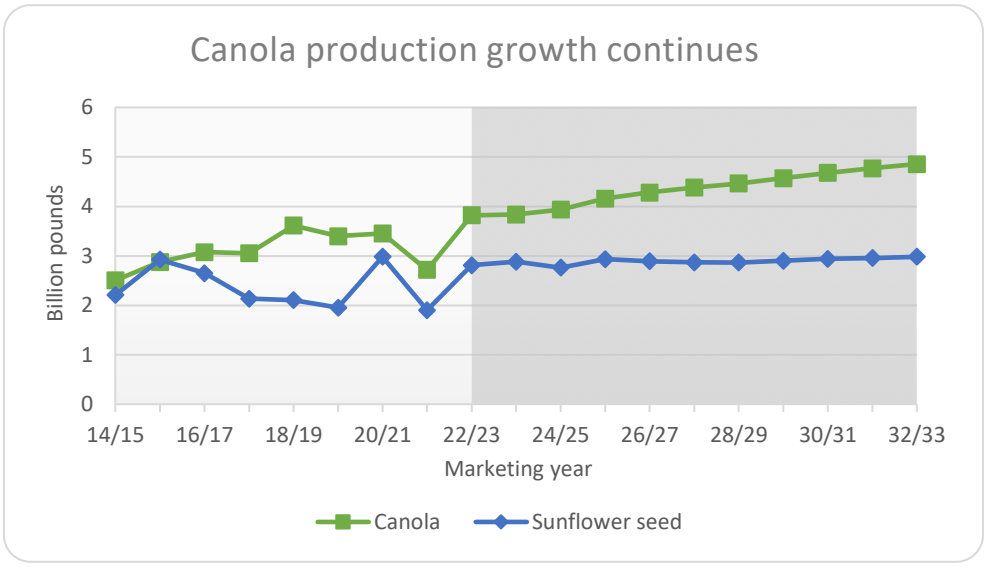
Peanuts

Fewer planted acres combined with negative weather impacts on yields contributed in 2022/23 to the smallest U.S. production in three years. Despite less domestic production and an increase in food use of peanuts, U.S. peanut prices reached $544/ton, its highest in 10 years. Area and yields recover in 2023/24, increasing production enough to outpace the increase in consumption. Prices decline to average about $460/ton (23 cents/lb) through the baseline.

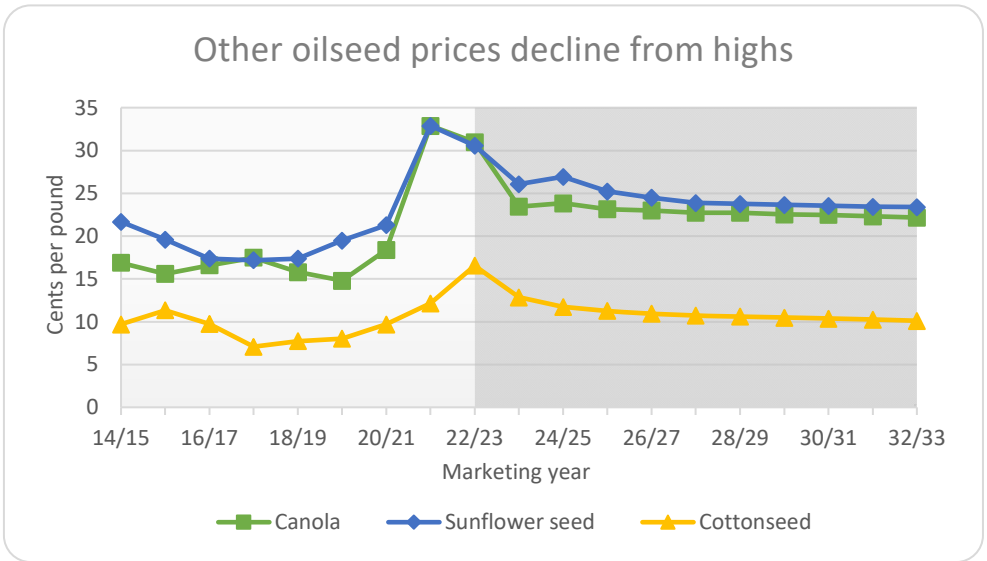


Other oilseeds

U.S. production of canola experienced strong growth and now consistently exceeds production of sunflowers. After drought conditions in the Northern Plains led to weaker canola production in 2021/22, area and yields recovered. With an approved pathway, the addition of canola oil as a potential source for renewable diesel increases demand for canola and supports more U.S. canola area through the projection period.



The impacts of the 2021 drought stretched across the U.S. Northern Plains and the Canadian Prairies. The effect decreased U.S. sunflower seed and canola production as well as dramatically reducing Canada's canola production. Even though drought conditions improved in 2022/23 for the Northern Plains and Canada, it worsened in other parts of the United States. Spillover price pressure supported canola and sunflower seed prices for a second year. Moving forward, prices for other oilseeds ease as a return closer to average conditions draws yields back to trend.



Soybean supply and use

September-August year	22/23	23/24	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33
Area					(Million acres)						
Planted area	87.5	87.2	87.2	87.4	87.2	87.9	88.2	88.4	88.5	88.6	88.7
Harvested area	86.3	86.3	86.3	86.5	86.4	87.1	87.3	87.5	87.7	87.7	87.8
					(Bushels per harvested acre)						
Yield	49.5	51.6	52.1	52.6	53.2	53.8	54.3	54.9	55.6	56.1	56.6
					(Million bushels)						
Supply	4,566	4,674	4,779	4,869	4,939	5,028	5,110	5,184	5,262	5,327	5,391
Beginning stocks	274	206	271	300	326	333	349	362	375	392	406
Production	4,276	4,453	4,492	4,554	4,598	4,681	4,746	4,807	4,872	4,920	4,970
Imports	15	15	15	15	15	15	15	15	15	15	15
Domestic use	2,366	2,450	2,514	2,561	2,597	2,633	2,668	2,702	2,736	2,769	2,800
Crush	2,246	2,325	2,387	2,431	2,464	2,498	2,531	2,563	2,596	2,626	2,656
Seed and residual	120	125	127	130	133	135	137	139	141	142	144
Exports	1,993	1,953	1,964	1,982	2,010	2,046	2,080	2,107	2,133	2,152	2,171
Total use	4,360	4,403	4,478	4,543	4,607	4,680	4,748	4,809	4,870	4,921	4,971
Ending stocks	206	271	300	326	333	349	362	375	392	406	420
Under loan	5	11	13	16	17	18	19	21	22	24	25
Other stocks	201	260	287	310	316	330	342	354	370	382	394
Prices, program provisions					(Dollars per bushel)						
Farm price	14.23	12.17	11.82	11.37	11.18	10.99	10.89	10.73	10.61	10.48	10.33
Illinois processor price	14.43	12.42	12.09	11.65	11.47	11.28	11.19	11.02	10.91	10.79	10.64
Loan rate	6.20	6.20	6.20	6.20	6.20	6.20	6.20	6.20	6.20	6.20	6.20
Effective reference price	8.40	8.40	9.26	9.63	9.65	9.64	9.52	9.35	9.26	9.18	9.12
					(Million acres)						
Base area	52.5	52.3	52.3	52.2	52.2	52.2	52.2	52.2	52.2	52.2	52.2
					(Bushels per acre)						
PLC program yield	39.9	39.4	38.9	38.1	37.7	37.5	38.2	38.5	38.6	38.6	38.5
					(Percent of base acres)						
PLC participation rate	15.6	21.4	13.6	9.6	7.4	6.7	8.9	11.1	12.0	12.1	12.1
ARC participation rate	84.4	78.6	86.4	90.4	92.6	93.3	91.1	88.9	88.0	87.9	87.9
Returns and payments					(Dollars)						
Gross market revenue/a.	704.57	625.97	613.30	596.50	594.29	589.54	590.05	588.03	588.28	586.73	583.11
Variable expenses/a.	241.39	242.91	228.95	221.54	221.90	226.46	230.03	232.36	234.46	237.35	240.74
Market net return/a.	463.18	383.06	384.36	374.96	372.39	363.07	360.02	355.67	353.82	349.38	342.37
Marketing loan benefits/a.*	0.00	0.00	0.06	0.26	0.09	0.05	0.14	0.10	0.29	0.69	0.56
Payments to participants											
PLC/base a.*	0.00	0.49	3.16	7.44	9.24	9.60	8.43	9.52	9.16	10.22	10.47
ARC/base a.*	0.37	1.08	5.81	13.07	18.76	21.42	17.68	13.88	12.77	12.62	13.17
Insurance net indemnities/a.*	11.33	22.75	19.84	19.90	19.03	19.00	19.11	19.07	18.79	19.17	19.16
					(Dollars per bushel)						
Crush margin	3.38	3.08	2.95	2.94	2.96	2.99	3.01	3.04	3.08	3.11	3.14

* Marketing loan benefits and insurance net indemnities are averaged across all acres. ARC and PLC payments are per participating acre.
All projections are averages across 500 stochastic outcomes.

Soybean oil supply and use

October-September year	22/23	23/24	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33
					(Million pounds)						
Supply	28,694	30,104	30,840	31,231	31,680	32,124	32,556	32,926	33,330	33,712	34,120
Beginning stocks	1,991	1,898	1,926	1,885	1,913	1,967	2,037	2,073	2,102	2,123	2,145
Production	26,327	27,339	28,063	28,579	28,972	29,372	29,757	30,132	30,517	30,879	31,230
Imports	376	867	851	768	796	785	763	720	712	711	745
Domestic use	26,015	27,474	28,137	28,402	28,826	29,190	29,546	29,875	30,223	30,590	31,012
Biofuel	11,657	13,047	13,675	13,913	14,274	14,565	14,849	15,111	15,382	15,677	16,027
Food and other	14,357	14,427	14,462	14,489	14,551	14,626	14,697	14,764	14,841	14,912	14,985
Exports	781	704	817	916	888	897	937	949	985	977	943
Total use	26,796	28,178	28,955	29,319	29,713	30,088	30,483	30,824	31,207	31,567	31,955
Ending stocks	1,898	1,926	1,885	1,913	1,967	2,037	2,073	2,102	2,123	2,145	2,165
Price					(Cents per pound)						
Decatur	67.38	62.20	62.10	61.43	61.10	60.76	60.69	60.51	60.58	60.65	60.82

All projections are averages across 500 stochastic outcomes.

Soybean meal supply and use

October-September year	22/23	23/24	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33
					(Thousand tons)						
Supply	53,783	55,719	57,191	58,230	59,023	59,831	60,605	61,361	62,134	62,862	63,570
Beginning stocks	311	345	366	371	378	383	387	390	393	396	400
Production	52,872	54,774	56,225	57,258	58,045	58,848	59,618	60,371	61,141	61,866	62,571
Imports	600	600	600	600	600	600	600	600	600	600	600
Domestic use	39,717	40,139	40,340	40,971	41,349	41,829	42,227	42,725	43,249	43,792	44,331
Exports	13,722	15,214	16,480	16,880	17,291	17,615	17,988	18,242	18,489	18,671	18,836
Total use	53,439	55,353	56,820	57,852	58,641	59,444	60,215	60,968	61,738	62,463	63,167
Ending stocks	345	366	371	378	383	387	390	393	396	400	404
Price					(Dollars per ton)						
Decatur, 48% protein	420.86	347.74	328.39	312.83	307.39	302.43	299.79	295.04	291.55	287.51	281.60

All projections are averages across 500 stochastic outcomes.

Canola supply and use

September-August year	22/23	23/24	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33
Area					(Million acres)						
Planted area	2.21	2.11	2.15	2.26	2.30	2.33	2.36	2.39	2.42	2.45	2.48
Harvested area	2.17	2.06	2.10	2.20	2.25	2.28	2.30	2.33	2.37	2.39	2.42
					(Pounds per harvested acre)						
Yield	1,762	1,857	1,872	1,884	1,902	1,924	1,938	1,956	1,974	1,989	2,004
Supply and use					(Million pounds)						
Production	3,822	3,838	3,939	4,161	4,282	4,382	4,467	4,571	4,680	4,772	4,856
Imports	1,053	1,277	1,344	1,341	1,367	1,389	1,408	1,417	1,426	1,443	1,461
Domestic use	4,426	4,735	4,929	5,123	5,271	5,393	5,496	5,604	5,716	5,822	5,921
Exports	302	345	351	360	364	364	369	372	379	382	385
Ending stocks	428	212	199	243	261	257	255	255	256	254	244
Prices, returns and payments					(Dollars)						
Farm price/lb	0.310	0.235	0.238	0.232	0.230	0.227	0.227	0.225	0.225	0.223	0.221
Market net return/a.	241.94	124.04	153.07	151.05	153.24	146.25	144.62	141.51	141.17	138.18	134.84
Marketing loan benefits/a.*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Payments to participants											
PLC/base a.*	0.00	1.06	1.32	4.17	9.86	13.03	6.51	4.18	4.60	4.87	4.81
ARC/base a.*	0.00	1.84	5.56	8.12	11.43	11.75	8.96	8.60	8.03	7.71	7.83

* Marketing loan benefits are averaged across all acres. ARC and PLC payments are per participating acre.

All projections are averages across 500 stochastic outcomes.

Sunflower seed supply and use

September-August year	22/23	23/24	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33
Area					(Million acres)						
Planted area	1.69	1.79	1.70	1.79	1.76	1.73	1.72	1.72	1.73	1.74	1.74
Harvested area	1.61	1.71	1.63	1.72	1.68	1.65	1.64	1.65	1.66	1.66	1.66
					(Pounds per harvested acre)						
Yield	1,750	1,682	1,696	1,709	1,722	1,736	1,748	1,761	1,773	1,783	1,793
Supply and use					(Million pounds)						
Production	2,813	2,884	2,766	2,936	2,894	2,871	2,869	2,905	2,943	2,959	2,983
Imports	271	310	354	353	366	377	374	365	359	358	357
Domestic use	2,787	3,007	3,017	3,133	3,137	3,129	3,124	3,141	3,169	3,187	3,209
Exports	149	136	122	122	118	115	117	121	124	123	124
Ending stocks	443	494	475	509	515	518	521	529	537	545	552
Prices, returns and payments					(Dollars)						
Farm price/lb	0.306	0.261	0.269	0.252	0.245	0.239	0.238	0.237	0.236	0.235	0.234
Market net return/a.	333.47	235.00	264.51	245.01	235.72	224.53	222.60	221.81	220.94	219.07	217.62
Marketing loan benefits/a.*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Payments to participants											
PLC/base a.*	0.00	0.00	0.00	0.10	1.25	2.77	1.42	0.67	0.45	0.34	0.20
ARC/base a.*	0.00	0.02	0.25	3.13	11.26	11.94	7.76	5.13	4.15	3.27	2.91

* Marketing loan benefits are averaged across all acres. ARC and PLC payments are per participating acre.
All projections are averages across 500 stochastic outcomes.

Cottonseed production and prices

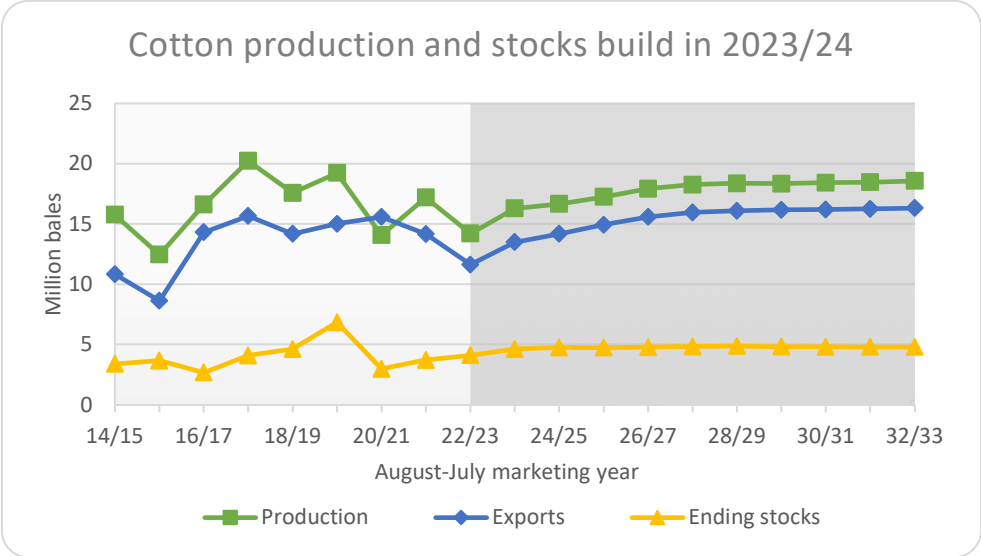
Marketing year	22/23	23/24	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33
					(Thousand tons, August-July year)						
Production	4,455	5,221	5,352	5,543	5,752	5,861	5,898	5,885	5,901	5,905	5,932
					(Dollars per ton, August-July year)						
Price	331	257	235	226	219	215	212	210	208	205	202

All projections are averages across 500 stochastic outcomes.

