Farmland Prices in a Most Interesting Time

I ILLINOIS

Agricultural & Consumer Economics

COLLEGE OF AGRICULTURAL, CONSUMER & ENVIRONMENTAL SCIENCES



Bruce J. Sherrick, Ph.D.

Director, TIAA Center for Farmland Research Fruin Professor of Farmland Economics

Gary Schnitkey

Soybean Industry Chair in Agricultural Strategy

Luke Worrell, ALC

Worrell Land Services

Audio Problems



If you are **not hearing us**Download the **Audio Troubleshooting Guide**from the GoToWebinar Control Panel for help

Audio Troubleshooting Guide

For **farmdoc** Webinars



Housekeeping

Webinar will be archived and available on farmdoc Submit questions during the webinar Please complete the survey after the webinar



farmdoc

Farmland Prices in a Most Interesting Time

I ILLINOIS

Agricultural & Consumer Economics

COLLEGE OF AGRICULTURAL, CONSUMER & ENVIRONMENTAL SCIENCES



Bruce J. Sherrick, Ph.D.

Director, TIAA Center for Farmland Research Fruin Professor of Farmland Economics

Gary Schnitkey

Soybean Industry Chair in Agricultural Strategy

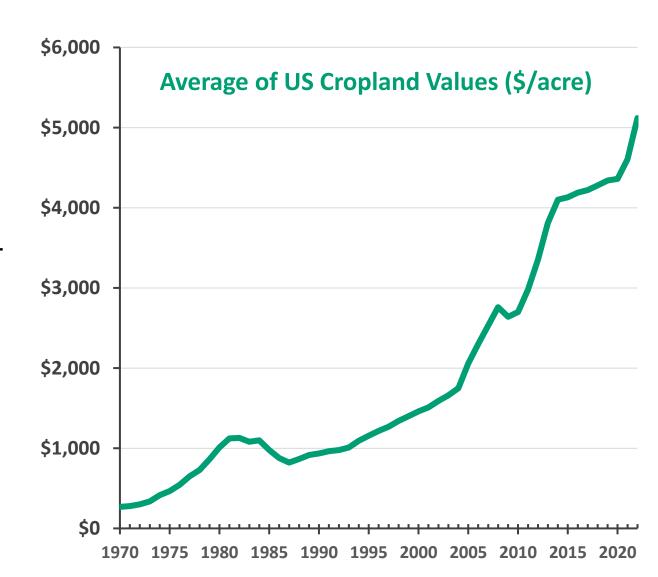
Luke Worrell, ALC

Worrell Land Services

Farmland Markets – Interesting times indeed

Purpose:

- Identify factors that led to the recent massive increases in values and rental rates.
- Interpret current and future macromarket events, and future impacts.
- Discuss what is new, what is the same, and what is still unknown in farmland markets?
- Review results of Survey of Farmland Managers



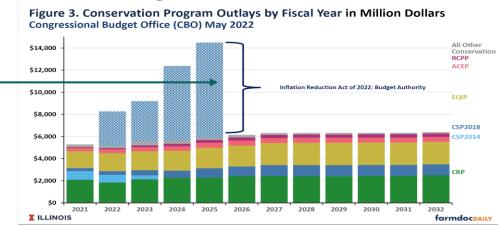
The Usual Suspects, and Some New Actors

- Commodity/Ins. Prices
- Interest rates/spreads
- Inflation now/future prospects
- International trade/conflicts
- Policy and Farm Bill focus
- Technology innovations

- Carbon/Climate/Conservation
- Consumer preferences for food attributes
- Pandemic impacts/<u>structural</u> response(?)
- Crop Insurance changes/conservation tie
- Alternative investment characteristics
- ROW Demand expansion and demographic patterns through time

Brief History of Time ...

- Increased commodity and input prices, long-term demand growth and world incomes.
 - Ex-US drivers for US asset values? How will these register?
- Massive support and fiscal stimulus payments, changing food preferences, and interest rate market interventions at unprecedented scale – "to infinity and beyond".
 - Length of continued intervention?IRA, and more election year spends



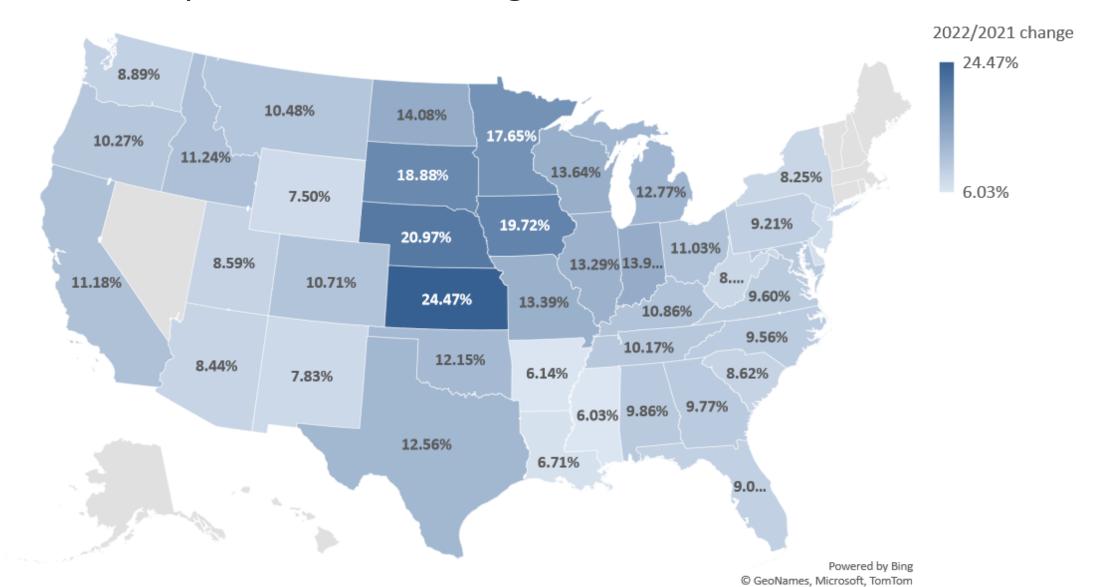


Brief History of Time ...

- Inflation in Ag input prices, and energy remain, but debate about "landing" inflation remains. Ag assets positive inflation response...
 - -Fed and ROW ability to manage growth, Central bank coordination?
- Changed (?) policy targets and priorities; low concern about spending
 - -Eco-service payments, "practice" information in downstream demand?
- Interest Rates vs. Cap Rates and "income multiple", equity markets
 - -Farmland as an asset class, institutional role, buying appreciation instead of multiples of income

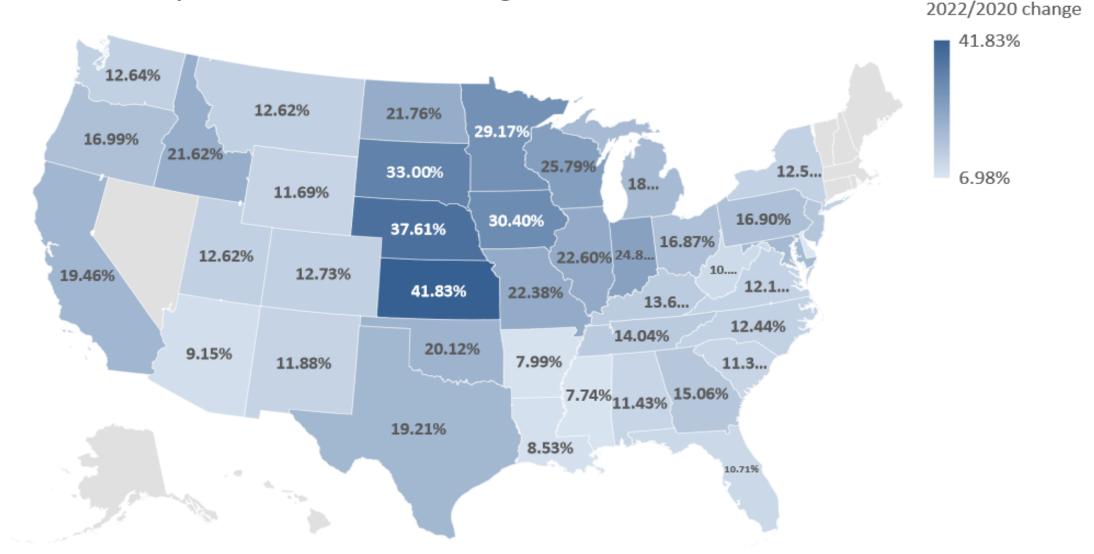
Farmland % increases (mid-year USDA estimates)

Cropland %Price Change 2021-2022



Farmland % increases (USDA 2-year estimates)