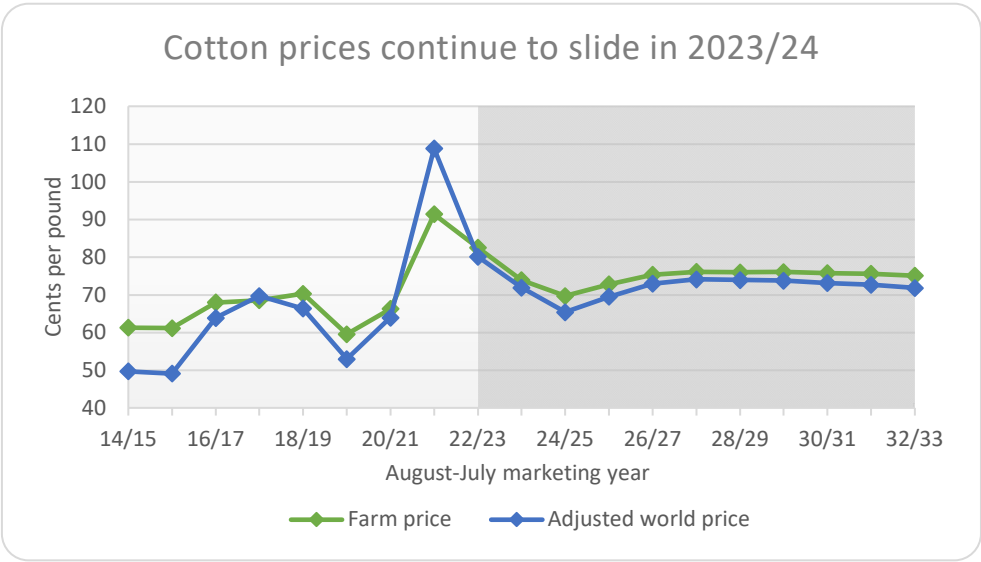
Other crops

Upland cotton and seed cotton

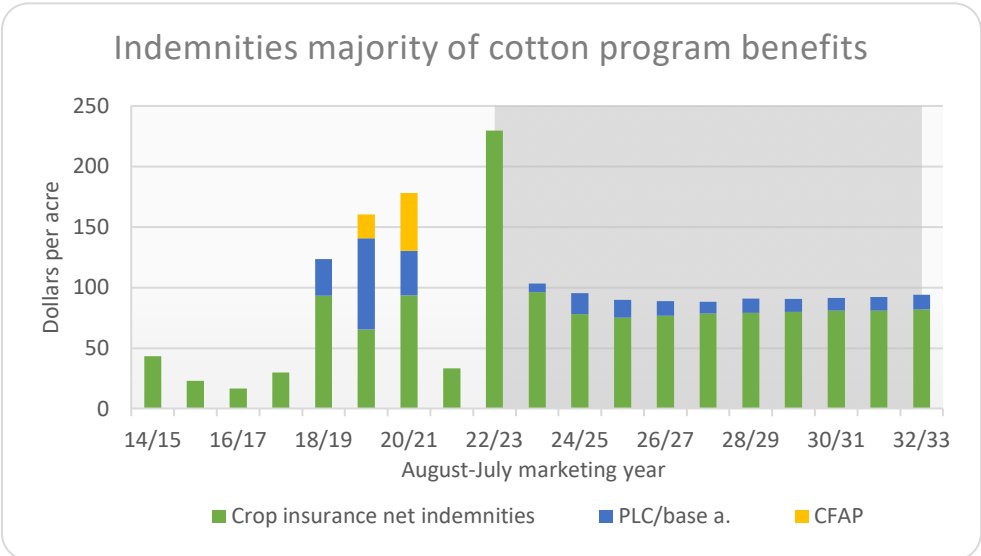
The extreme drought in 2022 impacted cotton production by increasing abandonment of planted acres (the highest in at least 70 years). Despite a decline in harvested area and production, ending stocks rose as less production met reduced exports and domestic mill use. A return of abandonment closer to historical averages improves production in 2023/24. Cotton production increases modestly throughout the baseline.

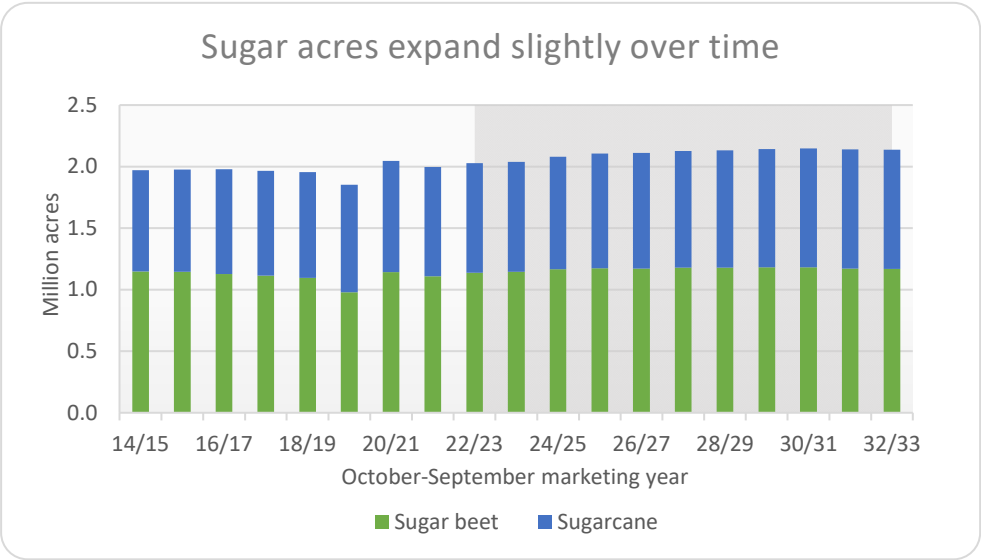


Upland cotton prices rose dramatically in 2021/22 with adjusted world prices hitting their highest point in 11 years. Despite weaker U.S. production in 2022/23, U.S. farm prices fell as total use declined. For 2023/24, farm prices continue to slide as increasing domestic mill use and exports are not enough to compensate for better U.S. production.



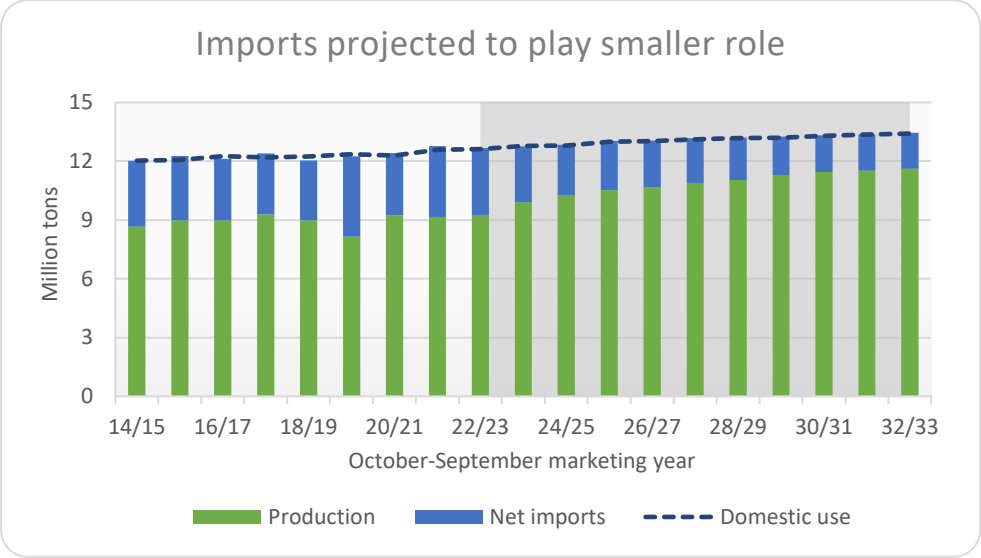
The widespread extreme drought in 2022 resulted in record large crop insurance benefits for 2022/23, although the higher seed cotton prices drove PLC payments to zero. For 2023/24 and later, crop insurance net indemnities average $80/acre. PLC payments average just $12/acre as projected average seed cotton prices are above the effective reference price in most years.



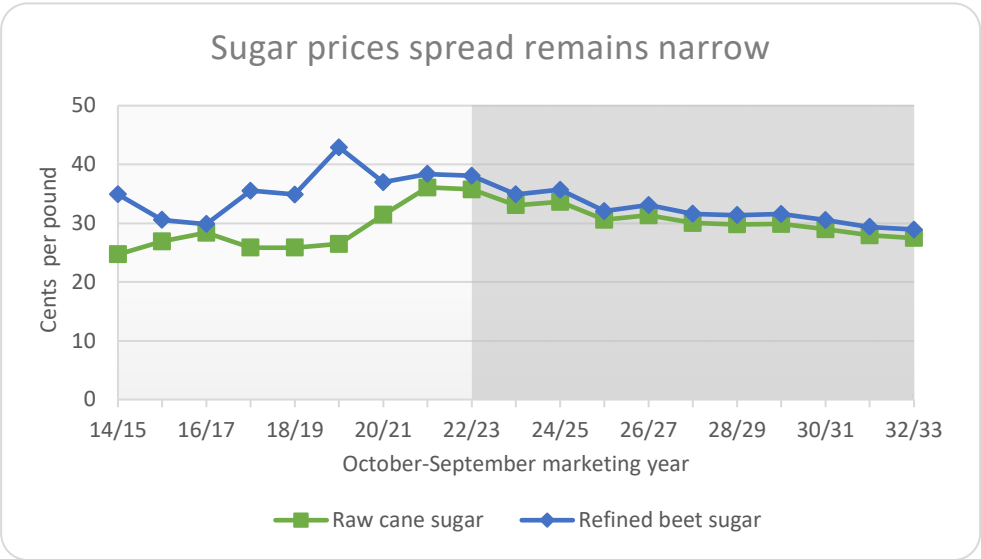


Sugar

Areas harvested for sugarcane and sugar beets averaged 0.86 and 1.12 million acres, respectively, for the 10-year historical period from 2012/13 to 2021/22. Both crops are projected to increase areas harvested over the projection period with sugar beet acres topping out at just over 1.18 million acres in 2029/30 and sugarcane acres peaking at 0.99 million acres in 2032/33.



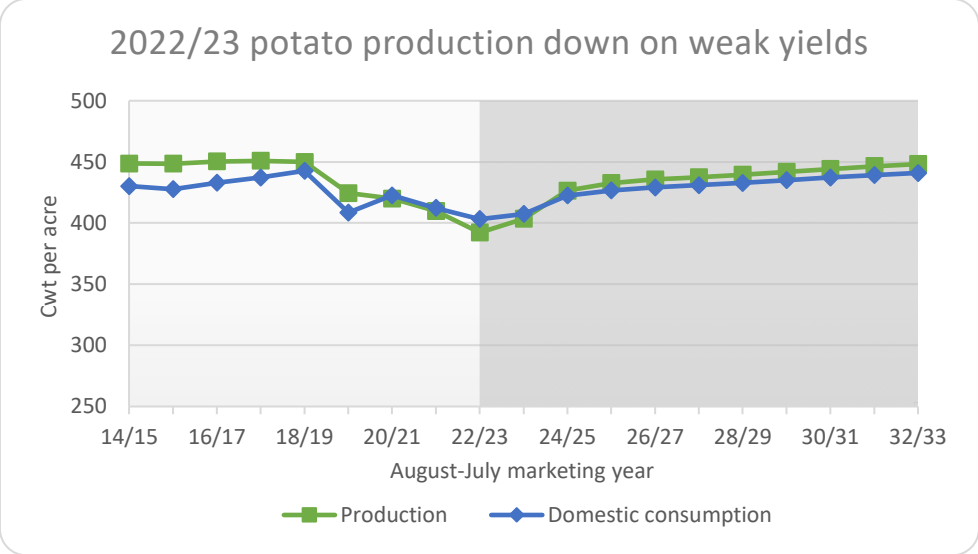
Projected domestic sugar use reaches 13.4 million tons by 2032/33 up from 12.6 million tons in 2022/23. This growth in demand is met primarily with additional domestic sugar production. As a result, the need for imported sugar beyond tariff rate quotas is projected to decline. Projected total imports fall from 3.5 million tons in 2022/23 to 1.9 million tons in 2032/33. The share of demand met with domestic supplies rises to just over 86% compared to the 10-year historical average of 73%.



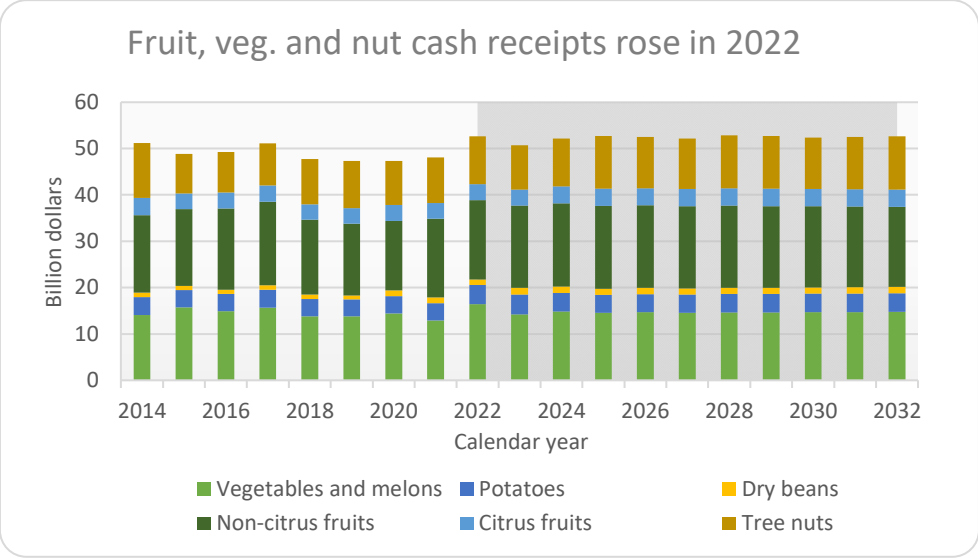
The projected price spread between raw sugar and refined sugar remains quite narrow compared to recent years, though not at unheard-of levels. The projected prices also decline somewhat over time, with raw prices ending at 27.4 cents/lb and refined prices at 28.9 cents/lb. These prices remain above the levels that would normally result in sugar program outlays.

Potatoes, fresh vegetables, fruits and nuts

Another year of drought in key potato growing states in 2022 limited yield potential and reduced potato production again in 2022/23. Projected receipts in 2023/24 rebound as trend yields combine with more area to increase production. This assumes that the recent shift of the El Niño Southern Oscillation Index (ENSO) to neutral conditions this spring will lead to improved precipitation in key potato-producing states in 2023.

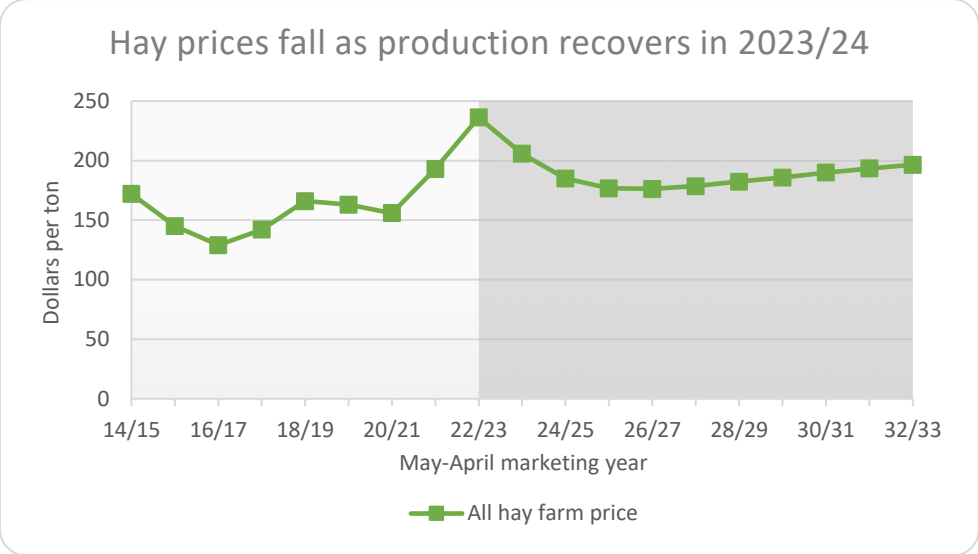


Total cash receipts for fruits, vegetables and tree nuts increased by 9% in 2022 compared to 2021. The drought across much of the Plains and Western United States limited production for multiple crops. Prices consequently rose in select categories on weaker domestic production. Projected receipts decrease 4% in 2023. Yield and production improve for multiple specialty crops as drought recedes in the West, which helps to reduce prices.



Hay

Hay prices peak in 2022/23 because of drought-reduced production. The assumed return to trend yields and a recovery in area in 2023/24 contribute to a projected price decline. An increase in cattle numbers contributes to an increase in prices after 2025/26. The all hay price is made up of alfalfa prices and other hay prices, which are higher and lower than the all hay price, respectively.



Upland cotton supply and use

August-July year	22/23	23/24	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33
Area					(Million acres)						
Planted area	13.58	10.52	11.04	11.31	11.59	11.71	11.73	11.74	11.74	11.71	11.68
Harvested area	7.26	9.14	9.31	9.51	9.75	9.85	9.82	9.70	9.65	9.60	9.59
					(Pounds per harvested acre)						
Yield	939	853	858	870	880	888	897	906	915	922	927
					(Million bales)						
Supply	17.93	20.40	21.28	22.00	22.65	23.03	23.19	23.20	23.23	23.26	23.34
Beginning stocks	3.73	4.11	4.62	4.76	4.74	4.78	4.83	4.87	4.82	4.81	4.79
Production	14.21	16.28	16.66	17.24	17.91	18.25	18.36	18.33	18.41	18.45	18.55
Imports	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Use	13.82	15.77	16.52	17.26	17.87	18.21	18.32	18.38	18.42	18.47	18.56
Domestic mill use	2.20	2.29	2.35	2.34	2.30	2.25	2.23	2.22	2.22	2.23	2.24
Exports	11.62	13.49	14.17	14.92	15.58	15.96	16.09	16.16	16.20	16.25	16.32
Ending stocks	4.11	4.62	4.76	4.74	4.78	4.83	4.87	4.82	4.81	4.79	4.79
Prices, program provisions					(Cents per pound)						
Farm price	82.53	73.93	69.73	72.82	75.33	76.09	76.00	76.09	75.76	75.60	75.11
Adjusted world price	80.11	71.92	65.41	69.53	73.00	74.11	73.97	73.78	73.14	72.67	71.85
Loan rate	52.00	52.00	52.00	52.00	51.98	51.96	51.99	51.99	52.00	51.98	51.99
Returns and payments					(Dollars per ton)						
Gross market revenue/a.	978.03	774.78	731.02	762.32	789.24	800.35	806.12	813.65	816.80	820.19	818.44
Variable expenses/a.	549.61	566.37	540.78	525.40	532.34	546.55	555.64	560.41	564.26	570.07	577.50
Market net return/a.	428.41	208.42	190.24	236.92	256.90	253.79	250.48	253.23	252.54	250.12	240.95
Marketing loan benefits/a.*	0.00	3.99	8.62	5.68	3.96	2.92	4.11	2.23	3.78	3.78	2.73
Insurance net indemnities/a.	229.71	96.23	78.06	75.28	76.80	78.70	79.15	79.83	80.83	80.94	82.01

* Marketing loan benefits and insurance net indemnities are averaged across all acres. ARC and PLC payments are per participating acre.
All projections are averages across 500 stochastic outcomes.

Seed cotton indicators

October-September year	22/23	23/24	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33
					(Cents per pound)						
Marketing year average price	45.16	38.96	36.50	37.55	38.44	38.64	38.53	38.51	38.32	38.22	37.94
Effective reference price	36.70	36.70	36.70	36.82	36.92	36.76	36.72	36.72	36.74	36.74	36.74
					(Million acres)						
Base area	12.18	12.14	12.13	12.12	12.11	12.11	12.11	12.11	12.12	12.12	12.12
					(Pounds per acre)						
PLC program yield	997	804	1,060	1,069	983	860	942	920	921	916	944
					(Percent of base acres)						
PLC participation rate	60.9	54.8	71.5	72.0	66.4	56.1	61.9	60.0	60.1	59.2	61.2
ARC participation rate	39.1	45.2	28.5	28.0	33.6	43.9	38.1	40.0	39.9	40.8	38.8
Payments to participants					(Dollars)						
PLC/base a.*	0.00	7.01	17.37	14.72	12.00	9.54	11.71	10.95	10.73	11.46	12.23
ARC/base a.*	14.75	2.63	6.20	8.43	8.51	13.28	9.85	9.84	10.37	11.47	11.46

All projections are averages across 500 stochastic outcomes.