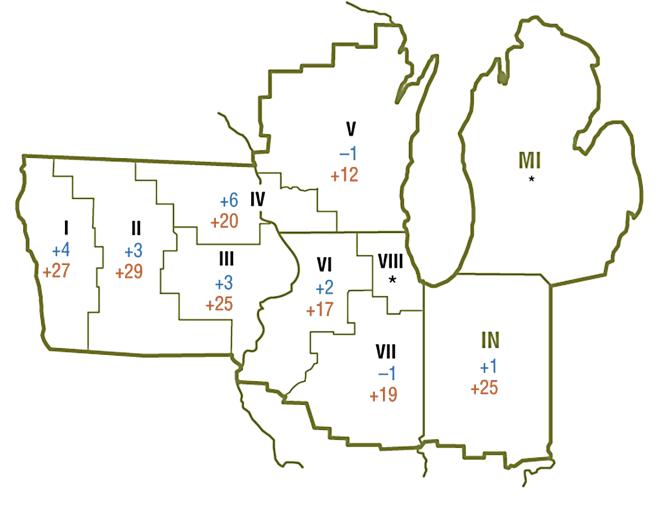
Cropland %Price Change 2020-2022



Federal Reserve Bank of Chicago, AgLetter: August 2022, David Oppedahl

Percent change in dollar value of "good" farmland

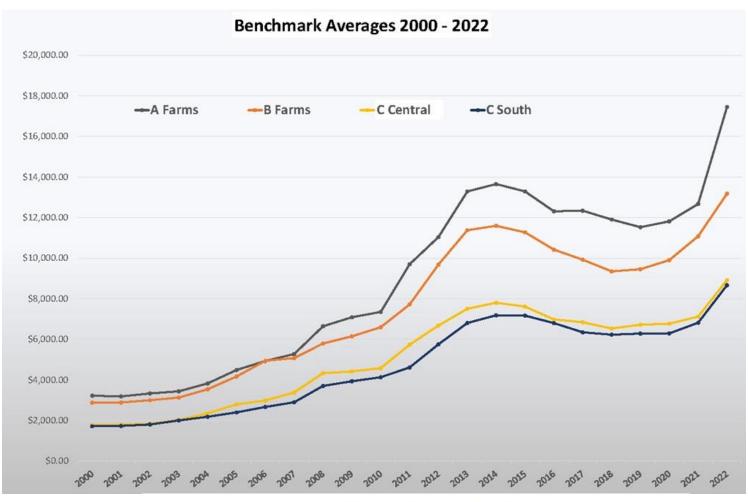
	April 1, 2022 to July 1, 2022	July 1, 2021 to July 1, 2022
Illinois	0	+18
Indiana	+1	+25
Iowa	+4	+26
Michigan	*	*
Wisconsin	-1	+13
Seventh District	+2	+22



Top: April 1, 2022 to July 1, 2022

Bottom: July 1, 2021 to July 1, 2022

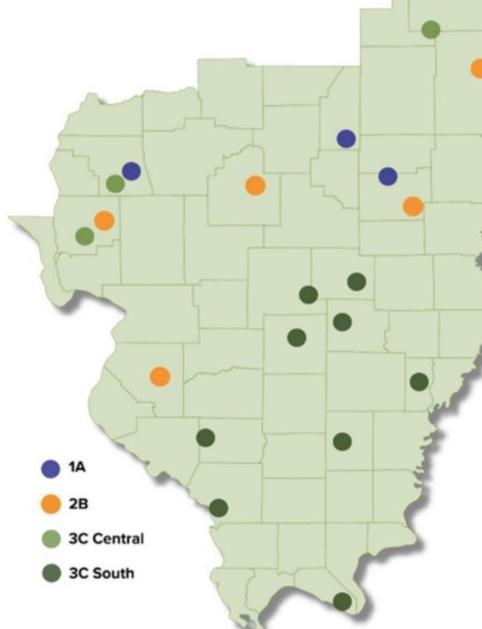
Farm Credit Illinois up 28% (August 2022)



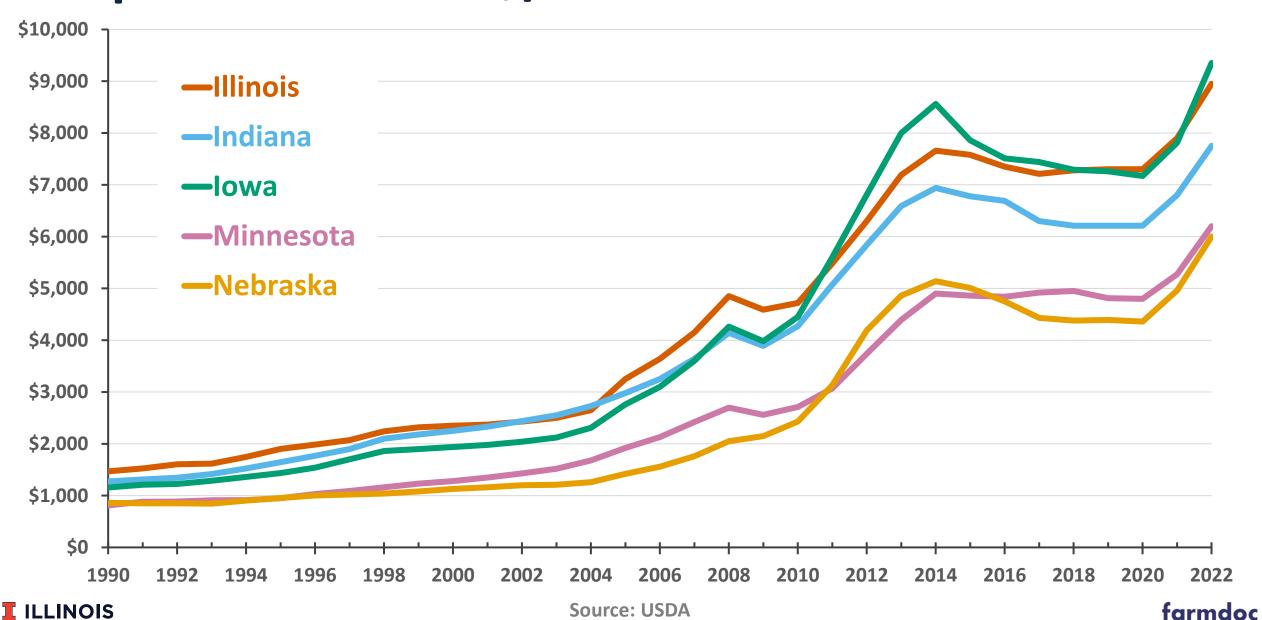




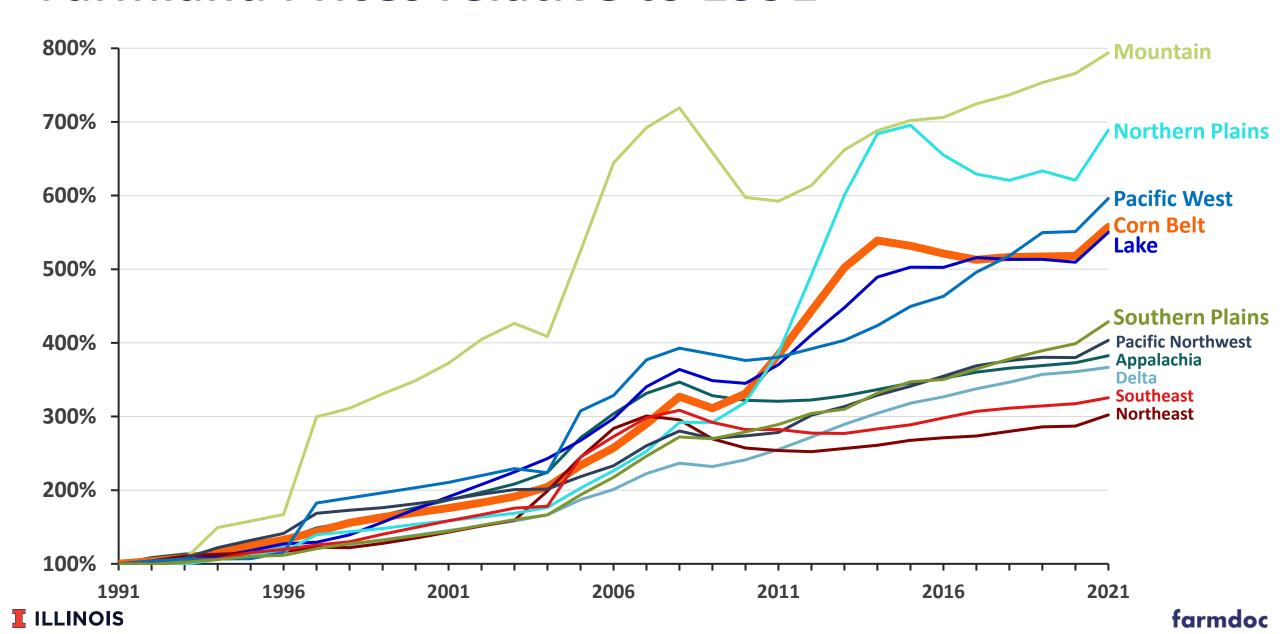




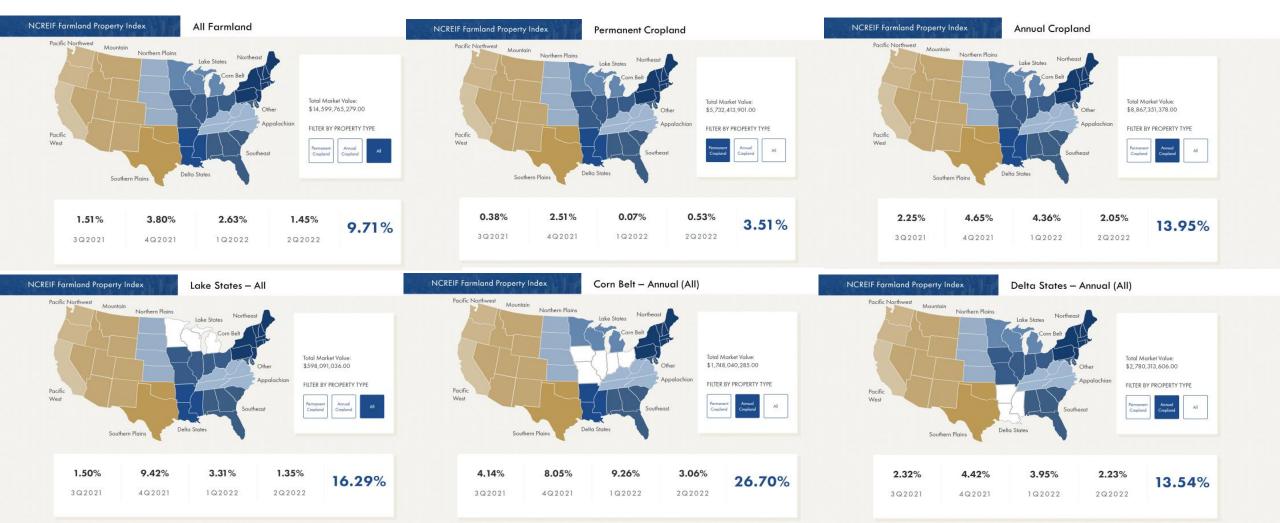
Cropland Values in \$/acre for selected states



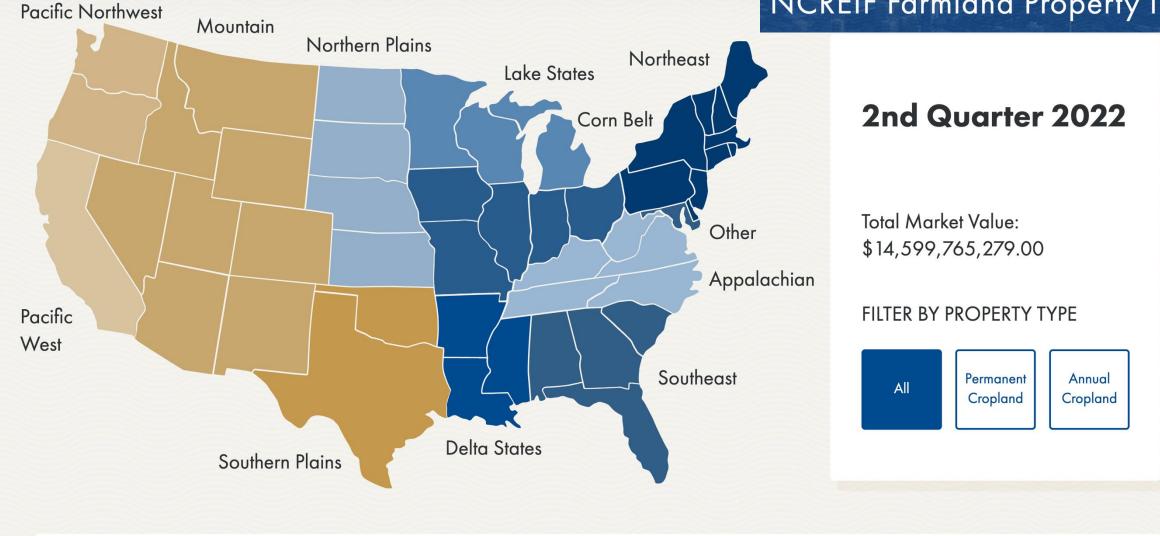
Farmland Prices relative to 1991



Farmland Returns by region (NCREIF 4Q rolling) National Council of Real Estate Investment Fiduciaries 1,300 properties, \$14.6 Billion

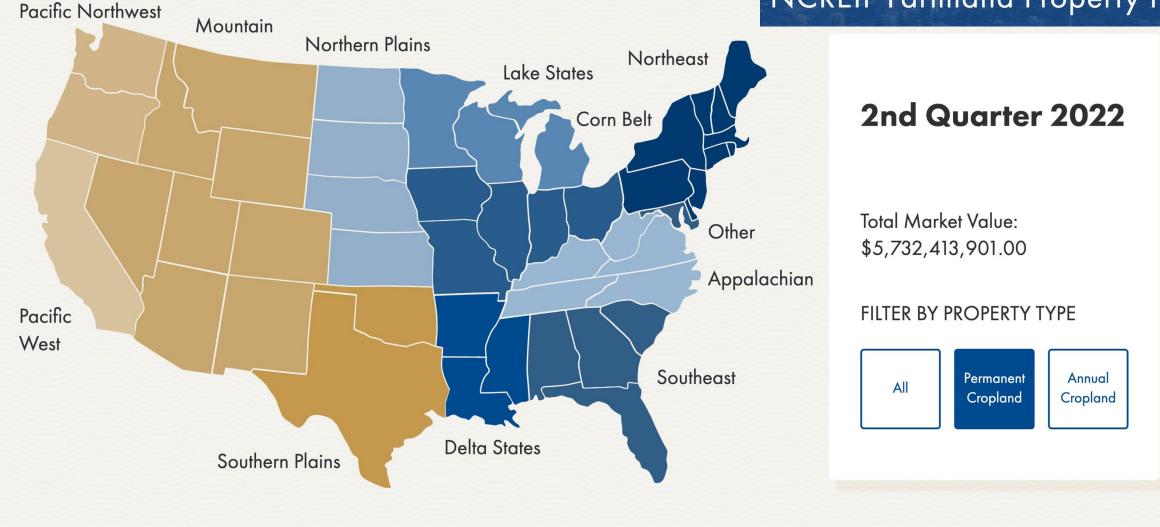


NCREIF Farmland Property Index



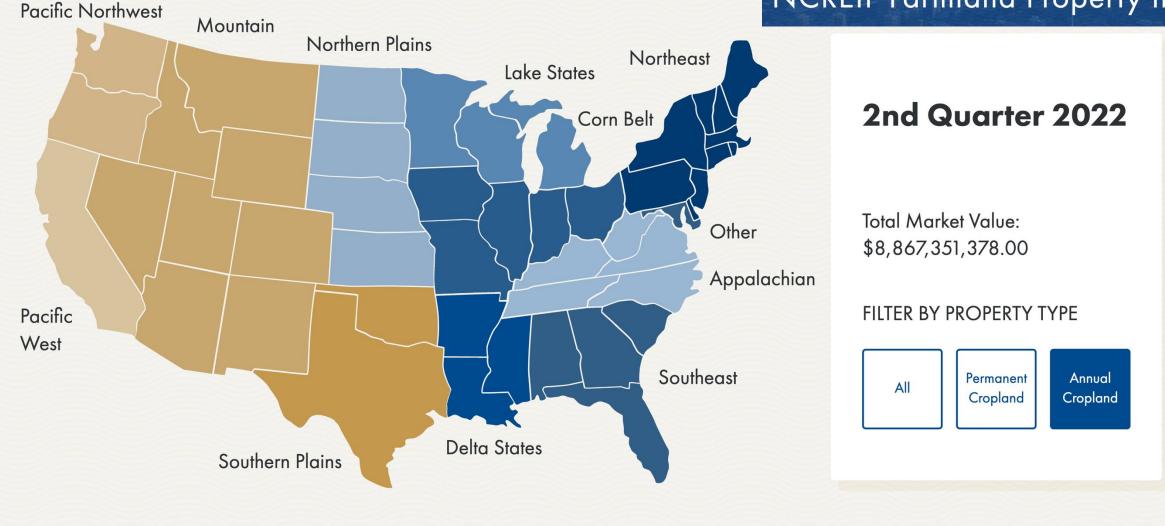
1.51%	3.80%	2.63%	1.45%	9.71%
3 Q 2 0 2 1	4Q2021	1Q2022	2Q2022	2022 ANNUAL TOTAL

NCREIF Farmland Property Index



0.38%	2.51%	0.07%	0.53%	3.51%
3 Q 2 0 2 1	4Q2021	1Q2022	2Q2022	2022 ANNUAL TOTAL

NCREIF Farmland Property Index



2.25%	4.65%	4.36%	2.05%	13.95%
3 Q 2 0 2 1	4Q2021	1Q2022	2Q2022	2022 ANNUAL TOTAL

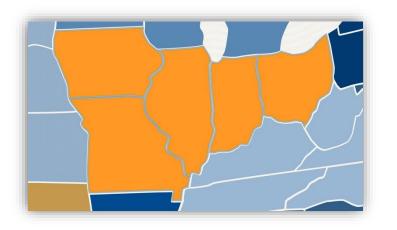




Lake States - ALL

2nd Quarter 2022 Total Market Value: \$598,091,036

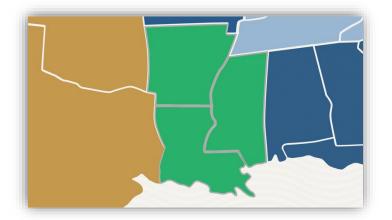
1.50%	9.42%	3.31%	1.35%	16.29%
3Q2021	4Q2021	1Q2022	2Q2022	2022 ANNUAL TOTAL