Sugar supply and use

October-September year	22/23	23/24	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33
Area					(Million acres)						
Sugar cane harvested	0.889	0.894	0.915	0.930	0.939	0.947	0.953	0.960	0.966	0.967	0.968
Sugar beet planted	1.160	1.173	1.194	1.203	1.201	1.208	1.207	1.210	1.210	1.201	1.198
Sugar beet harvested	1.137	1.145	1.166	1.174	1.172	1.178	1.178	1.181	1.181	1.172	1.169
Yield					(Tons per harvested acre)						
Cane sugar	4.73	4.83	4.88	4.93	4.97	5.01	5.05	5.11	5.16	5.18	5.21
Beet sugar	4.44	4.87	4.96	5.05	5.13	5.21	5.29	5.38	5.47	5.55	5.62
Supply and use					(Thousand tons)						
Production	9,251	9,896	10,251	10,518	10,672	10,886	11,049	11,263	11,443	11,511	11,615
Cane sugar	4,204	4,319	4,467	4,591	4,664	4,744	4,818	4,906	4,987	5,010	5,041
Beet sugar	5,046	5,577	5,784	5,927	6,008	6,142	6,231	6,357	6,456	6,501	6,574
Imports	3,461	2,883	2,611	2,551	2,403	2,319	2,204	2,027	1,924	1,900	1,881
Domestic deliveries	12,608	12,770	12,795	12,984	13,011	13,123	13,179	13,199	13,288	13,359	13,435
Exports	37	37	37	42	40	41	42	43	44	46	47
Ending stocks	1,885	1,856	1,886	1,929	1,953	1,994	2,026	2,074	2,109	2,115	2,130
Prices					(Cents per pound)						
N.Y. spot raw sugar	35.73	33.07	33.63	30.59	31.35	30.06	29.79	29.88	28.96	27.93	27.47
Refined beet sugar	38.07	34.90	35.69	32.06	33.09	31.60	31.36	31.57	30.54	29.38	28.90

All projections are averages across 500 stochastic outcomes.

Potato supply and use

August-July year	22/23	23/24	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33
Area					(Thousand acres)						
Planted area	901	912	931	939	939	936	935	934	933	932	929
Harvested area	896	908	925	932	932	930	928	928	927	926	924
					(Hundredweight per harvested acre)						
Yield	438	445	461	464	467	470	473	476	479	482	485
Supply and use					(Million hundredweight)						
Production	392	403	427	433	436	437	439	442	444	446	448
Imports	68	69	69	70	71	71	72	73	73	74	74
Domestic disappearance	403	407	422	427	429	431	433	435	437	439	441
Exports	74	75	77	79	80	82	83	84	85	87	87
Prices					(Dollars per hundredweight)						
Farm price	12.24	11.56	10.01	9.81	9.82	9.89	9.92	9.91	9.88	9.88	9.89
					(Percent of acres)						
Crop insurance participation	83	83	83	83	83	83	83	83	83	83	83
					(Million dollars)						
Cash receipts	4,115	4,295	4,011	3,874	3,888	3,927	3,961	3,984	3,998	4,013	4,034
Returns and payments					(Dollars)						
Gross market revenue/a.	5,362	5,142	4,618	4,556	4,592	4,651	4,696	4,722	4,738	4,765	4,803
Variable expenses/a.	3,354	3,259	2,921	2,677	2,697	2,809	2,856	2,884	2,905	2,942	2,994
Market net return/a.	2,008	1,883	1,697	1,879	1,895	1,842	1,839	1,837	1,833	1,823	1,809
Premium subsidy/a.	64	84	77	63	64	66	67	68	69	69	70

All projections are averages across 500 stochastic outcomes.

Vegetable and melon supply and use

Calendar year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Harvested area					(Million acres)						
Vegetable area	3.80	3.83	3.81	3.81	3.80	3.80	3.80	3.79	3.79	3.79	3.79
Melon area	0.14	0.14	0.14	0.14	0.14	0.14	0.13	0.13	0.13	0.13	0.13
Yield					(Tons per harvested acre)						
Vegetable yield	8.7	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8
Melon yield	16.6	16.9	17.1	17.3	17.5	17.7	17.9	18.0	18.2	18.4	18.6
Vegetable supply and use					(Million tons)						
Production	33.2	33.5	33.4	33.4	33.3	33.3	33.2	33.2	33.2	33.2	33.2
Imports	11.1	11.2	11.4	11.6	11.8	12.0	12.3	12.5	12.7	12.9	13.1
Domestic use	41.2	41.5	41.6	41.8	41.9	42.1	42.2	42.4	42.6	42.8	43.0
Exports	3.1	3.2	3.2	3.3	3.2	3.3	3.3	3.3	3.3	3.3	3.3
Melon supply and use											
Production	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4	2.4
Imports	1.5	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.5	1.5
Domestic use	3.5	3.5	3.5	3.5	3.5	3.5	3.6	3.6	3.6	3.6	3.6
Exports	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Prices					(Cents per pound)						
Vegetable price	18.89	20.19	19.72	20.66	20.20	20.46	20.25	20.43	20.38	20.47	20.49
Dry bean price	47.29	42.36	39.23	38.32	37.94	37.69	37.46	37.25	37.15	37.08	36.98
Melons price	19.07	18.85	19.76	19.34	19.79	19.70	20.02	20.07	20.31	20.42	20.66
Cash receipts					(Million dollars)						
Vegetable*	15,585	13,341	13,919	13,635	13,772	13,630	13,725	13,688	13,735	13,746	13,790
Dry bean	1,177	1,421	1,346	1,314	1,315	1,323	1,332	1,341	1,351	1,362	1,373
Melon	885	889	933	920	942	940	955	957	969	974	985
Total receipts	17,647	15,651	16,199	15,869	16,029	15,892	16,011	15,986	16,054	16,082	16,148

Note: Vegetable category excludes dry beans, melons and potatoes.

Fruit and tree nut supply and use

Calendar year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Bearing area					(Million acres)						
Non-citrus fruit	1.83	1.86	1.87	1.88	1.88	1.88	1.87	1.86	1.86	1.85	1.84
Citrus fruit	0.64	0.61	0.63	0.62	0.63	0.63	0.60	0.60	0.58	0.58	0.57
Tree nut	2.59	2.60	2.63	2.58	2.64	2.71	2.69	2.72	2.78	2.80	2.81
Yield					(Tons per bearing acre)						
Non-citrus fruit	8.38	8.96	8.99	9.02	9.05	9.08	9.11	9.14	9.17	9.20	9.23
Citrus fruit	8.83	8.00	10.42	9.96	10.43	10.32	10.44	10.44	10.50	10.52	10.56
Tree nut	0.75	0.82	0.83	0.83	0.83	0.83	0.84	0.84	0.84	0.85	0.85
Non-citrus fruit supply and use					(Million tons)						
Production	15.3	16.6	16.8	17.0	17.1	17.1	17.0	17.0	17.0	17.0	17.0
Imports	11.2	11.3	11.3	11.3	11.3	11.4	11.4	11.5	11.5	11.6	11.6
Domestic use	24.8	26.0	26.1	26.3	26.4	26.4	26.5	26.5	26.6	26.7	26.7
Exports	1.8	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0	1.9	1.9
Citrus fruit supply and use											
Production	5.6	4.9	6.5	6.2	6.6	6.5	6.3	6.2	6.1	6.1	6.0
Imports	1.8	1.8	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.8
Domestic use	6.8	6.2	7.7	7.4	7.7	7.6	7.4	7.4	7.3	7.3	7.3
Exports	0.6	0.5	0.5	0.5	0.6	0.6	0.5	0.5	0.5	0.5	0.5
Tree nut supply and use											
Production	1.9	2.1	2.2	2.1	2.2	2.3	2.3	2.3	2.3	2.4	2.4
Imports	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Domestic use	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	1.0	1.0	1.0
Exports	1.4	1.6	1.6	1.6	1.7	1.7	1.7	1.8	1.8	1.8	1.8
Prices					(Cents per pound)						
Non-citrus fruit	56.03	53.36	53.54	52.88	52.38	52.21	52.03	51.80	51.52	51.18	50.82
Citrus fruit	30.57	35.64	27.87	29.85	28.07	28.69	29.93	29.95	30.52	30.73	30.91
Tree nut	263.86	220.29	236.44	262.23	250.51	237.17	251.25	246.47	233.99	236.61	239.22
Cash receipts					(Million dollars)						
Non-citrus fruit	17,122	17,714	17,952	17,905	17,828	17,761	17,689	17,601	17,496	17,376	17,248
Citrus fruit	3,430	3,485	3,635	3,708	3,688	3,717	3,744	3,738	3,740	3,732	3,724
Tree nut	10,293	9,530	10,369	11,296	11,065	10,802	11,397	11,348	11,054	11,281	11,484
Total receipts	30,844	30,729	31,956	32,908	32,580	32,279	32,830	32,688	32,290	32,389	32,456

Hay supply and use

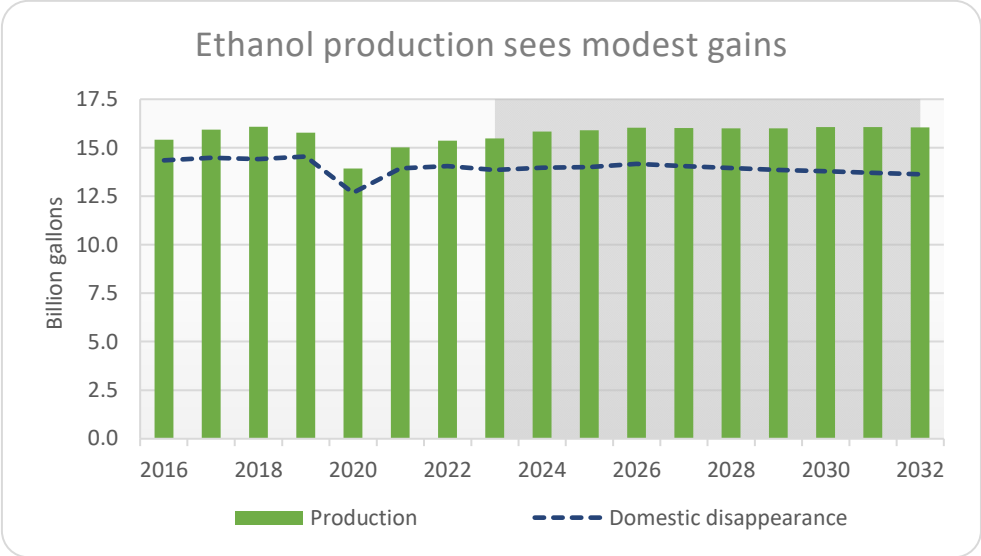
May-April year	22/23	23/24	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33
					(Million acres)						
Harvested area	49.5	50.2	50.1	49.7	49.5	49.6	49.9	50.3	50.6	51.0	51.3
					(Tons per acre)						
Yield	2.28	2.41	2.43	2.44	2.45	2.46	2.47	2.47	2.48	2.49	2.49
Supply and use					(Million tons)						
Production	112.8	121.0	121.6	121.2	121.4	122.1	123.1	124.2	125.5	126.8	127.8
Domestic disappearance	112.9	113.6	113.5	114.1	115.0	116.2	117.4	118.5	119.7	120.9	122.0
Net exports	4.8	5.1	5.4	5.6	5.7	5.7	5.7	5.6	5.6	5.6	5.6
Ending stocks	11.9	14.2	16.9	18.5	19.2	19.5	19.6	19.7	19.9	20.1	20.3
					(Dollars per ton)						
All hay farm price	236.30	205.75	185.02	176.74	176.18	178.58	182.35	185.83	189.95	193.42	196.58

All projections are averages across 500 stochastic outcomes.

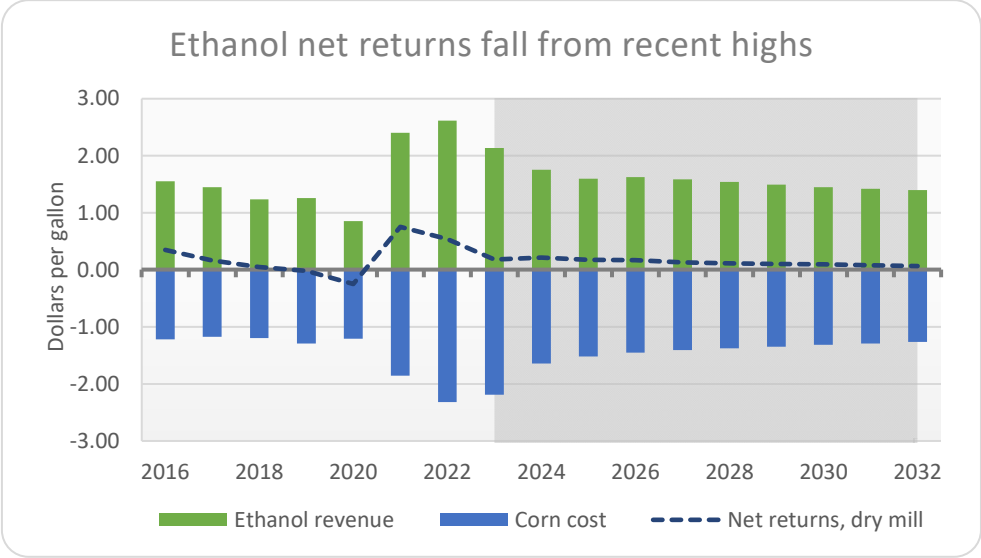
Biofuels

Ethanol

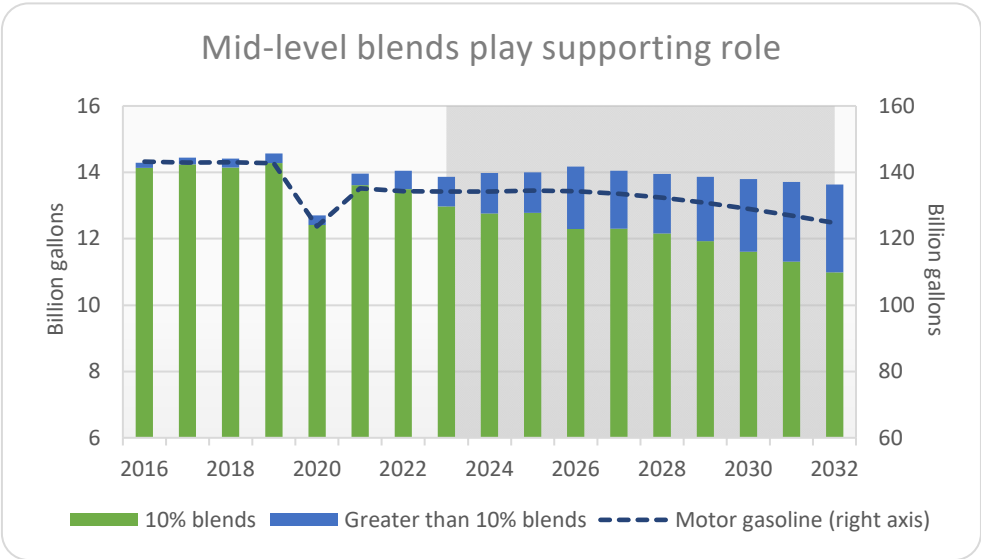
U.S. ethanol production is projected to rise from a little over 15.3 billion gallons in 2022 to just over 16 billion gallons by 2032. Nearly all domestic production comes from corn starch, with only minor quantities of cellulosic based fuel. Domestic use remains nearly flat in the projections.

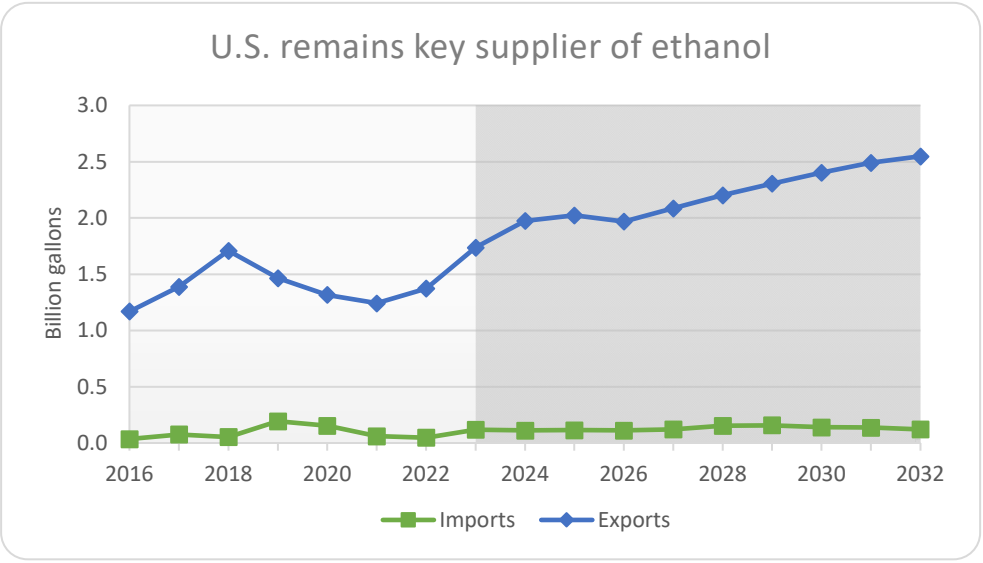


Dry-mill ethanol net returns maintained some of the strength of 2021 into 2022. Going forward, projected net returns fall to a lower but still sustainable level as both corn input costs and revenues from ethanol fall similarly.