Corn Belt – Annual Cropland

2nd Quarter 2022 Total Market Value: \$1,748,040,285

4.14%	8.05%	9.26%	3.06%	26.70%
3 Q 2 O 2 1	4Q2021	1Q2022	2Q2022	2022 ANNUAL TOTAL

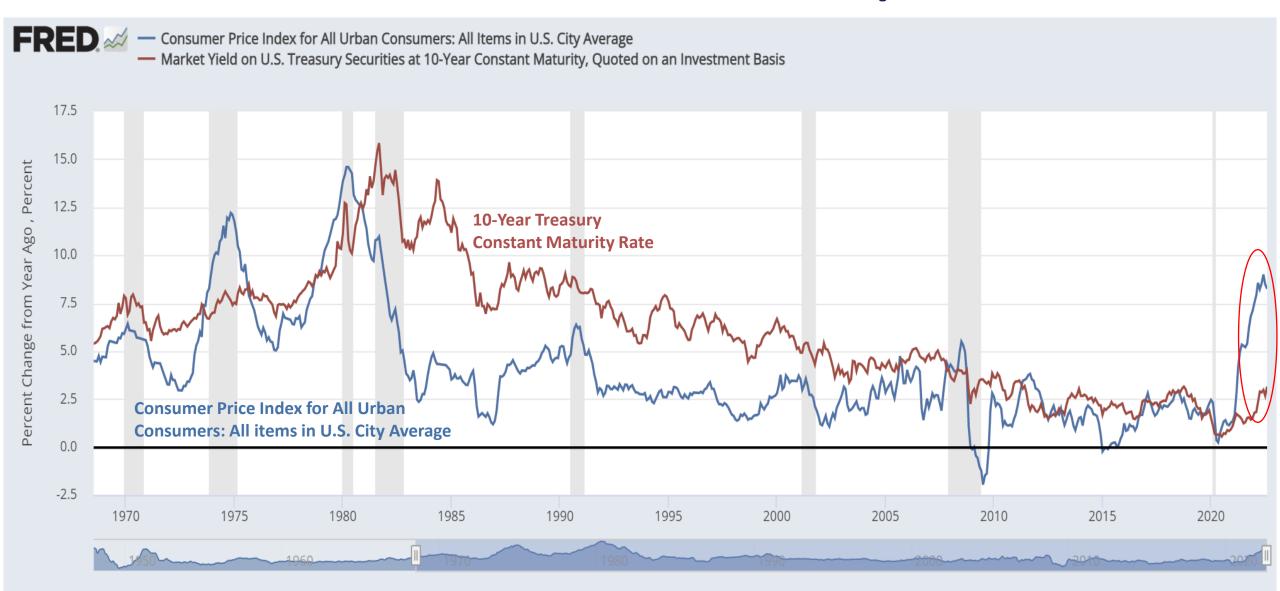


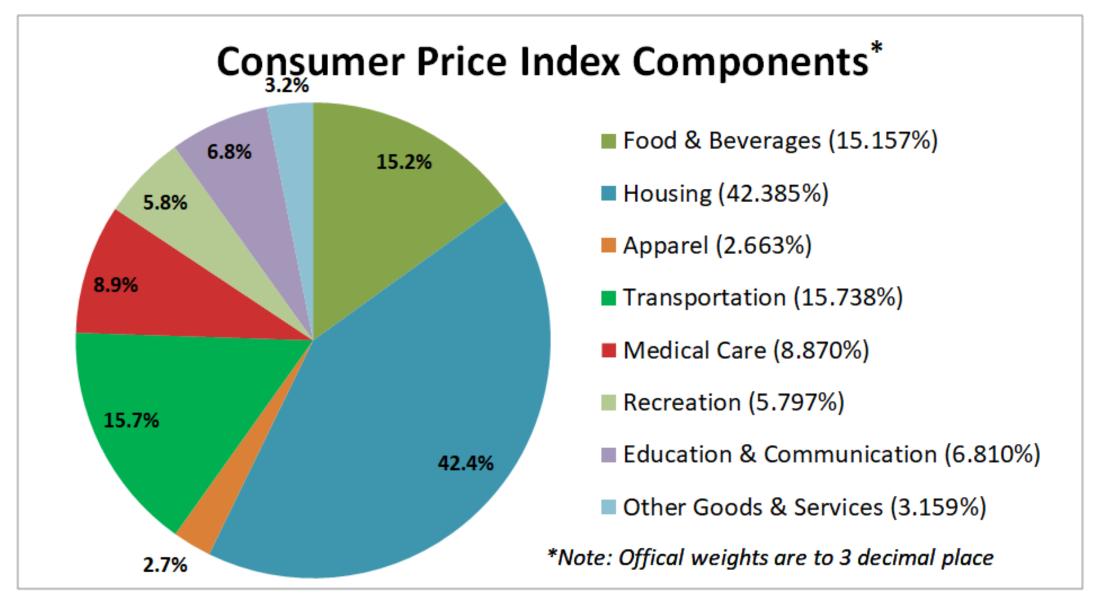
Delta States – Annual Cropland

2nd Quarter 2022 Total Market Value: \$2,780,313,606

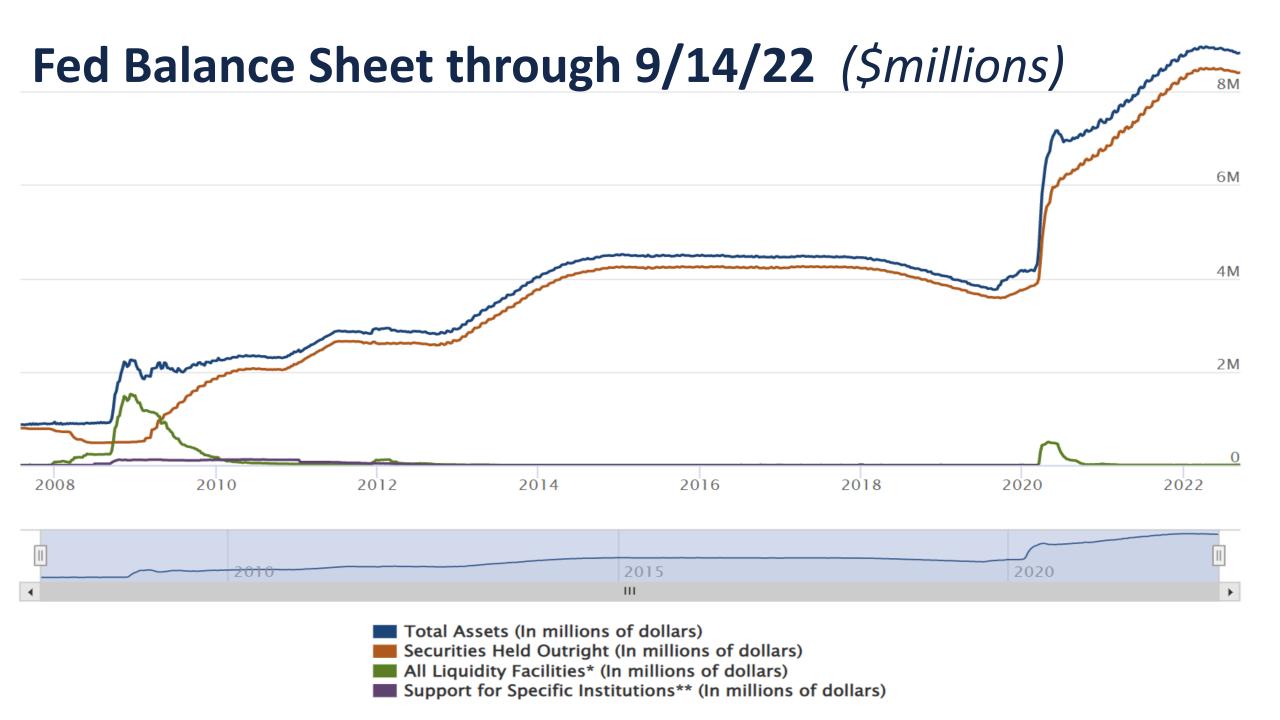
2.32%	4.42%	3.95%	2.23%	13.54%
3Q2021	4Q2021	1Q2022	2Q2022	2022 ANNUAL TOTAL

Inflation and Interest Rate Relationships (to 8/1/22...)





Source: BLS; The most recent annual reweighting was in December 2020



Do you expect inflation for the next 2 years to:

- Exceed 6% inflation/year
- Average 4-6% inflation/year
- Average 2-4% inflation/year
- Average 0-2% inflation/year
- O Be negative (experience deflation)

Corporate Sponsor



Platinum Sponsors





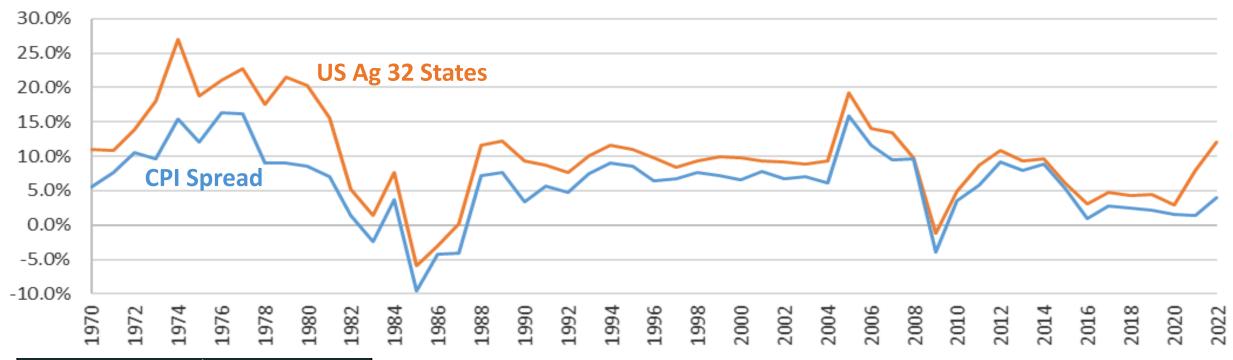








Farmland returns and farmland returns minus inflation (spread)



Decade	Farmland to CPI Spread
1970 to 1979	11.1%
1980 to 1989	1.5%
1990 to 1999	6.7%
2000 to 2009	7.7%
2010 to 2019	4.9%
1970 to 2022f	6.2%

- Farmland returns have been remarkably stable with positive alpha
- Perfect Storm in 1980s still relatively good performance
- Low volatility annual returns, appreciation positive except 1980s
- Positive Inflation effect has been incredibly reliable

Farmland Returns in Context

	Annual Ave.	Standard	Coefficient	US Ag 32 States	Minimum	Maximum		
Asset/Index	Return	Deviation	of Variation	Correlation	Return	Return		
		1990 - 2022						
US Ag 32 States	8.5%	3.6%	0.42	1.00	-1.2%	19.0%		
Illinois	9.3%	5.5%	0.59	0.80	0.8%	26.0%		
lowa	10.9%	7.3%	0.67	0.64	-5.3%	24.9%		
Indiana	9.1%	4.9%	0.54	0.64	-1.0%	22.0%		
Minnesota	10.7%	5.5%	0.51	0.78	-1.8%	20.3%		
California	8.3%	5.0%	0.60	0.55	2.5%	30.7%		
Washington	12.1%	3.6%	0.30	0.45	5.4%	24.1%		
Oregon	11.1%	4.8%	0.43	0.56	-1.6%	23.5%		
Kansas	10.1%	6.8%	0.68	0.69	-4.6%	24.4%		
		199	90 - 2021					
TCM10Y	4.30%	2.0%	0.47	0.28	0.9%	8.6%		
S&P500	8.13%	16.7%	2.06	-0.14	-48.6%	29.3%		
CompositeREITS	9.94%	18.3%	1.85	-0.13	-47.5%	33.7%		
Gold	4.72%	13.9%	2.94	0.06	-31.9%	27.7%		
PPI	2.43%	5.0%	2.07	0.14	-7.4%	20.5%		
CPI	2.48%	1.3%	0.53	0.24	0.1%	6.7%		



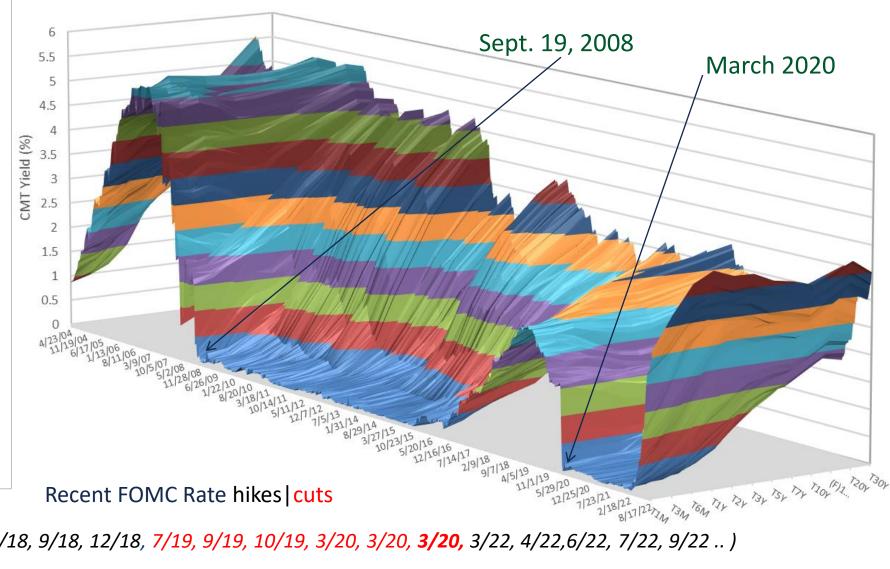
U.S. Ag Returns - correlation by rolling period intervals

Roll length	PPI	СРІ	Gold	U.S. 10-year bonds	U.S. corporate bonds	U.S. listed real estate	European equities	U.S. equities
1	65.3%	59.6%	29.9%	15.1%	9.2%	-12.7%	-22.7%	-24.7%
2	70.3%	70.0%	31.6%	16.2%	10.5%	-11.8%	-19.7%	-23.9%
3	75.7%	71.4%	38.8%	17.1%	12.1%	-11.8%	-18.6%	-27.8%
4	80.4%	72.3%	45.6%	18.6%	14.3%	-14.5%	-20.6%	-35.5%
5	84.0%	72.9%	52.3%	20.9%	17.1%	-15.4%	-21.9%	-41.1%
6	86.2%	72.6%	57.5%	23.5%	20.2%	-13.8%	-21.1%	-46.9%
7	87.4%	72.1%	60.3%	26.3%	23.6%	-15.5%	-20.3%	-52.2%
8	86.9%	71.6%	60.1%	29.5%	27.4%	-17.4%	-18.7%	-55.2%
9	86.7%	71.1%	57.7%	33.0%	32.1%	-13.1%	-21.3%	-54.3%
10	86.3%	70.6%	54.9%	37.1%	36.6%	-8.8%	-21.7%	-52.5%

Yield Curve 2003 – August 2022 (weekly)

- Credit easing events since 2008, and start of pandemic
- Natural Multiple expansion/contractions
- Massive stimulus on top is a somewhat different effect
- Fed Purchases from Treas. to manage interest rates
- Forward Inflation forecasts seem to drive Fed + hope
- B/S debate settling on slow reduction

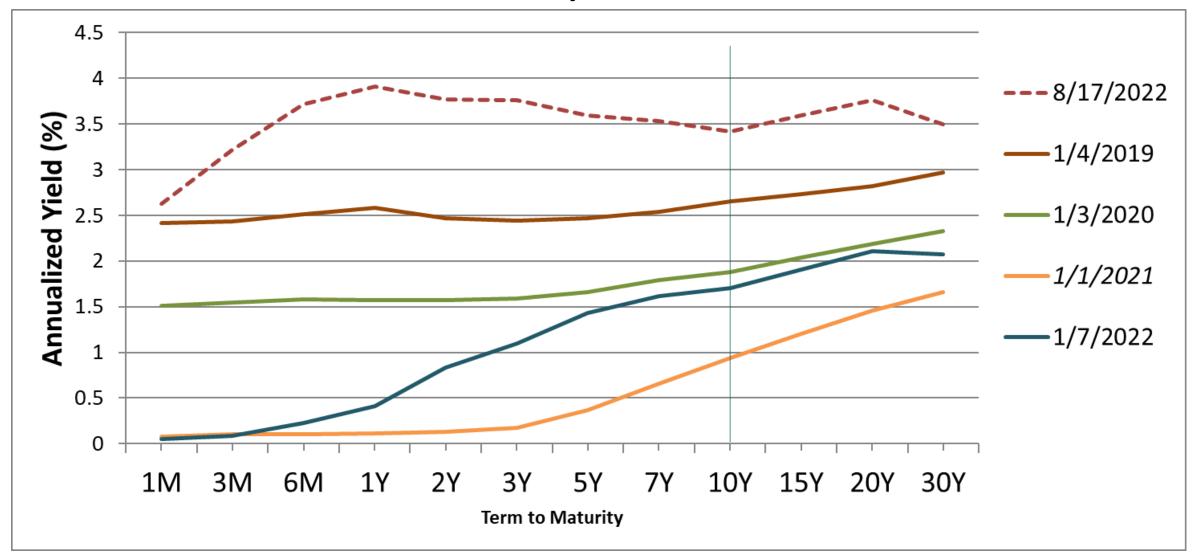
IMPACT ON REAL ESTATE?



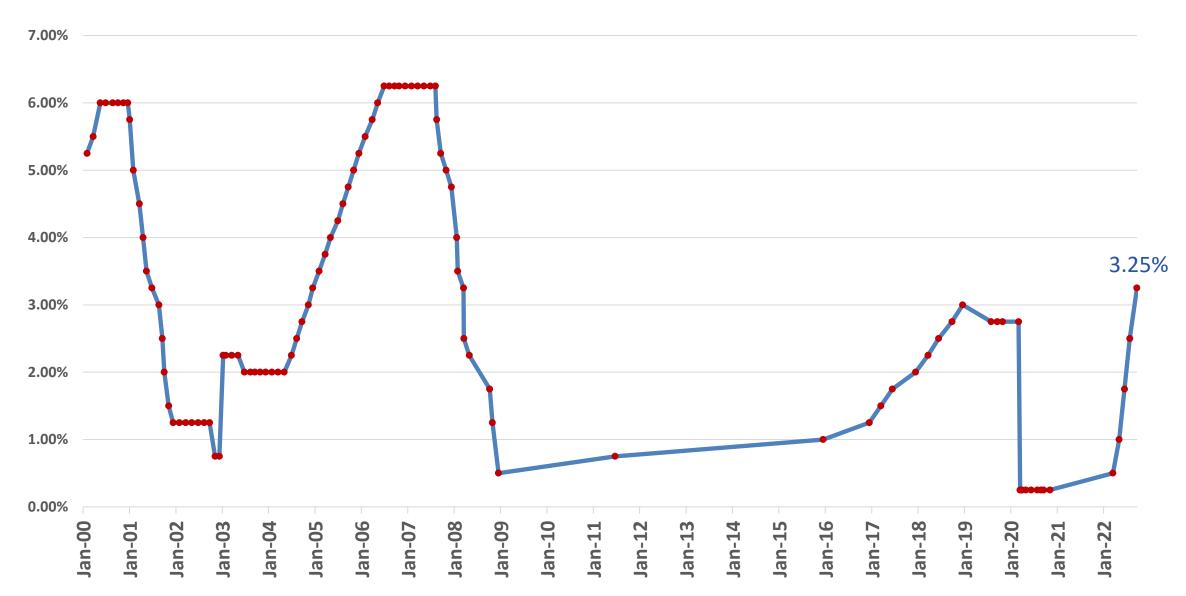
(12/15, 12/16, 3/17, 6/17, 12/17, 3/18, 6/18, 9/18, 12/18, <mark>7/19, 9/19, 10/19, 3/20, 3/20, 3/20, 3/20,</mark> 3/22, 4/22,6/22, 7/22, 9/22...)