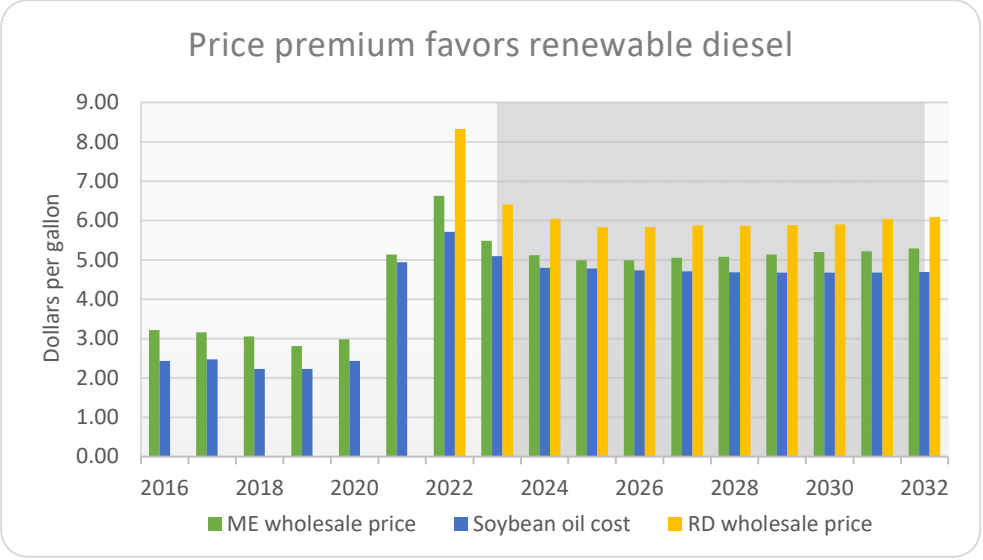


Motor gasoline use declines over the projection period due to improvements in vehicle fuel efficiency, among other factors. Projected ethanol use peaks at around 14.1 billon gallons in 2026 before trending down. The relative decline in ethanol use is less than the reduction in gasoline use as the mid-level blends (e.g., E15) expand their share in the fuel pool. Keep in mind that the projected pace of E15 adoption is based on price signals alone and does not include new rules or legislation related to the Reid vapor pressure waiver for E15.



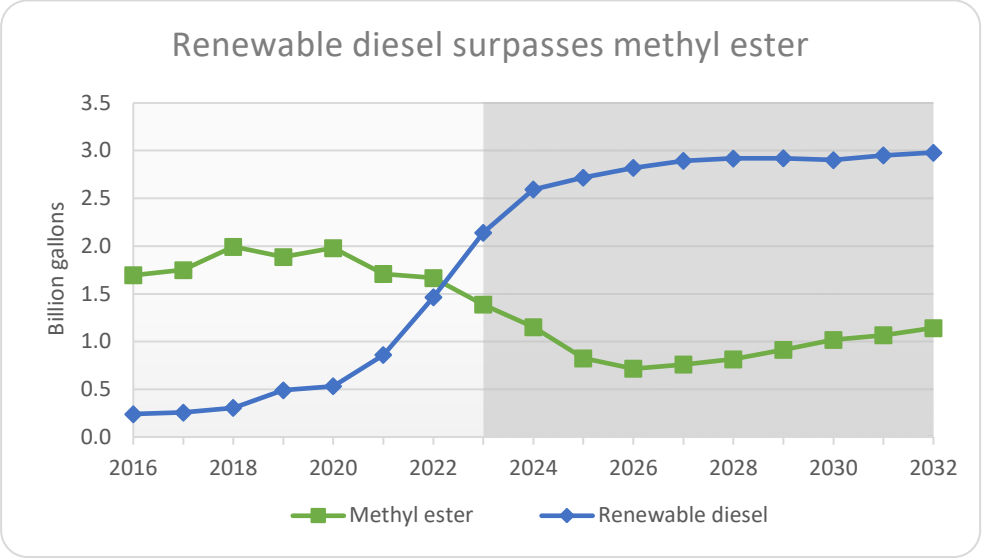


As petroleum prices and global incomes rise, projected international ethanol demand increases and pushes U.S. ethanol exports to near 2.5 billion gallons by 2032. U.S. imports of ethanol remain limited to small quantities brought in to help meet state-level Low Carbon Fuel Standard (LCFS) requirements.



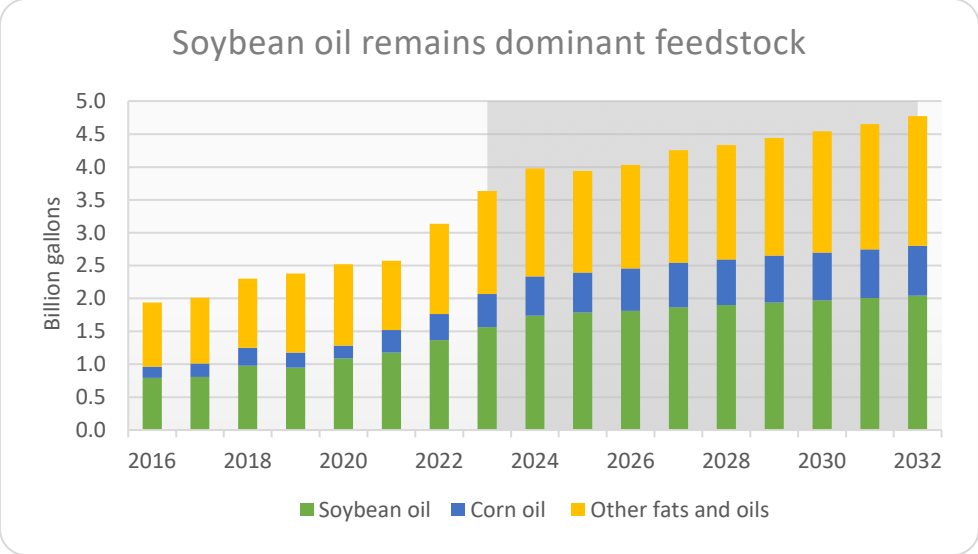
Biomass-based diesel

High Renewable Identification Number (RIN) prices and production incentives in the Inflation Reduction Act give renewable diesel (RD) a distinct advantage over methyl ester (ME) biodiesel despite reduced LCFS credit prices. The spread between projected soybean oil prices (per gallon of renewable fuel produced) and ME prices averages $0.21/gallon, while the spread between projected soybean oil prices and RD prices averages $1.22/gallon.



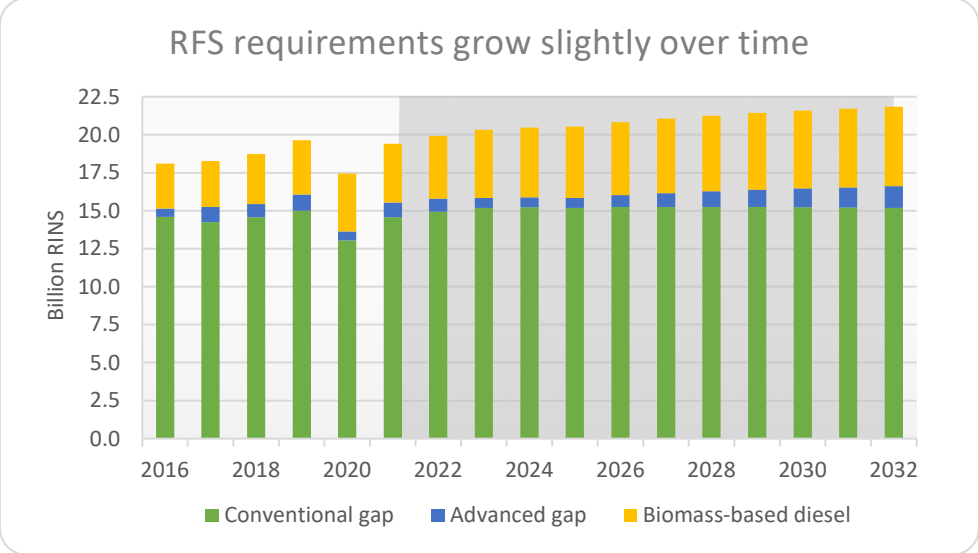
Projected domestic RD production increases rapidly in the near term and maintains modest growth beyond 2025. As ME biodiesel struggles to compete with renewable diesel, there is an initial downward trend to ME production before demand and policy incentives encourage a return to growth. Overall biomass-based diesel production is projected to rise from 3.1 billion gallons in 2022 to 4.1 billion gallons in 2032.

Projected use of soybean oil as a renewable fuel feedstock rises from 11.6 billion pounds in the 2022/23 marketing year to just over 16 billion pounds by the end of the period. This equates to around 2 billion gallons of biomass-based diesel. Distillers corn oil makes up an increasing share of feedstock use, reaching 16%, while the share of other fats and oils falls slightly from 43% in 2023 down to 41% by 2032.

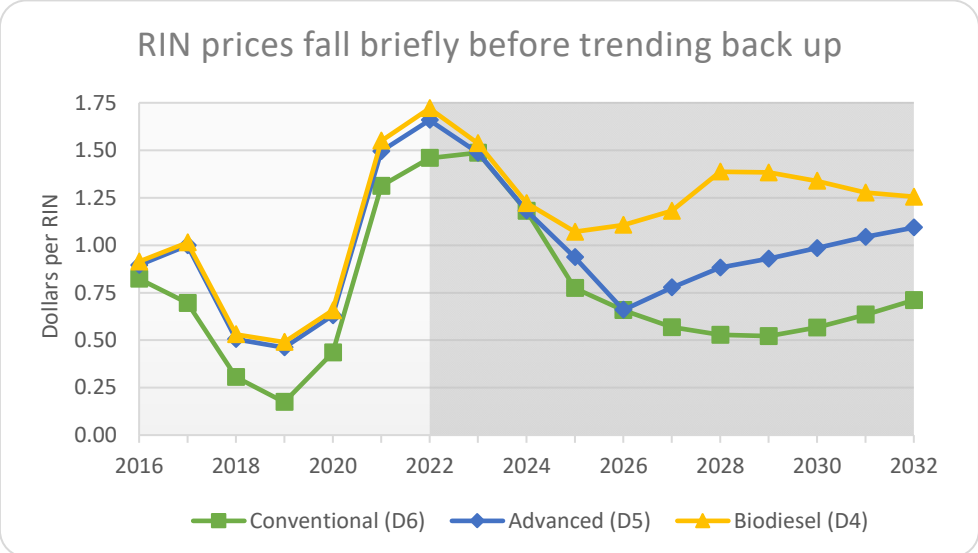


Renewable fuel standard

EPA's proposed RFS requirements for 2023-25 are included in this outlook, and we assume a modest growth in requirements beyond 2025. As part of those requirements, the conventional gap was expanded to 15.25 billion gallons, and we keep it at that level for the projection period.



The prices for all RIN categories continued their upward trajectory in 2022 and reached a record high annual average. So far in 2023, these prices remain elevated averaging over $1.60/RIN for all types. Going forward, projected D6 (ethanol) RIN prices decline to around $0.50/RIN in 2029. D5 (advanced biofuel) RINs decline similarly until 2026 before rising again the following year while D4 (biodiesel) RINs begin rising again in 2026 after a couple years of decline.



Ethanol supply and use

Calendar year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Petroleum fuel prices					(Dollars per barrel)						
Petroleum, West Texas Interm.	94.72	85.16	82.29	83.57	84.20	86.43	87.90	89.58	91.29	92.99	94.76
Petroleum, refiners' acquisition	95.07	86.32	83.38	85.12	86.24	88.65	89.99	91.58	93.40	95.25	97.13
					(Dollars per gallon)						
Unleaded gasoline, FOB Omaha	3.17	2.88	2.63	2.65	2.65	2.73	2.78	2.83	2.89	2.96	3.02
Unleaded gasoline, retail	4.09	3.58	3.30	3.30	3.30	3.37	3.42	3.48	3.55	3.63	3.71
					(Million gallons)						
Motor gasoline use*	134,297	134,206	134,227	134,455	134,309	133,529	132,336	130,789	128,991	126,985	124,809
Ethanol supply and use											
Production	15,357	15,481	15,843	15,908	16,033	16,016	16,002	16,010	16,063	16,071	16,060
From corn	15,333	15,458	15,808	15,871	15,972	15,934	15,904	15,902	15,945	15,943	15,922
Other conventional	23	22	33	36	59	80	95	106	115	124	135
Cellulosic	1	1	1	1	1	2	2	2	3	3	3
Imports	48	119	113	115	112	122	155	159	141	138	123
Domestic disappearance	14,050	13,866	13,982	14,000	14,175	14,051	13,955	13,863	13,799	13,716	13,633
Exports	1,375	1,739	1,975	2,024	1,970	2,087	2,203	2,306	2,405	2,492	2,549
Ending stocks	904	899	897	896	895	895	894	894	894	894	894
Ethanol prices					(Dollars per gallon)						
Conventional rack, Omaha	2.61	2.13	1.75	1.60	1.63	1.59	1.54	1.49	1.45	1.42	1.40
Other advanced rack	2.81	2.13	1.75	1.76	1.63	1.80	1.90	1.90	1.87	1.83	1.78
Effective retail	2.08	1.33	1.24	1.47	1.61	1.66	1.65	1.62	1.54	1.46	1.37
Ethanol/gasoline retail	51%	37%	38%	45%	49%	49%	48%	46%	43%	40%	37%
RIN values											
Conventional ethanol	1.46	1.49	1.18	0.77	0.66	0.57	0.53	0.52	0.57	0.63	0.71
Advanced ethanol	1.66	1.49	1.18	0.94	0.66	0.78	0.88	0.93	0.99	1.04	1.09

* Includes fuel ethanol

All projections are averages across 500 stochastic outcomes.

Renewable fuel standard

Calendar year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Applicable standard											
Overall	11.59%	11.92%	12.55%	13.05%	13.55%	14.05%	14.56%	15.06%	15.56%	16.06%	16.56%
Advanced biofuels	3.16%	3.33%	3.80%	4.28%	4.43%	4.58%	4.73%	4.88%	5.03%	5.18%	5.33%
Cellulosic biofuel	0.35%	0.41%	0.82%	1.23%	1.27%	1.30%	1.34%	1.37%	1.41%	1.44%	1.48%
Biomass-based diesel	2.33%	2.54%	2.60%	2.67%	2.74%	2.80%	2.87%	2.93%	3.00%	3.06%	3.13%
Applied standard					(Million gallons)						
Overall	20,532	21,060	21,923	22,722	23,024	23,259	23,474	23,659	23,822	23,964	24,092
Advanced biofuels	5,598	5,883	6,695	7,536	7,786	8,013	8,226	8,419	8,595	8,758	8,906
Cellulosic biofuel	609	730	1,458	2,187	2,198	2,209	2,221	2,232	2,244	2,255	2,267
Biomass-based diesel	4,128	4,488	4,580	4,701	4,807	4,899	4,982	5,055	5,118	5,174	5,222
Gaps: Conventional	14,934	15,177	15,229	15,186	15,238	15,246	15,248	15,240	15,227	15,206	15,185
Advanced	862	666	656	648	781	905	1,023	1,132	1,234	1,329	1,418

All projections are averages across 500 stochastic outcomes.

Biomass-based diesel sector

Calendar year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Biomass-based diesel supply					(Million gallons)						
Production	3,137	3,634	3,980	3,939	4,032	4,257	4,333	4,440	4,540	4,651	4,772
From soybean oil	1,365	1,564	1,738	1,789	1,813	1,867	1,900	1,938	1,971	2,007	2,046
From corn oil	397	505	595	606	644	678	694	712	728	743	755
From other fats and oils	1,376	1,565	1,647	1,544	1,575	1,712	1,739	1,789	1,842	1,902	1,972
From cellulosic diesel	0	0	0	0	0	0	0	0	0	0	0
Renewable diesel	0	0	0	0	0	0	0	0	0	0	0
Net imports	134	220	216	219	199	171	150	138	127	113	105
Biomass-based diesel use											
Domestic disappearance	3,327	3,830	4,182	4,152	4,227	4,424	4,480	4,576	4,666	4,762	4,876
Ending stocks	120	143	157	164	167	171	173	174	175	177	179
Fuel prices and tax credit					(Dollars per gallon)						
Biodiesel, rack	6.62	5.49	5.12	4.99	4.99	5.05	5.08	5.14	5.20	5.22	5.29
#2 diesel, refiner sales	3.58	3.15	2.89	2.67	2.66	2.74	2.79	2.84	2.91	2.97	3.03
#2 diesel, retail	5.00	4.44	3.92	3.68	3.69	3.78	3.86	3.92	3.98	4.05	4.12
Biodiesel tax credit	1.00	1.00	1.00	0.60	0.60	0.60	0.00	0.00	0.00	0.00	0.00
RIN values											
Per RIN gallon	1.72	1.54	1.22	1.07	1.11	1.18	1.39	1.38	1.34	1.28	1.26
Per physical gallon	2.58	2.31	1.83	1.61	1.66	1.77	2.08	2.08	2.01	1.92	1.88

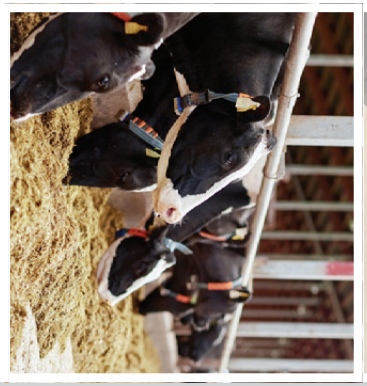
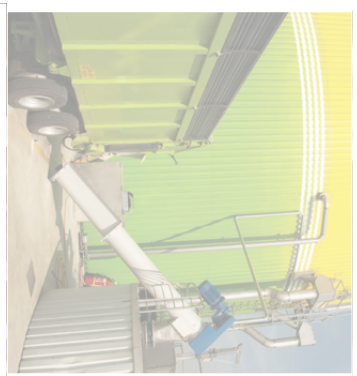
All projections are averages across 500 stochastic outcomes.

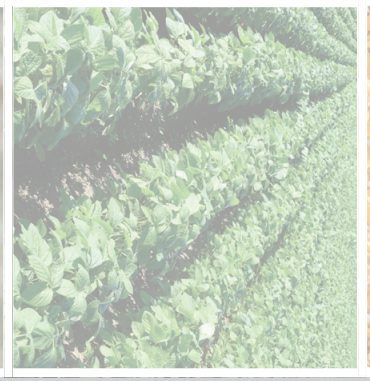
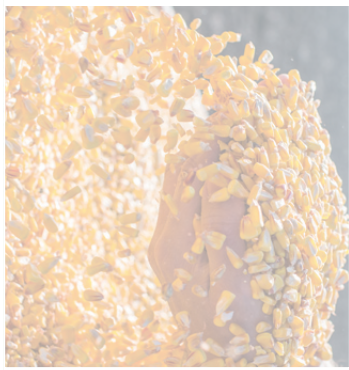
Biofuel plant returns

Calendar year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Biodiesel costs and returns					(Dollars per gallon)						
Biodiesel value	6.62	5.49	5.12	4.99	4.99	5.05	5.08	5.14	5.20	5.22	5.29
Glycerin value	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
Soybean oil cost	-5.72	-5.10	-4.79	-4.78	-4.73	-4.71	-4.69	-4.68	-4.68	-4.68	-4.69
Other operating costs	-0.64	-0.65	-0.65	-0.66	-0.67	-0.68	-0.68	-0.69	-0.70	-0.71	-0.71
Net operating return	0.44	-0.09	-0.16	-0.28	-0.24	-0.16	-0.12	-0.06	-0.01	0.01	0.06
Corn milling for ethanol					(Million gallons)						
Corn wet milled for ethanol	386	481	544	570	587	594	594	592	590	587	585
Corn dry milled for ethanol	4,827	4,805	4,860	4,851	4,865	4,841	4,826	4,822	4,834	4,832	4,822
(Share de-oiling DDGS)	91%	93%	95%	96%	97%	98%	98%	98%	98%	98%	98%
Dry mill ethanol costs, returns					(Dollars per gallon)						
Ethanol value	2.61	2.13	1.75	1.60	1.63	1.59	1.54	1.49	1.45	1.42	1.40
Distillers grains value	0.68	0.66	0.55	0.51	0.49	0.48	0.47	0.47	0.46	0.45	0.45
Corn oil value	0.23	0.21	0.19	0.19	0.17	0.17	0.17	0.17	0.18	0.18	0.18
Corn cost	-2.32	-2.19	-1.64	-1.52	-1.46	-1.41	-1.38	-1.35	-1.31	-1.29	-1.26
Fuel and electricity cost	-0.26	-0.22	-0.21	-0.18	-0.23	-0.25	-0.25	-0.23	-0.22	-0.22	-0.23
Other operating costs	-0.41	-0.42	-0.43	-0.43	-0.43	-0.44	-0.44	-0.45	-0.45	-0.46	-0.46
Net operating return	0.54	0.18	0.21	0.17	0.17	0.13	0.12	0.10	0.10	0.08	0.06

* Weighted by share of dry mills de-oiling DDGS

All projections are averages across 500 stochastic outcomes.