Expected future rates, and the discount rate for Ag

US Treasury Yield Curves



Fed discount rate and vote patterns (to 9/21/22)



What will interest rates on long term fixed rate farm mortgage loans be in one year:

- **Over 7%**
- **6-7%**
- **5-6%**
- **4-5%**
- O Under 4%

Corporate Sponsor



Platinum Sponsors













Balance Sheet of Ag Sector -- US

Table 1. Selected Balance Sheet Characteristics of US Agricultural Sector

	1970	1980	1990	2000	2010	2017	2019	2021
	(\$ millions	, except ratios	s - source E	RS-USDA)				
Farm Assets	278,823	1,000,422	840,609	1,203,215	2,170,832	3,005,945	3,075,156	3,263,517
Real Estate	202,418	782,820	619,149	946,428	1,660,114	2,469,495	2,545,996	2,693,380
Non Real Estate	76,405	217,602	221,459	256,787	510,718	536,450	529,160	570,137
Farm Debt	48,501	162,432	131,116	163,930	278,931	390,425	419,691	454,111
Real Estate	27,238	85,272	67,633	84,724	154,065	236,243	267,937	301,705
Non Real Estate	21,263	77,160	63,483	79,206	124,865	154,182	151,754	152,405
Equity	230,322	837,990	709,493	1,039,285	1,891,902	2,615,520	2,655,465	2,809,406
Selected Indicators								
Debt/Equity	21.1%	19.4%	18.5%	15.8%	14.7%	15.0%	15.8%	16.2%
Debt/Assets	17.4%	16.2%	15.6%	13.6%	12.8%	13.0%	13.6%	13.9%
Real Estate/Equity	87.9%	93.4%	87.3%	91.1%	87.7%	95.0%	96.0%	95.9%
Real Estate/Assets	72.6%	78.2%	73.7%	78.7%	76.5%	82.2%	82.8%	82.5%
Real Estate D/Tota	56.2%	52.5%	51.6%	51.7%	55.2%	60.5%	63.8%	66.4%



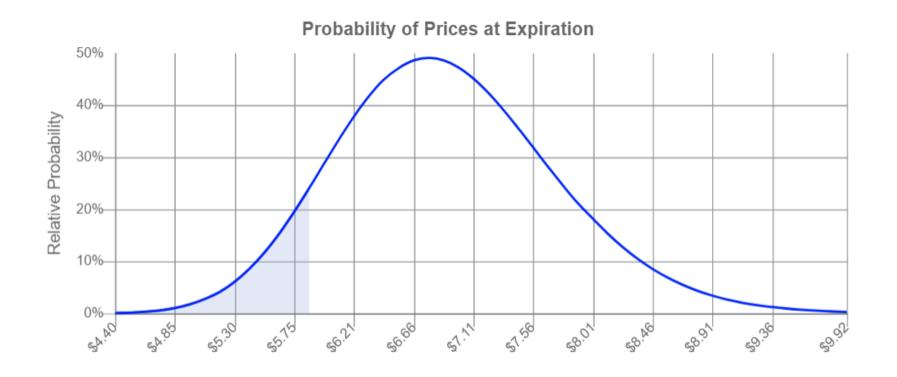
Where do prices register? Depends on crop insurance...

Trojected Friees, ridivest Friees, drid volutilies, corri drid soybedris, seb s/ 15 (mixin)	Projected Prices	, Harvest Prices, and	d Volatilies, Corn and So	ybeans, SCD 3/15 ((RMA)
---	-------------------------	-----------------------	---------------------------	--------------------	-------

Corn	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Proj Price	6.01	5.68	5.65	4.62	4.15	3.86	3.96	3.96	4.00	3.88	4.58	5.90
Harvest Price	6.32	7.50	4.39	3.49	3.83	3.49	3.49	3.68	3.90	3.99	5.37	
Volatility	0.29	0.22	0.20	0.19	0.21	0.17	0.19	0.15	0.15	0.15	0.23	0.23
Soybeans												
Proj Price	13.49	12.55	12.87	11.36	9.73	8.85	10.19	10.16	9.54	9.17	11.87	14.23
Harvest Price	12.14	15.39	12.87	9.65	8.91	9.75	9.75	8.60	9.25	10.55	12.30	
Volatility	0.23	0.18	0.17	0.13	0.16	0.12	0.16	0.14	0.12	0.12	0.19	0.19

- Forward Market Prices maintaining reasonable levels, insurance forwards similar.
- Input expenses (especially fertilizer and energy) dramatically higher, but slowing
- Demand Expansion thesis for Rest of World (ROW) positive but uncertain
- Export demand growth also dependent on strength of the dollar

Market's expected Dec 2022 Corn Prices (as of 9/20/22)



Probability Below	Price at Expiration
5%	\$5.64
15%	\$6.06
25%	\$6.33
35%	\$6.55
45%	\$6.76
50%	\$6.86
55%	\$6.97
65%	\$7.18
75%	\$7.44
85%	\$7.77
95%	\$8.35

Enter Price to Evaluate: \$ 5.90

The implied distribution indicates that there is a 10.26% probability that the price will be below \$5.90 at expiration.

I ILLINOIS

Market's expected Nov 2022 Soybean Prices (as of 9/20/22)



Probability Below	Price at Expiration
5%	\$13.10
15%	\$13.68
25%	\$14.04
35%	\$14.34
45%	\$14.61
50%	\$14.74
55%	\$14.88
65%	\$15.16
75%	\$15.48
85%	\$15.88
95%	\$16.60

Enter Price to Evaluate: \$ 14.23

The implied distribution indicates that there is a 31.14% probability that the price will be below \$14.23 at expiration.

Accessed on September 20, 2022, 09:27 PM.

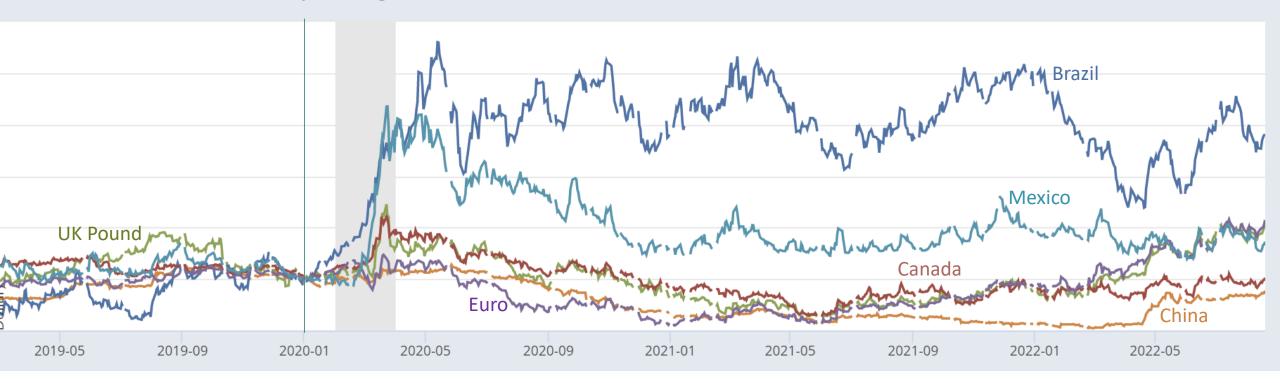




What About the Strength of the Dollar?..."well, it's still complicated...."

- (Brazilian Reals to U.S. Dollar Spot Exchange Rate), 2020-01-06=100
- (Canadian Dollars to U.S. Dollar Spot Exchange Rate), 2020-01-06=100
- (1/U.S. Dollars to U.K. Pound Sterling Spot Exchange Rate), 2020-01-06=100
- (1/U.S. Dollars to Euro Spot Exchange Rate), 2020-01-06=100
- (Mexican Pesos to U.S. Dollar Spot Exchange Rate), 2020-01-06=100
- (Chinese Yuan Renminbi to U.S. Dollar Spot Exchange Rate), 2020-01-06=100

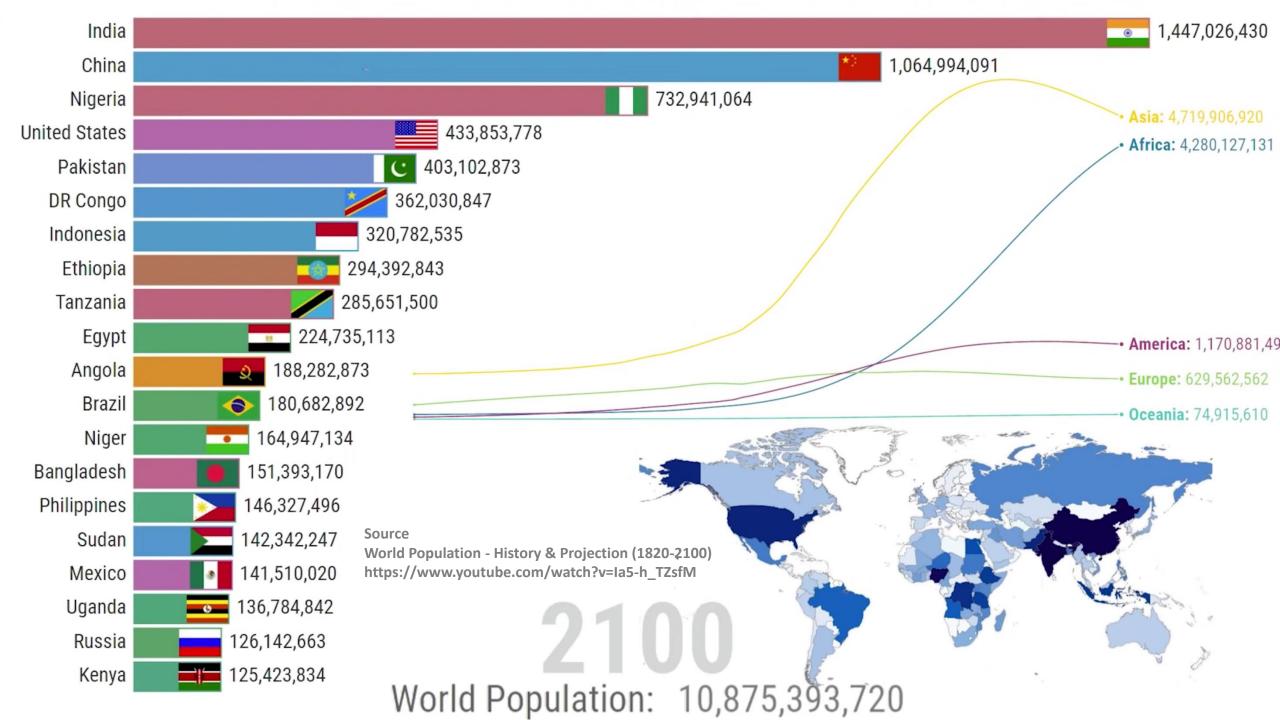
- 1/6/2020 = 100
- Strength of trading relationship important
- Balance of trade ag is rare category: exports > imports





Key policy issues impacting Ag assets

- Inflation or stagflation? Term structure resolution and productivity growth interaction (note: US productivity has not returned)
 - FOMC stance becoming forced, world markets coordinated/integrated
 - Fed Balance sheet vs. stock market problem still matters....
- Ag Policy impacts and changing emphasis of US Federal policy
 - Untethered spending in non-traditional titles and direct interventions
 - "Climate" as proxy for payment linkages in ag yet to be resolved
- Demand for commodities in ROW increasing, strength of dollar and trade conflicts dampen effect. Massive caloric expansion will occur.

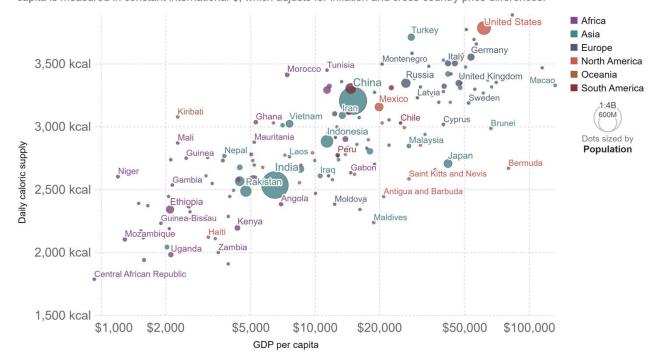


As income improves, life expectancy goes up
As income improves, demand for calories goes up
As income improves, quality of diet goes up
As income improves, % of income on food declines

ROW standard of living remains key driver

Daily per capita supply of calories vs. GDP per capita, 2018

Daily per capita supply of calories is measured in kilocalories per person per day. Gross domestic product (GDP) per capita is measured in constant international-\$, which adjusts for inflation and cross-country price differences.



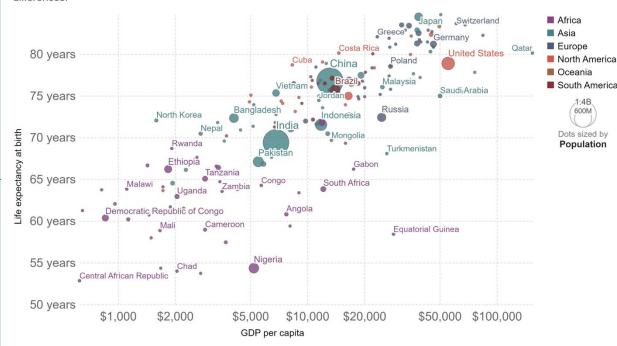
Source: Food and Agriculture Organization of the United Nations and various historical sources; World Bank OurWorldInData.org/food-supply • CC BY

Life expectancy vs. GDP per capita, 2018

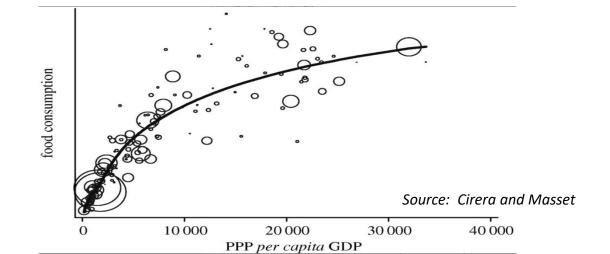
Our World in Data



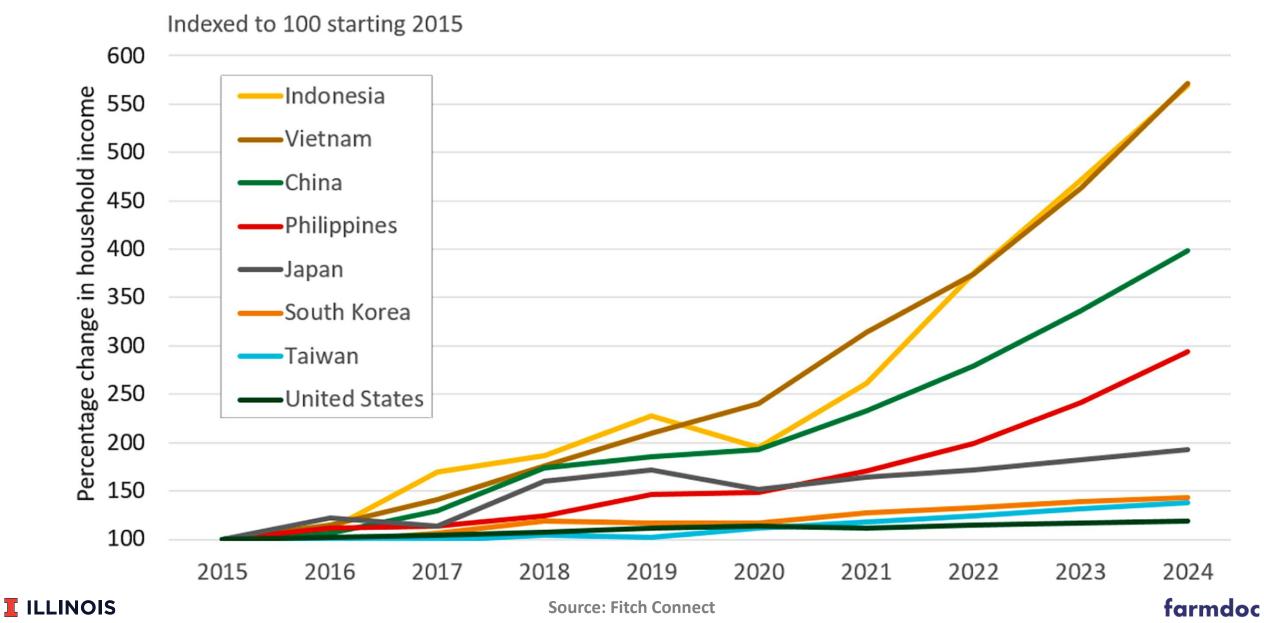
GDP per capita is measured in 2011 international dollars, which corrects for inflation and cross-country price differences.

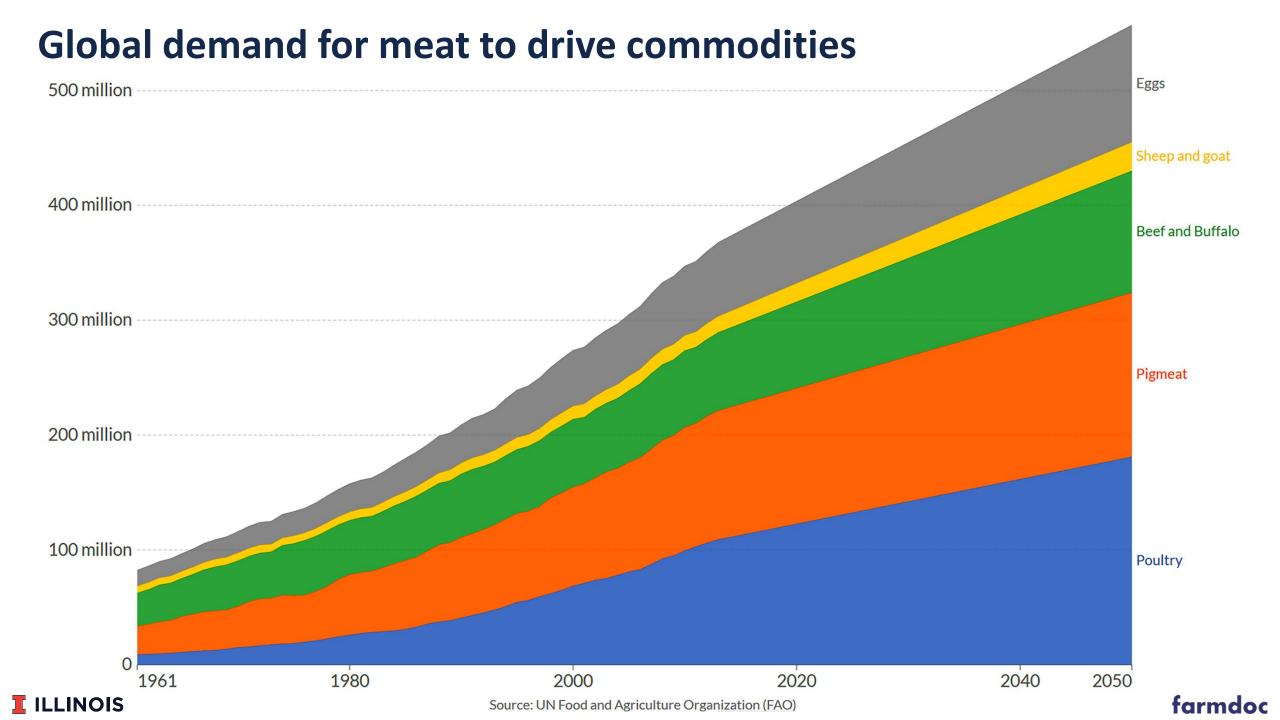


Source: Clio-Infra & UN Population Division, Maddison Project Database 2020 (Bolt and van Zanden (2020)) OurWorldInData.org/life-expectancy • CC BY



Growth in household income (US \$35,000+)





Other key issues impacting farmland

- Water issues likely to create pressures in other areas for production shifts – declining aquifers and changing regulation
- Ethanol demand and use of corn in energy markets – EV impacts?
 Biodiesel and use of soybeans in energy markets





Other key issues impacting farmland

- Farm Bill Titles and use of federal programs for new agendas
 - Ag increasingly part of climate and carbon conversations
 - Developing markets for payments vs. regulatory overhead
 - "Carbon farming" issues far from settled, but only industry with enough capacity to make material change as the plant is still the main solar collector and the meaningful store of CO₂
 - Crop Insurance, changing technologies, and "practices" that overlap programs. Crop Insurance remains primary risk program.