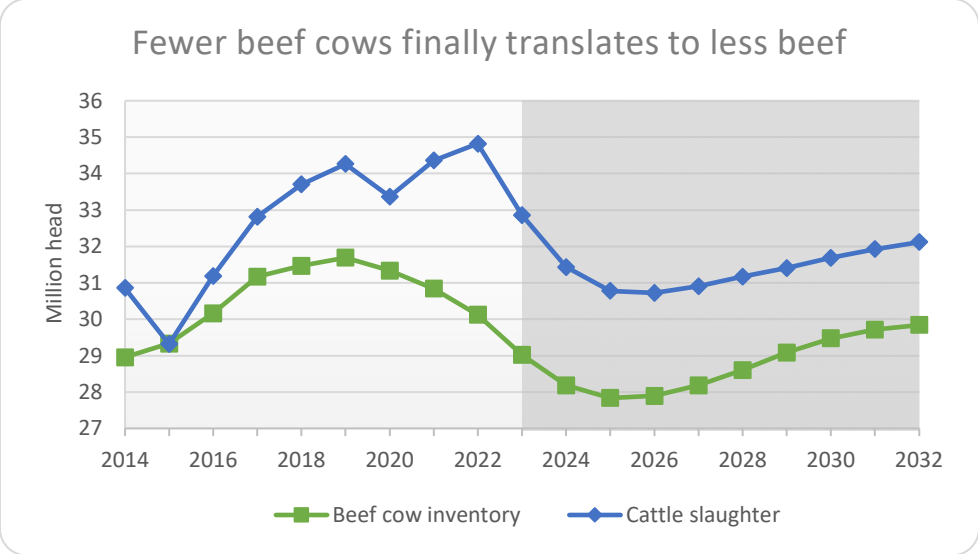




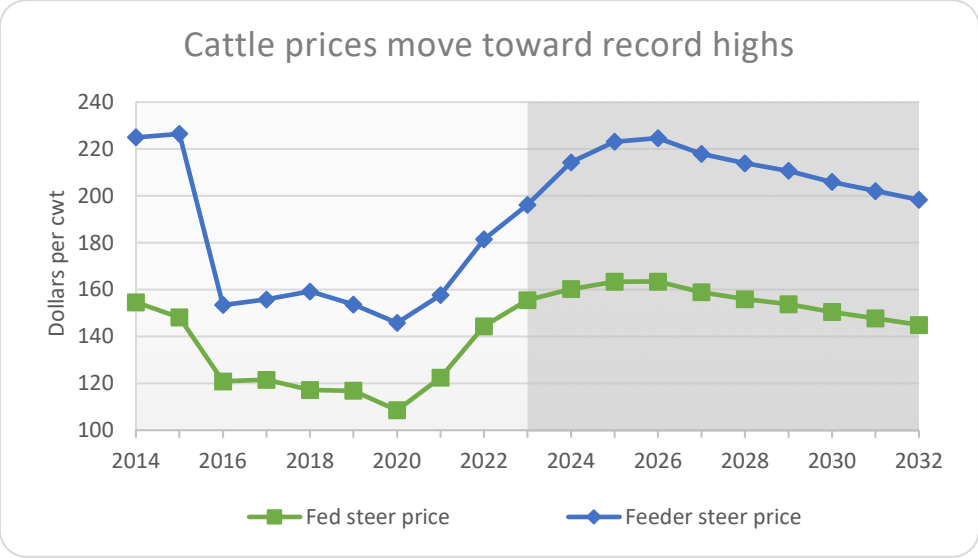
Livestock & dairy

Cattle and hogs

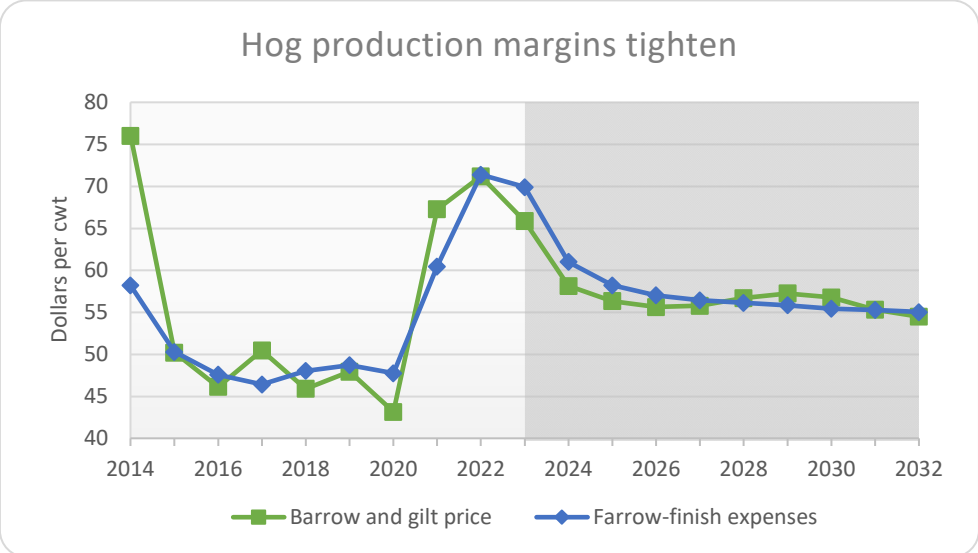
The beef cow herd continues to decline due to drought conditions in a large portion of important cow-calf production areas. Profitability levels are not yet strong enough to promote significant expansion in areas with sufficient forage and hay supplies. Large numbers of beef cows and heifers sent to slaughter have bolstered beef production since 2021 but cannot continue to make up for dwindling calf numbers. The extent to which drought continues this year will affect cow herd rebuilding and beef production.

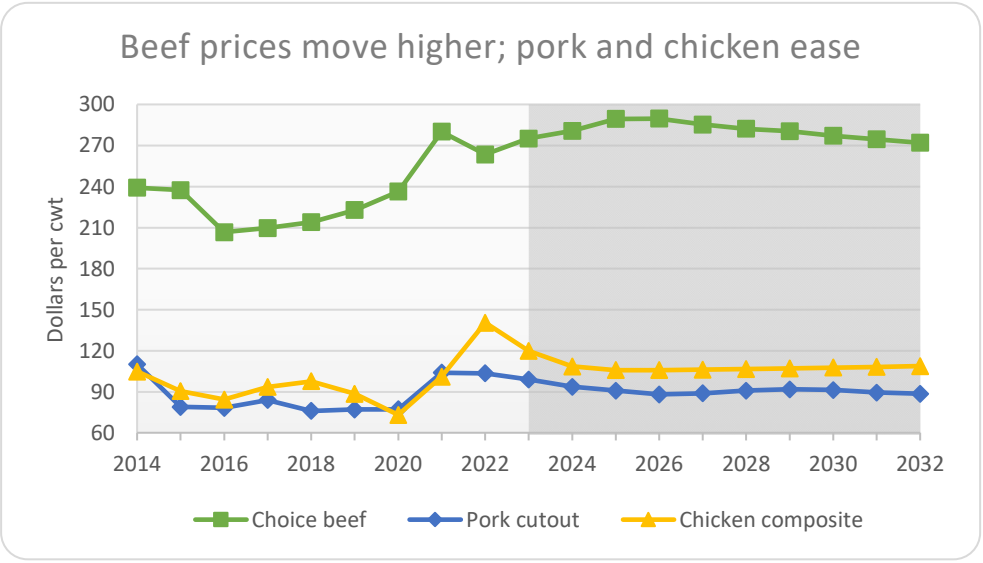


Fed steer prices could set a record high in 2023 as beef production declines, even if consumer demand for beef retreats from recently strong levels. Though feeder steer prices are also expected to increase, high feed costs limit the amount that feedlots are able to bid for feeder animals. Increasing cattle prices are likely to continue until the beef cow herd can be replenished following many years of decline.



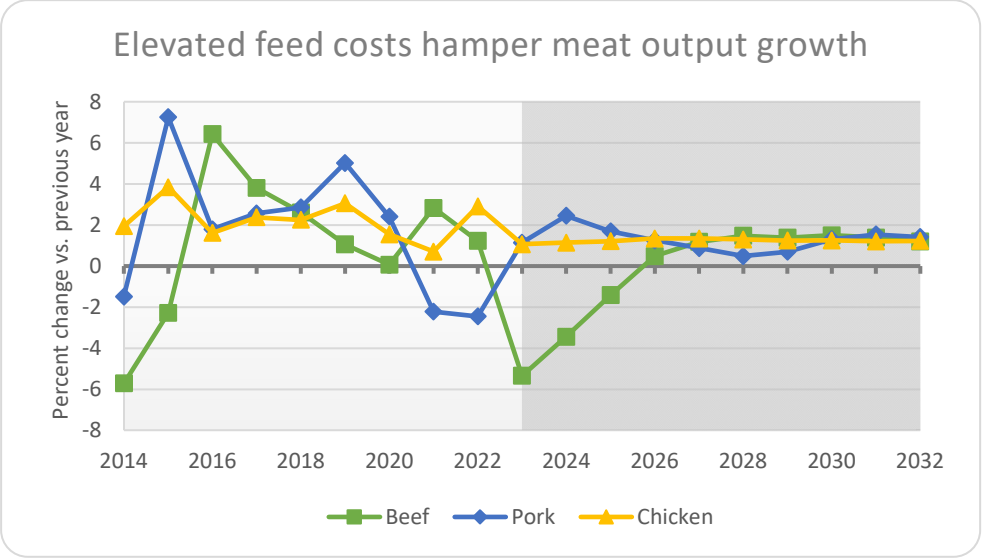
Hog producer profitability falls again in 2023 as hog prices decline at a faster rate than feed costs. Breeding herd numbers are likely to remain relatively stable for the next couple of years, leaving productivity growth as the biggest contributor to modest pork production increases. The growth in pork production per sow is expected to rebound toward historically average levels after declining in 2022.



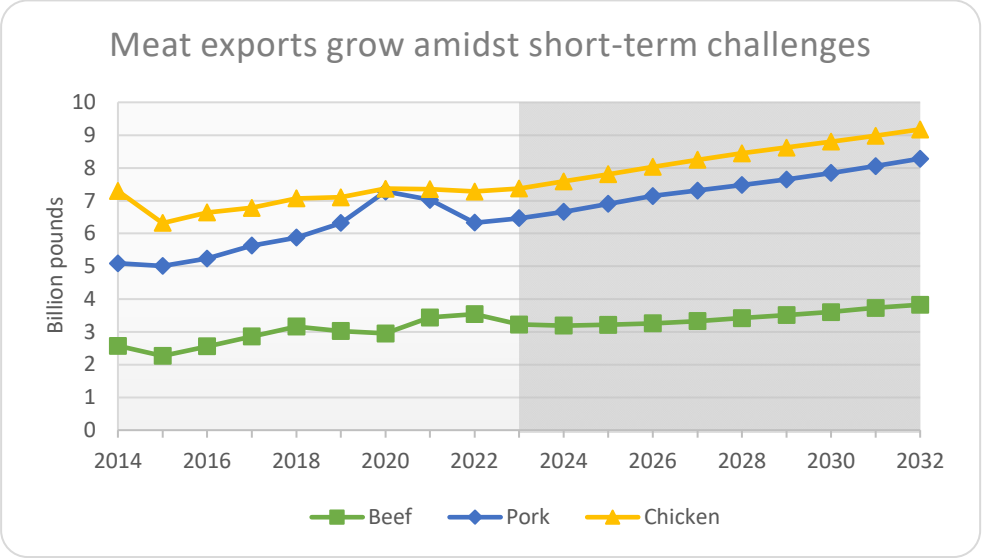


Meat

Consumers have paid higher prices and purchased increasing amounts of meat in recent years. Per-capita meat availability in 2022 saw its eighth consecutive year of growth. That year also yielded record high wholesale prices for chicken and turkey, the second highest choice boxed beef price and the third highest pork cutout price. As meat demand has weakened in recent months, wholesale pork and poultry prices are expected to decline this year, while beef prices increase due to tighter supply.



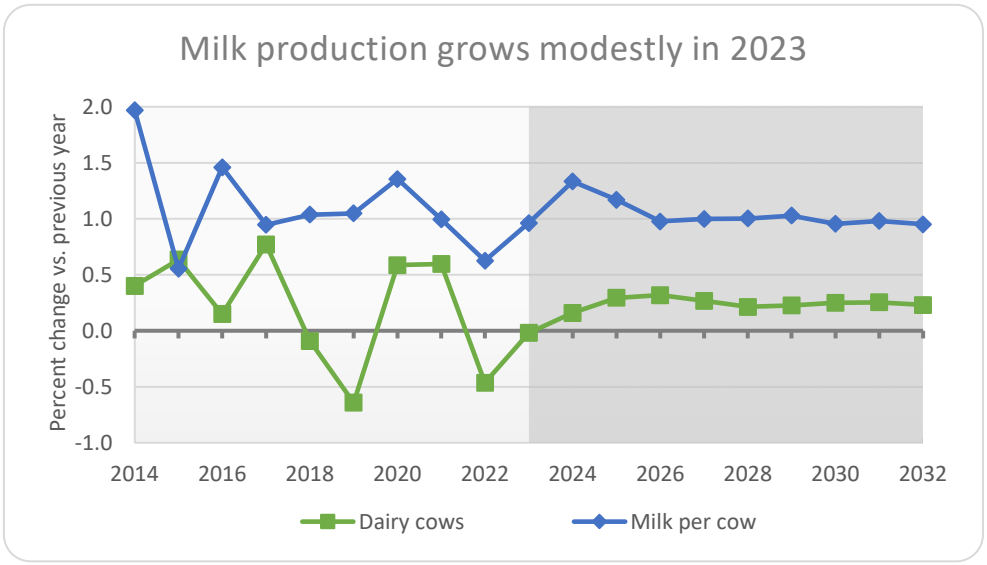
Total meat production is projected to grow at a much slower rate for the next few years as feed costs remain elevated. Beef production declines through 2025 given the multi-year decline in beef cow inventory. Less meat availability per U.S. resident keeps retail prices at or near record levels for many meat products.



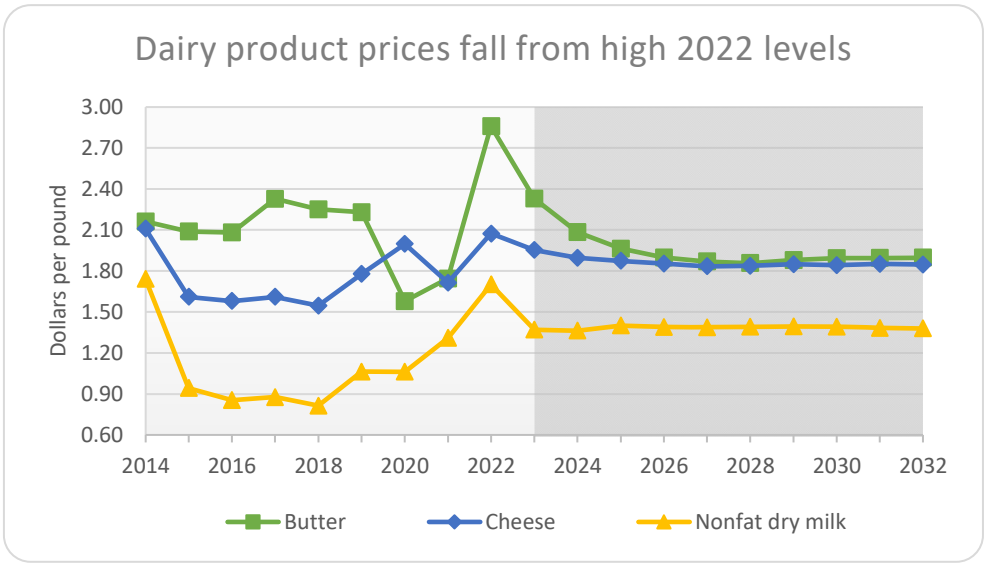
The volume of U.S. meat exports declined in 2022 for the first time since 2015. Export volumes have struggled due to China's recovery from African Swine Fever, a stronger U.S. dollar, and pandemic-related challenges to consumers in key markets. However, the total value of meat exports was at a record high. Export volumes continue to be challenged by many of these factors and weaker meat production growth in the years to come.

Dairy

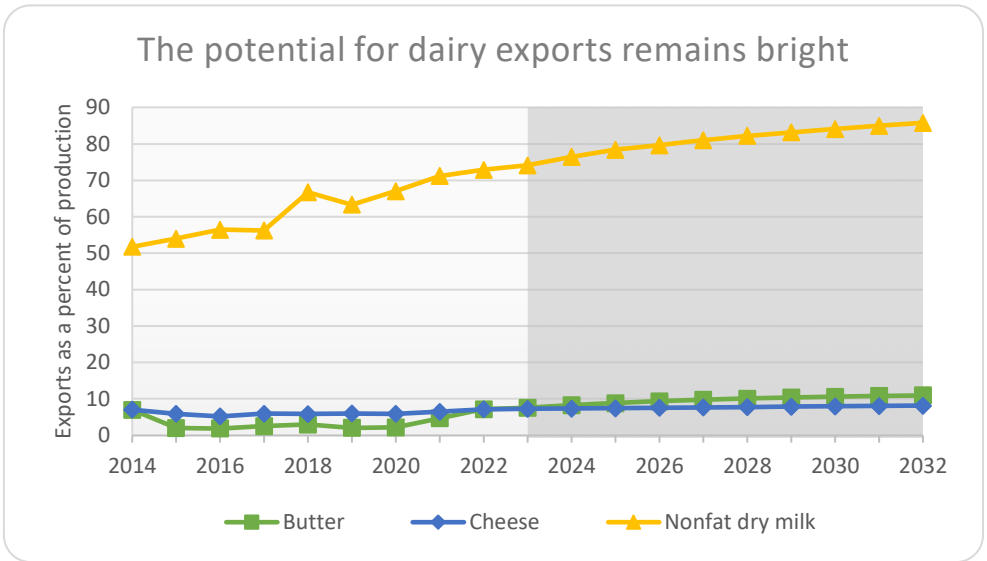
Monthly dairy cow numbers are largely unchanged since March 2022 despite record-high milk prices last spring. High input costs are pressuring margins and keeping producers cautious about expanding the milking herd. Last year, leap-year adjusted milk production per cow grew at the slowest rate since 2015. Modest productivity growth is projected for this year, leading to a milk production increase of just less than 1%.



Even with below-average milk production growth, dairy product prices should ease in 2023 as consumer demand weakens. Though prices decline from relatively high levels in 2022, they remain above 2010-19 average levels. Cheese prices decline less than butter and nonfat dry milk, bringing Class III and Class IV milk prices into close alignment following large gaps between these two prices in 2020 and 2022.



The value of U.S. dairy product exports in 2022 was 47% higher than just two years prior. There is further growth potential in the years to come as other large dairy exporting nations encounter increasing environmental regulations and other challenges. Though exports of butter and cheese make up a relatively small percentage of production, projected increases in exports provide new demand for industry growth.



Cattle sector

Calendar year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
					(Million head)						
Beef cows (Jan. 1)	30.1	29.0	28.2	27.8	27.9	28.2	28.6	29.1	29.5	29.7	29.8
Dairy cows (Jan. 1)	9.4	9.4	9.4	9.4	9.5	9.5	9.5	9.5	9.6	9.6	9.6
Cattle and calves (Jan. 1)	91.9	89.1	87.5	87.0	87.1	87.4	87.8	88.4	89.1	89.8	90.4
Cattle on feed (Jan. 1)	14.7	14.3	13.6	13.3	13.2	13.2	13.3	13.4	13.5	13.6	13.7
Calf crop	34.6	33.5	33.0	32.8	33.0	33.3	33.7	34.1	34.4	34.6	34.7
Calf death loss	34.8	32.9	31.4	30.8	30.7	30.9	31.2	31.4	31.7	31.9	32.1
Cattle imports	1.6	1.8	1.9	1.9	1.9	2.0	2.0	2.0	2.0	2.0	2.0
Cattle exports	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Prices					(Dollars per hundredweight)						
Total all grades, 5 Area Direct Steers	144.40	155.51	160.21	163.37	163.42	158.88	155.96	153.77	150.43	147.69	144.92
600-650#, Oklahoma City Feeder Steers	181.51	196.28	214.38	223.14	224.72	217.98	213.97	210.73	205.96	202.13	198.36
Utility cows, Sioux Falls	76.07	82.84	87.49	90.91	91.20	87.50	84.82	82.63	79.68	77.26	74.89
Cow-calf returns					(Dollars per cow)						
Receipts	897.42	961.60	1,034.39	1,065.96	1,063.28	1,032.95	1,013.07	994.52	972.78	952.78	933.96
Feed expenses	500.14	492.60	454.79	437.68	431.62	431.47	436.65	443.77	450.86	458.08	464.45
Non-feed expenses	292.72	329.82	338.19	330.43	329.36	330.46	333.58	336.88	339.39	342.70	346.32
Net returns	104.55	139.18	241.41	297.85	302.30	271.03	242.84	213.87	182.53	152.00	123.18

All projections are averages across 500 stochastic outcomes.

Hog sector

Calendar year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
					(Million head)						
Breeding herd (Dec. 1*)	6.13	6.15	6.15	6.14	6.13	6.08	6.01	5.96	5.96	5.97	5.97
Market hogs (Dec. 1*)	68.3	67.0	68.7	69.5	70.0	70.4	70.4	70.3	70.6	71.3	71.9
Sows farrowed	11.90	12.04	12.08	12.10	12.08	11.99	11.89	11.86	11.89	11.93	11.94
Pig crop	131.8	134.7	136.5	138.1	139.2	139.4	139.5	140.3	142.0	143.7	145.1
Barrow and gilt slaughter	122.0	123.0	125.5	127.0	128.2	128.8	128.9	129.3	130.5	132.0	133.4
Hog imports	6.6	6.4	6.3	6.2	6.2	6.2	6.2	6.2	6.2	6.2	6.2
Hog exports	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Price					(Dollars per hundredweight)						
Natl. base 51-52% lean equivalent Barrows and Gilts	71.21	65.89	58.16	56.35	55.67	55.81	56.73	57.27	56.80	55.33	54.50
Farrow-finish returns											
Receipts	77.21	71.32	62.72	60.39	59.69	59.84	60.77	61.32	60.84	59.35	58.51
Feed expenses	46.07	44.89	36.97	34.56	33.31	32.47	31.93	31.43	30.81	30.41	29.90
Non-feed expenses	25.34	25.02	24.06	23.69	23.74	23.98	24.22	24.43	24.64	24.89	25.15
Net returns	5.80	1.40	1.69	2.15	2.65	3.39	4.62	5.46	5.39	4.05	3.46

* Preceding year

All projections are averages across 500 stochastic outcomes.

Meat sector

Calendar year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Beef					(Million pounds)						
Production	28,360	26,845	25,921	25,555	25,682	25,984	26,369	26,734	27,136	27,513	27,842
Imports	3,376	3,450	3,509	3,548	3,543	3,520	3,484	3,459	3,439	3,409	3,398
Domestic use	28,170	27,126	26,282	25,903	25,958	26,163	26,421	26,668	26,952	27,175	27,396
Exports	3,542	3,226	3,189	3,217	3,257	3,325	3,417	3,511	3,606	3,732	3,830
Ending stocks	700	643	602	585	594	609	625	639	655	671	685
Pork											
Production	27,010	27,318	27,989	28,463	28,819	29,073	29,216	29,421	29,806	30,264	30,692
Imports	1,344	1,175	1,164	1,148	1,137	1,129	1,135	1,141	1,145	1,145	1,145
Domestic use	21,966	22,010	22,456	22,687	22,798	22,884	22,868	22,903	23,086	23,331	23,537
Exports	6,334	6,466	6,662	6,905	7,142	7,308	7,478	7,651	7,849	8,060	8,283
Ending stocks	500	516	552	571	586	596	601	608	623	641	658
Broiler											
Production	45,714	46,199	46,729	47,294	47,931	48,577	49,207	49,820	50,441	51,050	51,675
Domestic use	38,466	39,022	39,289	39,642	40,056	40,490	40,920	41,360	41,803	42,231	42,665
Exports	7,282	7,372	7,590	7,810	8,033	8,247	8,449	8,624	8,803	8,983	9,175
Ending stocks	850	835	849	856	864	871	877	882	888	893	899
Turkey											
Production	5,222	5,494	5,683	5,750	5,801	5,843	5,872	5,894	5,912	5,926	5,939
Domestic use	4,906	5,169	5,293	5,327	5,356	5,384	5,407	5,424	5,439	5,449	5,458
Exports	405	408	436	462	483	497	505	511	515	519	523
Ending stocks	165	202	232	242	249	255	260	264	267	270	273
Wholesale prices					(Dollars per hundredweight)						
Boxed beef cutout	263.53	275.21	280.80	289.53	289.73	285.44	282.35	280.56	277.15	274.61	272.04
Pork cutout value	103.61	99.11	93.71	90.86	88.11	88.89	90.90	91.80	91.41	89.54	88.59
					(Cents per pound)						
National wholesale broiler	140.50	119.95	108.55	105.94	105.91	106.31	106.64	107.17	107.80	108.26	108.85
National wholesale turkey hens	154.50	137.59	119.83	117.24	117.47	117.85	118.05	118.58	118.88	119.11	119.62
Retail prices					(Dollars per pound)						
Beef	7.59	7.77	7.87	8.02	8.05	8.00	7.93	7.90	7.85	7.82	7.79
Pork	4.90	4.87	4.76	4.67	4.64	4.69	4.77	4.84	4.83	4.80	4.78
Broiler	2.43	2.40	2.32	2.28	2.29	2.30	2.33	2.36	2.39	2.42	2.45
Per-capita consumption					(Pounds)						
Beef	59.2	56.8	54.7	53.7	53.5	53.7	54.0	54.2	54.5	54.7	54.9
Pork	51.2	51.1	51.9	52.1	52.1	52.1	51.8	51.6	51.8	52.1	52.3
Broiler	99.2	100.2	100.4	100.8	101.4	102.0	102.5	103.1	103.7	104.3	104.9
Turkey	14.7	15.5	15.8	15.8	15.8	15.8	15.8	15.7	15.7	15.7	15.6
Total	224.3	223.5	222.8	222.4	222.8	223.5	224.0	224.7	225.7	226.7	227.6

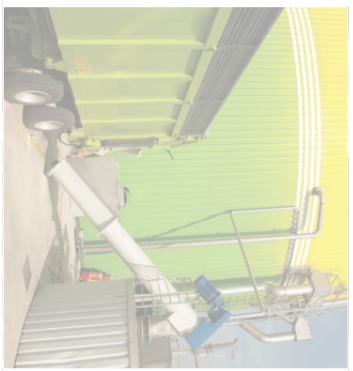
All projections are averages across 500 stochastic outcomes.

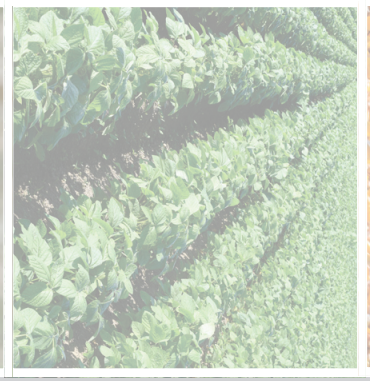
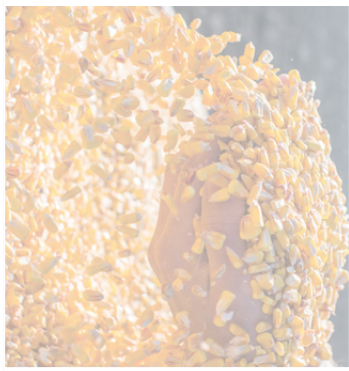
Dairy sector

Calendar year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Milk supply											
Dairy cows (thousand head)	9,404	9,403	9,418	9,445	9,476	9,501	9,521	9,543	9,567	9,591	9,613
California	1,723	1,726	1,722	1,719	1,718	1,715	1,712	1,710	1,709	1,709	1,710
Wisconsin	1,272	1,272	1,274	1,274	1,274	1,273	1,271	1,270	1,269	1,267	1,266
New York	624	621	621	620	619	618	617	616	615	615	614
Idaho	656	662	670	680	691	701	710	719	728	735	742
Pennsylvania	468	463	459	455	452	448	445	441	438	435	432
Minnesota	453	447	444	442	439	437	434	431	429	427	425
Texas	646	666	682	696	709	721	731	740	749	756	763
Michigan	428	428	432	436	439	441	443	445	447	449	450
New Mexico	288	276	271	270	270	269	269	268	268	268	269
Ohio	250	246	243	242	241	240	238	237	236	234	233
Rest of U.S.	2,597	2,596	2,601	2,612	2,625	2,638	2,651	2,665	2,680	2,696	2,711
Milk yield (lbs per cow)	24,098	24,329	24,721	24,942	25,186	25,438	25,763	25,957	26,205	26,462	26,787
Milk production (billion lbs)	226.6	228.8	232.8	235.6	238.6	241.7	245.3	247.7	250.7	253.8	257.5
Minimum FMMO class prices					(Dollars per hundredweight)						
Class I mover	23.66	20.02	19.15	18.96	18.63	18.46	18.45	18.59	18.57	18.58	18.55
Class II	25.27	20.03	18.93	18.74	18.38	18.23	18.21	18.33	18.36	18.31	18.29
Class III	21.96	19.27	18.64	18.45	18.17	17.95	17.97	18.12	18.06	18.13	18.08
Class IV	24.47	19.33	18.23	18.04	17.68	17.53	17.51	17.63	17.66	17.61	17.59
All milk price	25.55	21.62	20.77	20.57	20.25	20.07	20.07	20.21	20.19	20.21	20.17
Actual dairy prod. margin	10.73	7.85	9.08	9.61	9.79	9.87	9.98	10.19	10.26	10.31	10.33
Wholesale prices					(Dollars per pound)						
Butter, CME	2.86	2.33	2.08	1.96	1.90	1.87	1.86	1.88	1.89	1.90	1.90
Cheese, American, 40#, CME	2.07	1.95	1.90	1.87	1.85	1.83	1.84	1.85	1.84	1.85	1.85
Nonfat dry milk, AA	1.70	1.37	1.36	1.40	1.39	1.39	1.39	1.39	1.39	1.38	1.38
Dairy product production					(Million pounds)						
American cheese	5,551	5,615	5,723	5,810	5,906	6,000	6,109	6,192	6,284	6,382	6,491
Other cheese	8,406	8,530	8,717	8,854	8,996	9,135	9,293	9,416	9,549	9,691	9,856
Butter	2,054	2,095	2,165	2,210	2,260	2,309	2,369	2,393	2,439	2,483	2,543
Nonfat dry milk	2,491	2,510	2,655	2,758	2,879	2,972	3,045	3,105	3,168	3,235	3,300
Dairy product exports											
American cheese	261	277	288	298	309	319	331	342	353	364	375
Other cheese	731	746	773	793	816	837	861	883	906	929	952
Butter	148	158	179	195	212	226	238	248	258	268	279
Nonfat dry milk	1,816	1,860	2,029	2,163	2,293	2,409	2,503	2,583	2,664	2,748	2,830
Per-capita consumption					(Pounds)						
Butter	6.0	6.1	6.2	6.3	6.4	6.4	6.5	6.6	6.6	6.7	6.8
Nonfat dry milk	2.0	1.9	1.9	1.8	1.7	1.6	1.6	1.5	1.4	1.4	1.3
Total cheese	39.9	40.2	40.7	41.1	41.5	41.9	42.3	42.7	43.0	43.4	43.9
American	16.0	16.0	16.2	16.4	16.5	16.7	16.9	17.0	17.2	17.3	17.5
Other	23.9	24.2	24.5	24.7	25.0	25.2	25.5	25.6	25.8	26.1	26.4
Total fluid milk	148.6	147.0	144.7	142.3	139.8	137.5	135.1	133.0	130.8	128.6	126.5

All projections are averages across 500 stochastic outcomes.



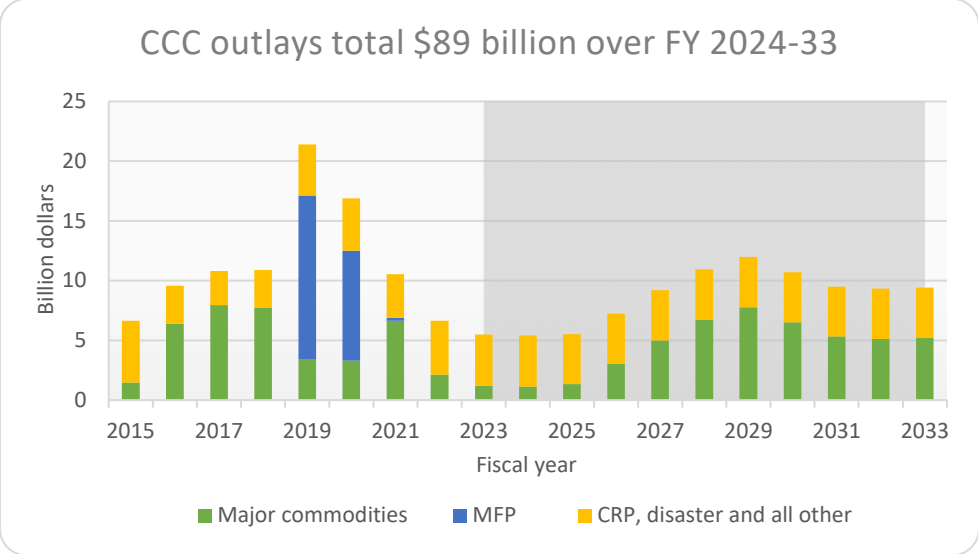


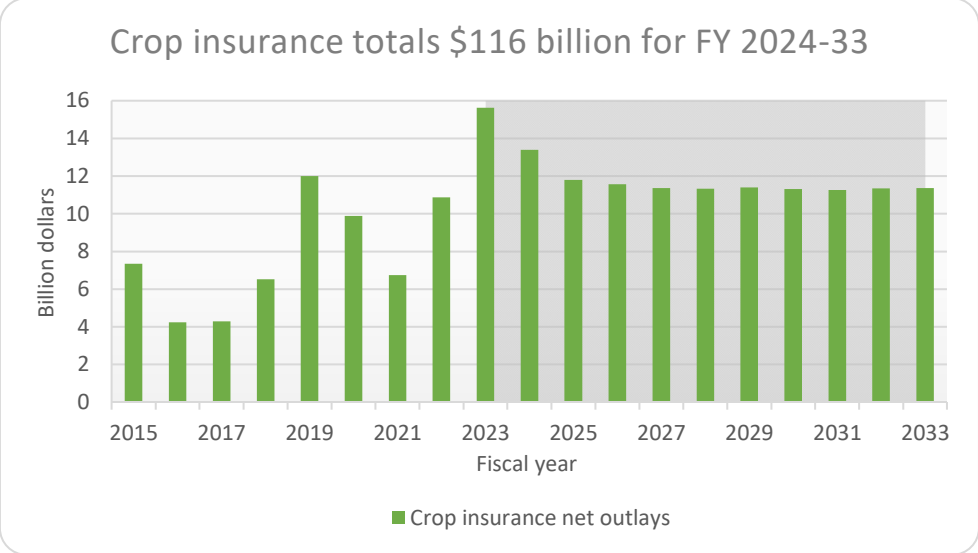
Aggregate indicators

Government costs

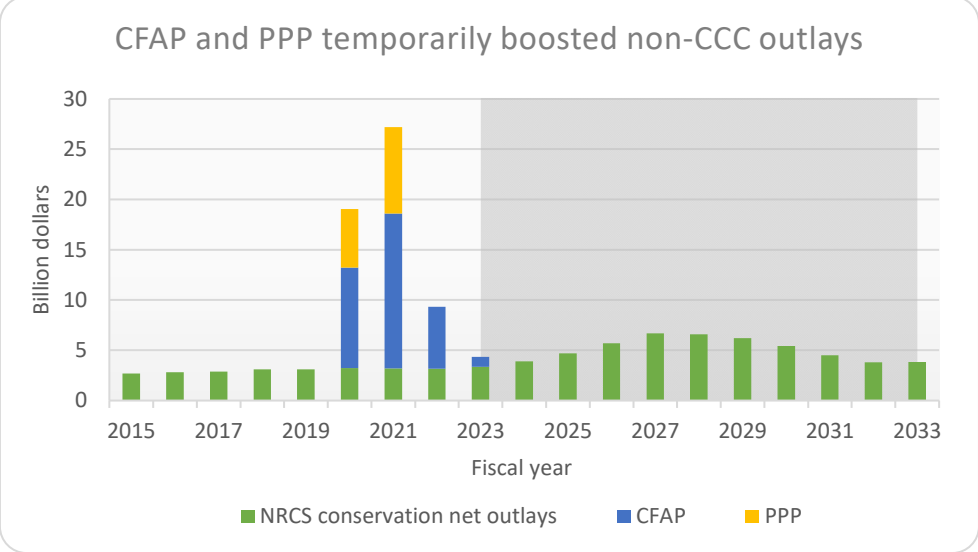
Net Commodity Credit Corporation (CCC) outlays peaked in FY 2019 because of $13.7 billion in market facilitation program (MFP) payments. Net CCC outlays drop to $5.5 billion in FY 2023, given modest ARC and PLC payments for crops harvested in 2022. Between FY 2024 and FY 2033, net CCC outlays total $89.2 billion, with major commodity programs accounting for $47 billion.

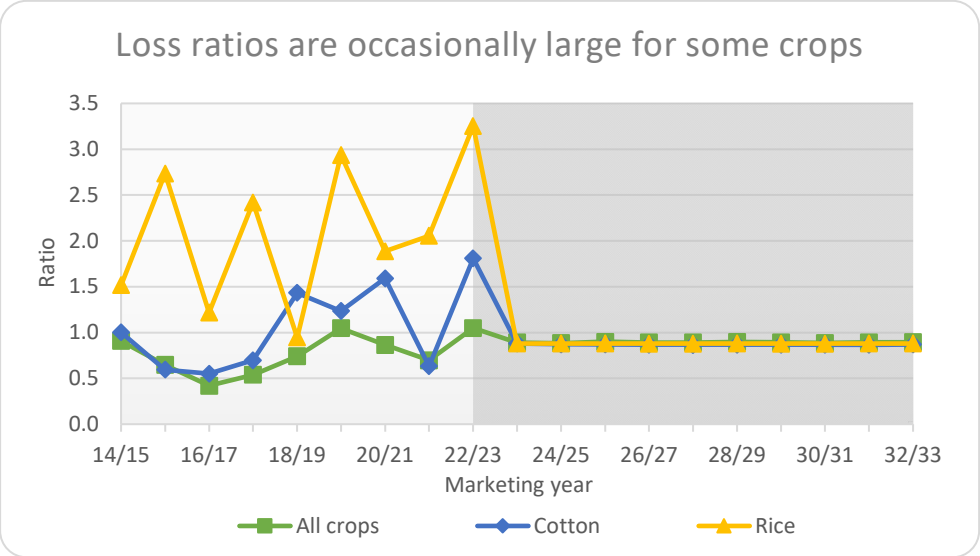


In FY 2023, higher market prices increased the value of crops insured and thus the value of premium subsidies and other program costs. When combined with drought-induced production declines, this spiked net outlays. Baseline assumptions of more normal variability following FY 2023, particularly in yields, result in a projected average loss ratio of about 0.9, although this is still subject to large swings due to weather and other factors. Program fiscal costs total $116 billion between FY 2024 and FY 2033.



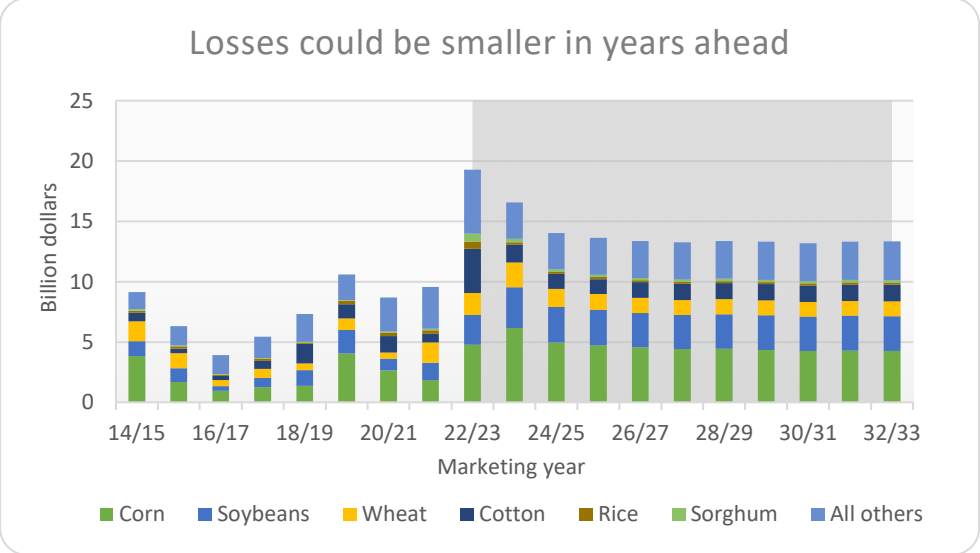
Coronavirus food assistance program (CFAP) is not treated as part of CCC outlays, and paycheck protection program (PPP) was not operated by USDA, but both provided substantial benefits to farmers. The Natural Resources Conservation Service (NRCS) operates several mandatory conservation programs. Spending on those programs total $51 billion over FY 2024 to 2033. The conservation reserve program (CRP) is managed by the Farm Service Agency, and its outlays are included in the CCC accounts.



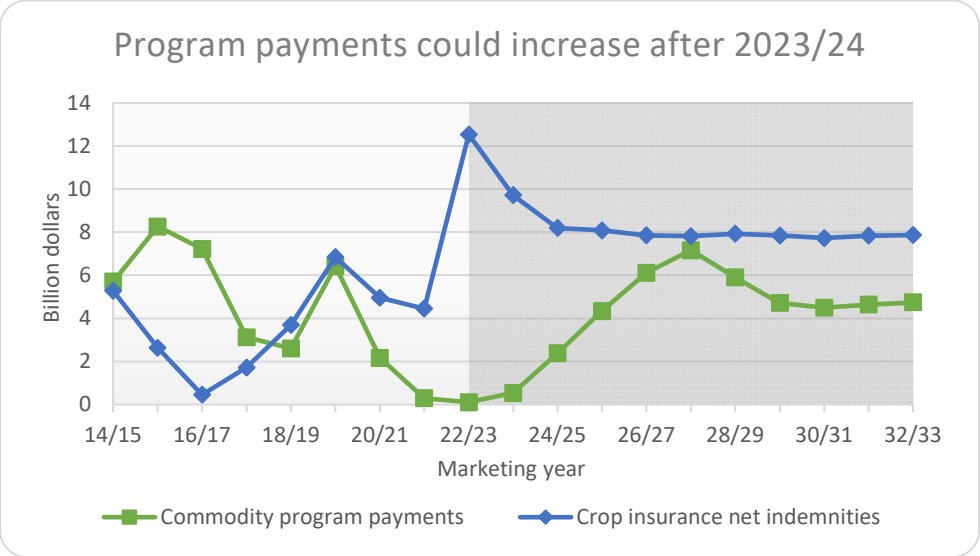


Crop insurance

Larger losses across a few major crops led to higher total losses for the crop insurance program in 2022. The loss ratio (indemnity payments divided by total premiums, including both producer-paid and government subsidized premiums) was greater than 1.0 again in 2022. In the projection period, the distribution of yields, indemnities and premiums results in an average loss ratio of near 0.9, though individual years may be much lower or higher.



Higher prices and larger crop losses lead to total indemnities approaching $20 billion for the crop insurance program in 2022/23. Possible lower prices ahead could lead to lower total indemnities as the value of insured crops shrink. Indemnities in future years could be larger or smaller than shown here depending on prices, yields, occurrence of loss events and other factors. After 2023/24, total indemnities are projected to average $13.4 billion dollars.

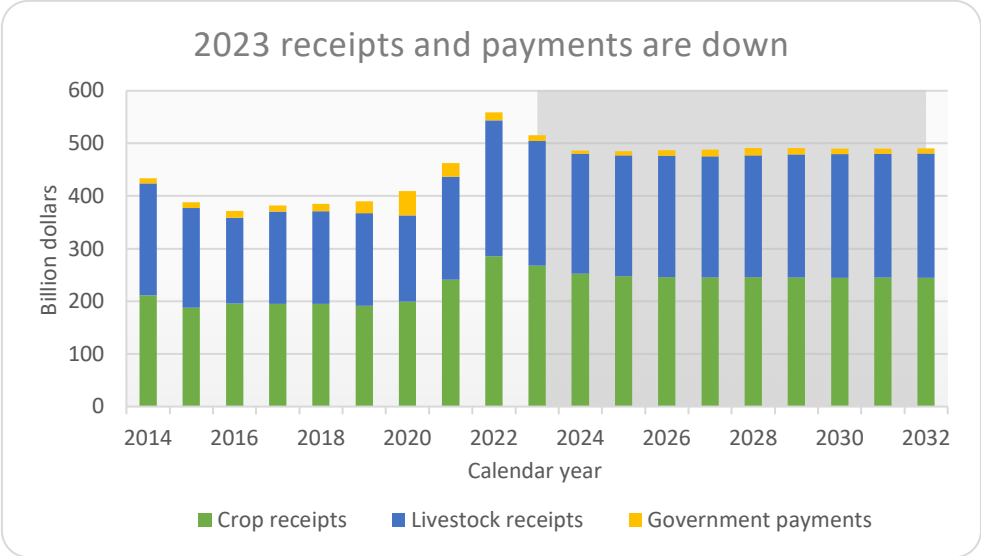


In some years commodity program payments can be similar in dollar value to crop insurance net indemnities. However, in recent years crop insurance net indemnities have exceeded commodity program payments as market prices and revenues generally stayed above the levels which trigger program payments.

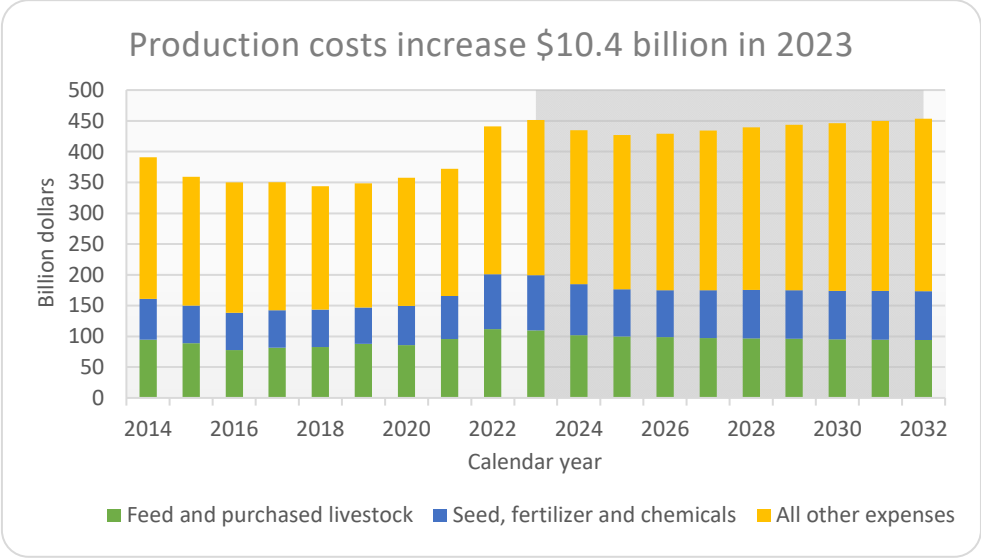
In the future, as market prices fall and policy trigger levels adjust higher, total ARC and PLC program payments could again approach similar levels as crop insurance net indemnities.

Farm income, expenses

In 2022, farm cash receipts from both livestock sales and crop receipts increased, more than compensating for lower government payments, thereby increasing combined revenue. Crop and livestock receipts decrease by a total of $39 billion in 2023, and projected government payments decline by $5 billion in the assumed absence of new programs. In later years, receipts increase at a modest pace, while payments are relatively stable.

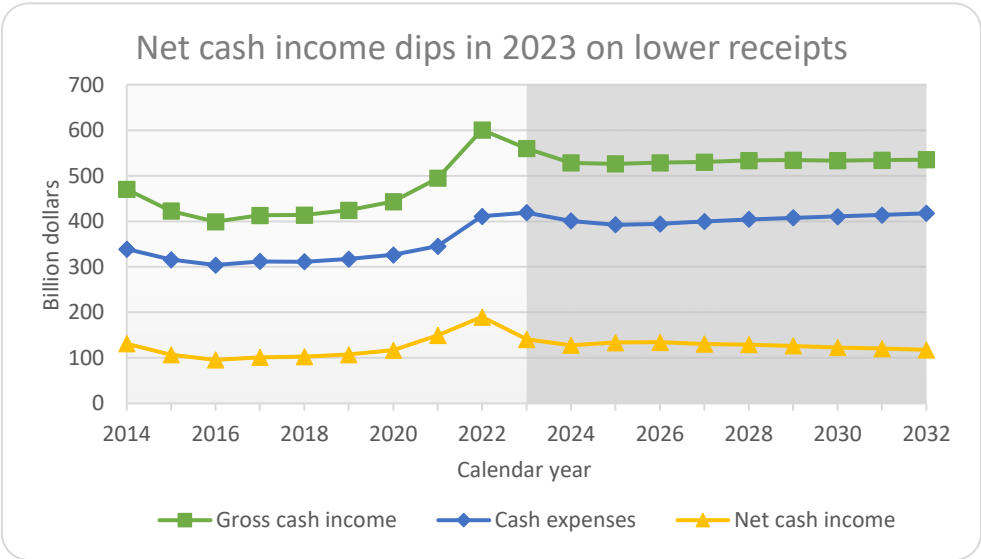


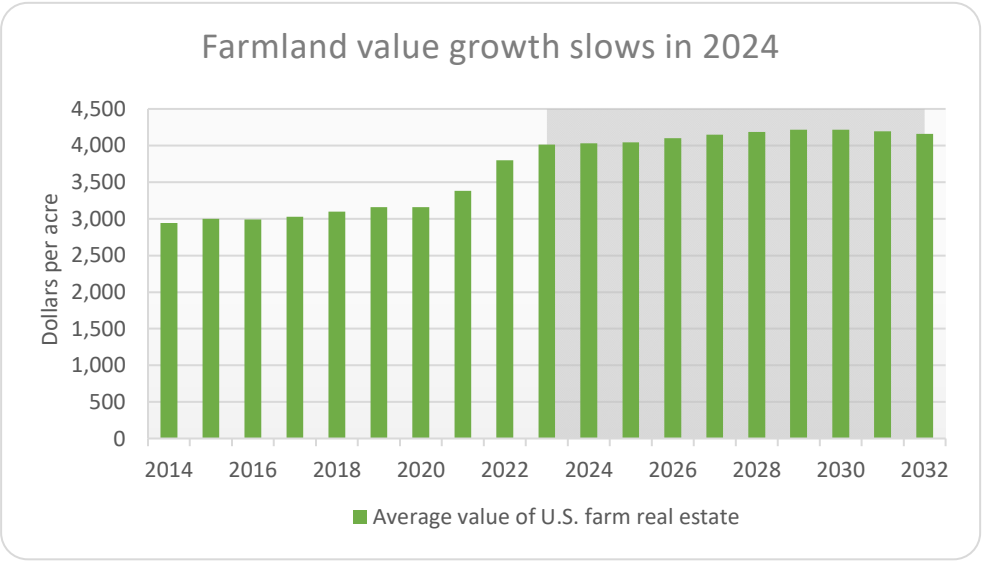
Farm production expenses rose in in 2022, largely because of higher feed, fertilizer and fuel prices. In 2023 total expenses increase by $10.4 billion (2%) with higher costs for interest, labor and seed more than offsetting a decline in feed, fertilizer and fuel expenses. Projected production expenses increase by an average of 0.2%/year from 2023 to 2032, reflecting increasing production expenses following a decline in costs in 2024 and 2025.



Net cash income for the farm sector increased in 2022, despite a decline in government payments as both crop receipts and livestock receipts increased. Net cash income declines in 2023, as the reduction in government payments and the increase in production expenses combine with a decrease in cash receipts. Net cash income drops again in 2024 due to a further decline in payments and receipts that more than compensate for a decline in expenses.

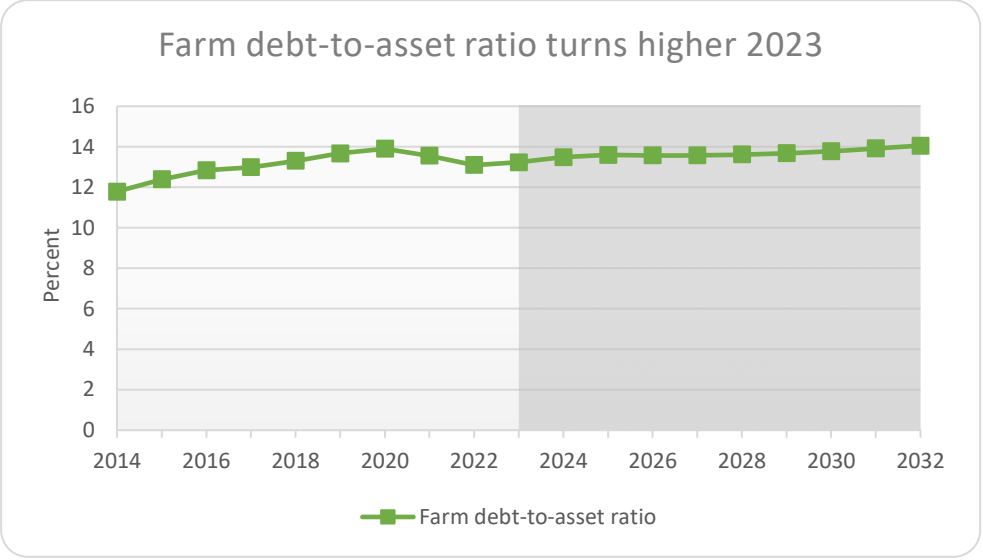
Net farm income is an alternative measure that accounts for non-monetary income, depreciation and inventory value changes.



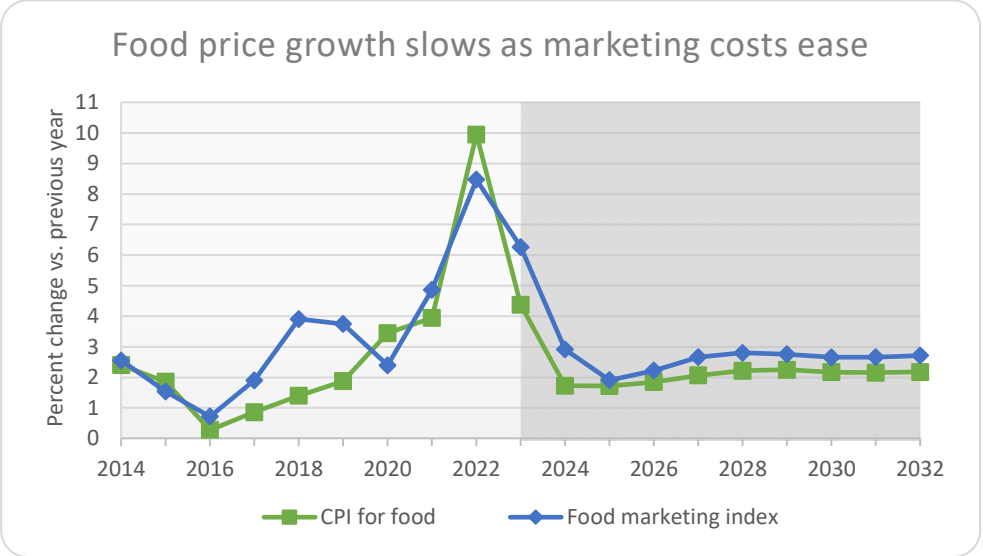


Farm assets and debt

Reports suggest farmland values in many parts of the country continue to rise. Increases in farm income again in 2022 and historically strong farm income in 2023 support a 5% projected increase in farm real estate value in 2023. Declining farm income, combined with increases in interest rates and interest expense, limits upward support for farmland value moving forward.



The national average farm debt-to-asset ratio dropped to its lowest level in decades in 2012, but then increased in every year through 2020. The projected increase in farm asset values in 2021 and 2022 allowed the debt-to-asset ratio to stabilize, and actually dip slightly. Beginning again in 2023, greater farm debt causes the ratio to resume its increase, suggesting that long-term concerns about the status of farm finances could grow.



Consumer food prices

Commodity prices combined with an index of producer prices for labor, fuel and other portions of the food supply chain correlates well with historical changes in the CPI for food. Though farm-level costs for most food commodities are projected to decline in 2023 and 2024, continued growth in the cost of marketing food will keep food inflation higher than what farm commodity price moves alone would suggest.

Net government outlays

Fiscal year	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Feed grains					(Million dollars)						
Corn	15	38	60	1,104	2,285	3,319	4,032	3,098	2,319	2,099	2,139
Sorghum	4	7	21	67	125	149	150	129	103	112	126
Barley	9	1	5	31	61	78	97	109	104	112	126
Oats	1	0	0	1	2	4	4	4	3	3	3
Food grains											
Wheat	49	39	47	266	545	941	1,120	1,033	873	892	928
Rice	52	4	148	187	217	217	226	211	198	201	190
Oilseeds											
Soybeans	12	35	57	296	661	950	1,085	891	712	667	660
Peanuts	180	32	188	247	289	310	307	300	297	300	310
Other oilseeds	2	0	0	1	6	25	26	15	11	9	7
Other selected commodities											
Upland cotton/seed cotton	68	146	164	252	224	189	200	186	189	190	200
Dairy	795	810	634	595	585	537	518	527	525	544	516
Subtotal, selected commodities	1,188	1,112	1,324	3,048	4,999	6,721	7,765	6,504	5,332	5,128	5,205
Conservation reserve	1,896	1,884	1,871	1,876	1,891	1,889	1,882	1,866	1,848	1,876	1,876
Other CCC											
Disaster payments, NAP	814	785	766	755	761	761	761	761	761	761	761
All other (incl. Charter Act use)	1,607	1,621	1,567	1,556	1,557	1,561	1,563	1,561	1,562	1,563	1,565
Net CCC outlays	5,505	5,401	5,527	7,235	9,209	10,932	11,971	10,692	9,503	9,328	9,406
NRCS conservation	3,346	3,878	4,680	5,682	6,672	6,587	6,217	5,422	4,481	3,797	3,837
Crop insurance	15,625	13,389	11,802	11,560	11,357	11,330	11,400	11,316	11,249	11,336	11,367
Selected other non-CCC											
Pandemic assistance	983	0	0	0	0	0	0	0	0	0	0
Other non-CCC emergency	4,000	0	0	0	0	0	0	0	0	0	0
Total mandatory outlays	29,458	22,668	22,009	24,478	27,239	28,849	29,588	27,429	25,233	24,461	24,610

Note: "NRCS Conservation" denotes mandatory spending on conservation programs authorized by the 2002, 2008, 2014 and 2018 farm bills that is not included in reported CCC outlays. "NAP" is the Noninsured Crop Disaster Assistance Program.
Fiscal years begin on October 1 of the previous calendar year (FY 2023: Oct. 1, 2022-Sep. 30, 2023).
All projections are averages across 500 stochastic outcomes.

Selected direct government payments

Marketing year	22/23	23/24	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33
						(Million dollars)					
ARC payments	98	113	1,365	2,928	4,272	5,086	3,607	2,620	2,347	2,289	2,211
PLC payments	11	397	928	1,338	1,769	2,005	2,206	2,006	2,036	2,220	2,420
Marketing loans	0	24	82	75	73	78	90	92	120	132	112
Total	1,092	535	2,374	4,341	6,114	7,168	5,903	4,717	4,504	4,642	4,742

Note: Includes selected payments for feed grains, food grains, oilseeds and cotton.

All projections are averages across 500 stochastic outcomes.

Crop insurance

Year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
						(Million dollars, crop year)					
Total premiums	18,394	18,630	15,959	15,306	15,109	14,997	15,026	15,025	14,985	15,002	15,005
Producer-paid premiums	6,762	6,865	5,903	5,666	5,587	5,541	5,552	5,553	5,538	5,545	5,547
Premium subsidies	11,632	11,765	10,056	9,640	9,522	9,456	9,474	9,473	9,447	9,457	9,458
Total indemnities	19,301	16,585	14,094	13,747	13,443	13,355	13,483	13,397	13,266	13,383	13,416
						(Ratio of indemnities to total premiums)					
Loss ratio	1.05	0.89	0.88	0.90	0.89	0.89	0.90	0.89	0.89	0.89	0.89
						(Million dollars, crop year)					
Net indemnities	12,539	9,720	8,191	8,082	7,856	7,813	7,931	7,844	7,728	7,838	7,869
Corn	2,367	3,616	2,917	2,901	2,752	2,654	2,726	2,628	2,541	2,571	2,568
Soybeans	991	1,984	1,729	1,739	1,661	1,671	1,686	1,685	1,664	1,699	1,699
Wheat	1,222	1,225	898	805	771	774	776	764	737	752	753
Upland cotton	3,120	1,012	862	852	890	921	928	938	949	948	958
All other	4,839	1,883	1,784	1,785	1,782	1,792	1,814	1,830	1,838	1,870	1,891
						(Million dollars, fiscal year)					
Net outlays	10,867	15,625	13,389	11,802	11,560	11,357	11,330	11,400	11,316	11,249	11,336

All projections are averages across 500 stochastic outcomes.

Farm cash receipts

Calendar year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
					(Billion dollars)						
Feed grains	103.58	96.53	85.48	81.62	80.35	79.20	78.32	77.48	76.88	76.38	75.61
Food grains	17.89	16.72	15.52	14.87	14.32	14.15	14.02	13.94	13.85	13.87	13.80
Oilseeds	67.27	60.19	55.67	54.65	54.01	53.90	54.00	54.09	54.12	54.18	54.04
Cotton	8.53	7.16	7.08	7.29	7.77	8.09	8.19	8.19	8.19	8.17	8.14
Sugar	3.15	3.12	3.20	3.13	3.12	3.13	3.11	3.16	3.17	3.10	3.05
Other crops	85.32	83.90	85.49	86.24	86.55	86.73	88.03	88.47	88.73	89.49	90.27
Cattle	86.80	88.43	90.84	92.97	93.88	92.12	91.49	91.22	90.30	89.63	88.85
Hogs	29.38	27.96	25.27	24.88	24.88	25.17	25.70	26.12	26.24	25.96	25.94
Dairy products	57.73	49.12	47.95	48.07	47.91	48.07	48.79	49.60	50.14	50.82	51.46
Poultry, eggs	76.34	63.98	56.51	55.72	56.16	56.93	57.71	58.61	59.51	60.35	61.27
Other livestock	7.45	7.38	7.37	7.48	7.61	7.73	7.87	8.02	8.15	8.27	8.41
Total cash receipts	543.43	504.49	480.38	476.94	476.57	475.21	477.22	478.89	479.26	480.22	480.84

All projections are averages across 500 stochastic outcomes.

Farm production expenses

Calendar year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
					(Billion dollars)						
Feed	76.59	72.34	62.48	59.00	57.61	57.01	56.77	56.60	56.45	56.43	56.22
Purchased livestock	35.42	37.17	39.70	41.04	41.39	40.39	39.90	39.57	38.94	38.43	37.89
Seed	21.98	23.42	24.36	24.78	24.94	24.99	25.04	25.11	25.18	25.27	25.38
Fertilizer	42.50	42.11	35.50	30.57	29.28	30.77	31.37	31.09	30.52	30.28	30.42
Chemicals	24.36	24.46	22.68	21.18	21.53	21.88	22.24	22.61	22.97	23.34	23.72
Fuels and electricity	27.14	26.45	22.69	22.34	22.75	23.41	24.00	24.46	24.93	25.52	26.17
Interest	27.64	33.57	35.53	35.51	35.90	36.53	37.08	37.50	37.83	38.10	38.30
Contract and hired labor	39.20	40.60	42.29	43.62	44.86	46.04	47.51	48.77	50.04	51.49	53.03
Capital consumption	27.26	29.11	30.01	30.52	30.96	31.37	31.74	32.07	32.33	32.50	32.59
Rent to landlords	19.83	20.80	21.05	20.76	20.83	21.05	21.24	21.38	21.36	21.22	21.04
All other	99.40	101.65	98.45	97.88	99.13	101.11	102.92	104.43	105.81	107.34	109.02
Total production expenses	441.32	451.68	434.74	427.19	429.16	434.54	439.80	443.58	446.36	449.91	453.79

All projections are averages across 500 stochastic outcomes.

Farm income indicators

Calendar year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
					(Billion dollars)						
1. Farm receipts	585.42	549.50	522.65	518.50	518.24	517.23	519.83	522.01	522.83	524.47	525.78
Crops	285.73	267.63	252.45	247.81	246.12	245.20	245.67	245.33	244.93	245.18	244.91
Livestock	257.70	236.86	227.94	229.13	230.45	230.02	231.55	233.56	234.33	235.04	235.93
Farm-related	41.99	45.01	42.26	41.56	41.67	42.02	42.61	43.12	43.57	44.25	44.94
2. Government payments	15.61	10.40	5.83	7.91	10.47	12.84	13.82	12.27	10.59	9.76	9.48
3. Gross cash income (1 + 2)	601.03	559.90	528.47	526.40	528.71	530.07	533.65	534.28	533.42	534.23	535.26
4. Non-money income	23.52	24.03	23.47	22.91	22.62	22.43	22.27	22.10	21.87	21.63	21.40
5. Value of inventory Change	-20.50	-0.93	-1.73	-1.50	-1.18	-1.46	-1.21	-0.94	-0.97	-1.12	-1.28
6. Gross farm income (3 + 4 + 5)	604.06	583.00	550.21	547.81	550.15	551.04	554.72	555.44	554.32	554.74	555.38
7. Cash expenses	411.12	419.32	400.85	392.68	394.34	399.43	404.38	407.86	410.42	413.85	417.68
8. Total expenses	441.32	451.68	434.74	427.19	429.16	434.54	439.80	443.58	446.36	449.91	453.79
9. Net cash income (3 - 7)	189.92	140.58	127.62	133.72	134.37	130.64	129.27	126.42	123.00	120.38	117.59
10. Realized net farm income (3 + 4 - 8)	183.24	132.26	117.20	122.12	122.16	117.96	116.13	112.80	108.93	105.95	102.87
11. Net farm income (6 - 8)	162.74	131.33	115.48	120.62	120.99	116.50	114.92	111.86	107.97	104.82	101.59
Deflated (2023 $)	168.66	131.33	112.93	115.57	111.85	103.92	98.91	92.90	86.52	81.05	75.79

All projections are averages across 500 stochastic outcomes.

Land rental rates and real estate values

Calendar year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
Rental rates					(Dollars per acre)						
Cropland	148.00	157.97	160.24	157.90	158.63	160.66	162.55	163.93	163.93	162.90	161.46
Pasture	14.00	15.03	15.03	14.71	14.61	14.55	14.42	14.29	14.12	13.90	13.66
Value of farm real estate	3,800	4,011	4,028	4,042	4,097	4,148	4,187	4,216	4,217	4,194	4,161

All projections are averages across 500 stochastic outcomes.

Land use for major crops and the conservation reserve

Marketing year	22/23	23/24	24/25	25/26	26/27	27/28	28/29	29/30	30/31	31/32	32/33
Planted area					(Million acres)						
Corn	88.58	92.25	92.86	92.50	92.14	90.83	90.02	89.42	88.79	88.32	87.86
Soybeans	87.45	87.22	87.16	87.39	87.25	87.94	88.19	88.36	88.54	88.59	88.67
Wheat	45.74	49.42	47.77	47.01	46.75	46.72	46.60	46.39	46.25	46.23	46.16
Upland cotton	13.58	10.52	11.04	11.31	11.59	11.71	11.73	11.74	11.74	11.71	11.68
Sorghum	6.33	6.18	6.01	6.08	6.12	6.15	6.15	6.15	6.15	6.15	6.16
Barley	2.95	2.83	3.04	2.85	2.77	2.71	2.67	2.65	2.61	2.58	2.55
Oats	2.58	2.51	2.65	2.73	2.81	2.87	2.91	2.95	2.98	3.01	3.04
Rice	2.22	2.55	2.55	2.58	2.57	2.56	2.56	2.57	2.59	2.61	2.61
Canola	2.21	2.11	2.15	2.26	2.30	2.33	2.36	2.39	2.42	2.45	2.48
Sunflowers	1.69	1.79	1.70	1.79	1.76	1.73	1.72	1.72	1.73	1.74	1.74
Peanuts	1.45	1.55	1.54	1.53	1.52	1.51	1.50	1.50	1.50	1.50	1.50
Sugar beets	1.16	1.17	1.19	1.20	1.20	1.21	1.21	1.21	1.21	1.20	1.20
Sugar cane (harvested)	0.94	0.95	0.97	0.99	0.99	1.00	1.01	1.02	1.02	1.02	1.03
13 crop planted area	256.88	261.04	260.64	260.23	259.77	259.24	258.63	258.07	257.54	257.11	256.67
Hay (harvested)	49.55	50.16	50.11	49.69	49.51	49.63	49.90	50.26	50.62	50.99	51.31
13 crops + hay	306.42	311.20	310.75	309.92	309.28	308.88	308.53	308.33	308.16	308.09	307.98
Conservation reserve program (CRP)	22.03	23.01	24.44	25.40	25.95	26.24	26.16	26.01	25.86	25.73	25.62
13 crops + hay + CRP	328.45	334.21	335.19	335.32	335.23	335.11	334.69	334.35	334.02	333.82	333.60
Double-crop soybeans	3.52	4.54	4.08	3.99	3.94	3.91	3.88	3.86	3.84	3.83	3.82
13 crops + hay + CRP - double-crop soybeans	324.94	329.67	331.11	331.32	331.29	331.20	330.81	330.49	330.18	329.99	329.78

All projections are averages across 500 stochastic outcomes.

Balance sheet of the farm sector

Calendar year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
					(Billion dollars)						
Assets	3,848	4,008	4,001	4,005	4,049	4,091	4,122	4,141	4,137	4,116	4,086
Real estate	3,188	3,356	3,368	3,379	3,420	3,458	3,487	3,509	3,509	3,492	3,467
Other assets	660	652	633	626	629	633	635	632	627	623	619
Debts	504	530	540	545	549	555	561	566	570	573	574
Real estate	349	367	381	390	396	401	405	409	411	413	413
Other debts	155	163	159	155	154	155	156	158	159	160	162
Debt/asset ratio	13.1%	13.2%	13.5%	13.6%	13.6%	13.6%	13.6%	13.7%	13.8%	13.9%	14.1%

All projections are averages across 500 stochastic outcomes.

Consumer price indices for food

Calendar year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
					(1982-84 = 100)						
Total food	305.4	318.7	324.3	329.8	335.9	342.8	350.4	358.3	366.1	374.0	382.1
(Inflation rate)	9.9%	4.4%	1.7%	1.7%	1.8%	2.1%	2.2%	2.2%	2.2%	2.2%	2.2%
Food at home	288.5	298.1	300.9	304.6	309.3	314.8	321.0	327.3	333.5	339.8	346.4
Cereal and bakery	326.7	344.2	344.5	347.6	353.2	360.3	368.6	376.9	385.1	393.7	402.7
Meat	313.7	315.9	319.4	324.5	330.4	336.0	342.0	348.5	354.5	360.5	367.0
Dairy	259.2	268.1	270.5	273.3	276.9	281.8	287.7	293.9	299.9	306.1	312.6
Fruit and vegetables	341.7	352.5	356.2	360.0	364.3	369.5	375.3	381.2	387.1	393.1	399.2
Other food at home	251.8	264.0	266.9	270.0	273.8	278.8	284.3	289.9	295.5	301.2	307.0
Sugar and sweets	258.8	269.3	273.9	278.0	281.3	287.5	293.6	300.1	306.8	313.3	319.7
Fats and oils	284.5	304.1	309.2	313.2	318.7	325.5	333.1	340.8	348.4	356.4	364.8
Other prepared items	267.4	280.5	282.7	285.7	290.3	295.8	302.1	308.4	314.6	321.1	327.8
Non-alcoholic beverages	201.9	211.2	214.4	216.9	219.2	222.7	226.3	230.0	233.8	237.5	241.2
Food away from home	330.8	348.6	357.4	365.2	373.0	381.7	391.1	400.8	410.5	420.3	430.4

All projections are averages across 500 stochastic outcomes.

Consumer expenditures for food

Calendar year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032
					(Dollars per person)						
Total food per capita	6,996	7,305	7,448	7,607	7,808	8,034	8,273	8,515	8,756	8,999	9,247
Food at home	3,089	3,177	3,208	3,261	3,329	3,407	3,492	3,579	3,665	3,752	3,842
Food away from home	3,907	4,127	4,240	4,345	4,479	4,626	4,781	4,936	5,090	5,246	5,406
Multiply by population for:					(Billion dollars)						
Total U.S. food expenditures	2,330	2,443	2,503	2,569	2,650	2,740	2,836	2,933	3,031	3,130	3,232

All projections are averages across 500 stochastic outcomes.