Key issues impacting farmland

- Financialization ("we've been 2 years away for the last 10")
 - Public vehicles (REITs, ETFs, Adjacency funds)
 - De-Fi vehicles (mAgma, AcreTrader, FarmTogether, Steward, etc)
 - Institutional investors, large HNW positions, role in scale expansion
 - Rationalization of debt within asset class did not occur while rates were low, lending reactions often rear-view mirrored.
 - Credit spreads in ag did not expand like commercial credit
 - Historic loss rates incredibly low
 - Capital in FCS and in community banks still exceptionally high

Do you expect farmland values in 5 years to be:

- More than 25% higher (increase more than 5% per year)
- 10-25% higher in total (increase 2-5% per year)
- 0-10% higher in total (increase 0-2% per year)
- Decline by 0-5% (decrease 0-1% per year)
- O Decline by more 5% (decrease more than 1% per year)

Corporate Sponsor



Platinum Sponsors













Expectations for 2022-3 Farmland Prices



Illinois Society of Professional Farm Managers and Rural Appraisers

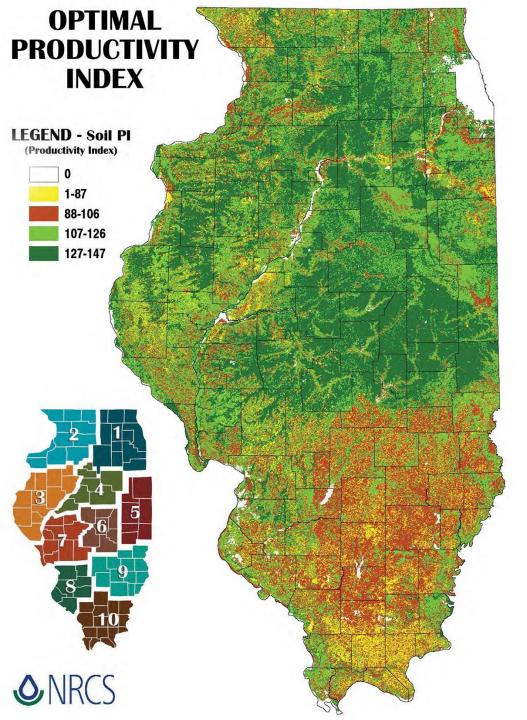
The ISPFMRA is an organization of professional men and women engaged in the management of farms and the appraisal of rural property. The Society was founded in 1928 and has grown to a membership of over 350 active members and "friends."



Illinois **Society of Professional** Farm Managers and Rural **Appraisers** farmdoc

ISPFMRA.org





Illinois Farmland Values & Lease Trends

Understanding Our Farmland Categories

Using the Productivity Index from the University of Illinois (Bulletin 811)

Excellent Productivity 147 to 133

Good Productivity 132 to 117

Average Productivity 116 to 100

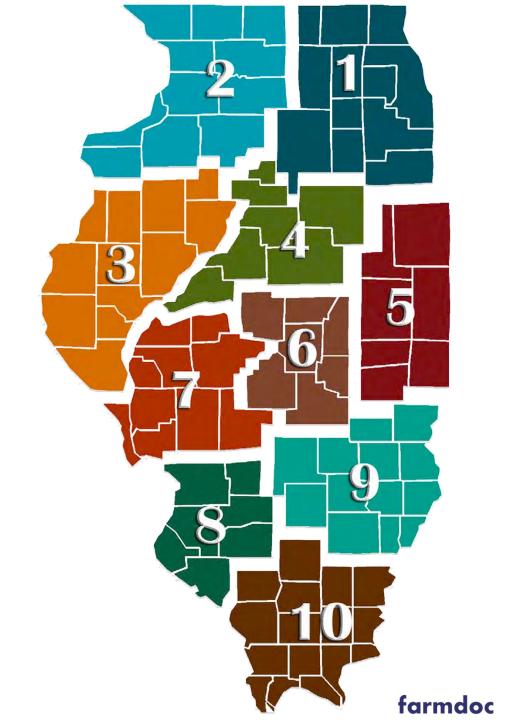
Fair Productivity Less than 100

Recreational Tracts

Transitional Tracts

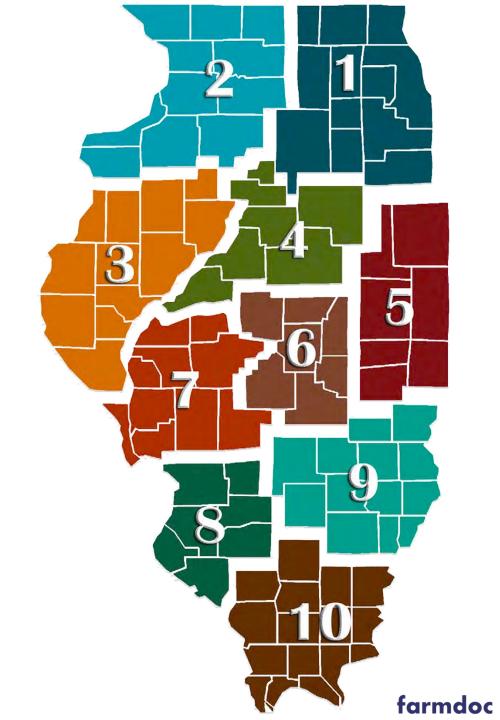
Excellent Quality Farmland

	Farmland Price Jan 1, 2022	Mid-Year % change
Region 1	\$12,000	+16%
Region 2	\$13,000	+21%
Region 3	\$14,056	+18%
Region 4	\$14,550	+11%
Region 5	\$12,998	+17%
Region 6	\$14,000	+20%
Region 7	\$14,200	+15%
Region 8		
Region 9		
Region 10		
All Regions	\$13,543	



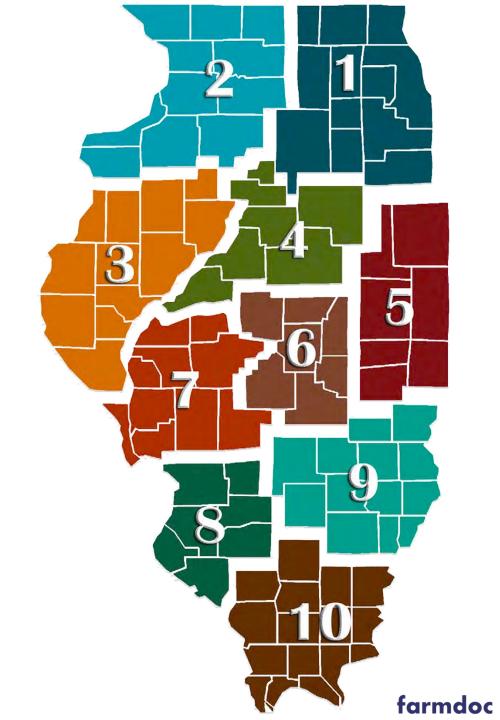
Good Quality Farmland

	Farmland Price Jan 1, 2022	Mid-Year % change
Region 1	\$8,725	+15%
Region 2	\$10,000	+22%
Region 3	\$8,550	+33%
Region 4	\$12,100	+8%
Region 5	\$10,512	+15%
Region 6	\$11,000	+28%
Region 7	\$10,000	+17%
Region 8	\$11,325	+19%
Region 9	\$9,050	
Region 10	\$10,000	
All Regions	\$10,126	



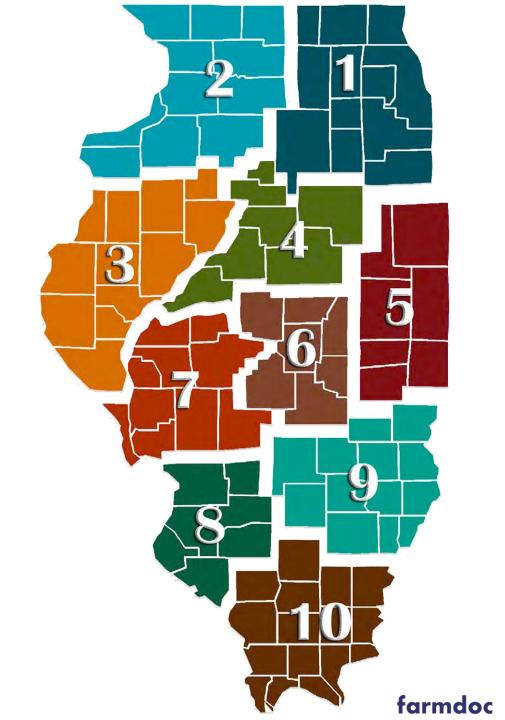
Average Quality Farmland

	Farmland Price Jan 1, 2022	Mid-Year % change
Region 1	\$6,055	+22%
Region 2	\$7,284	+25%
Region 3	\$6,125	+29%
Region 4	\$7,625	+13%
Region 5	\$7,125	+22%
Region 6	\$7,748	+32%
Region 7	\$6,600	+19%
Region 8	\$9.756	+17%
Region 9	\$7,296	
Region 10	\$5,860	
All Regions	\$7,147	

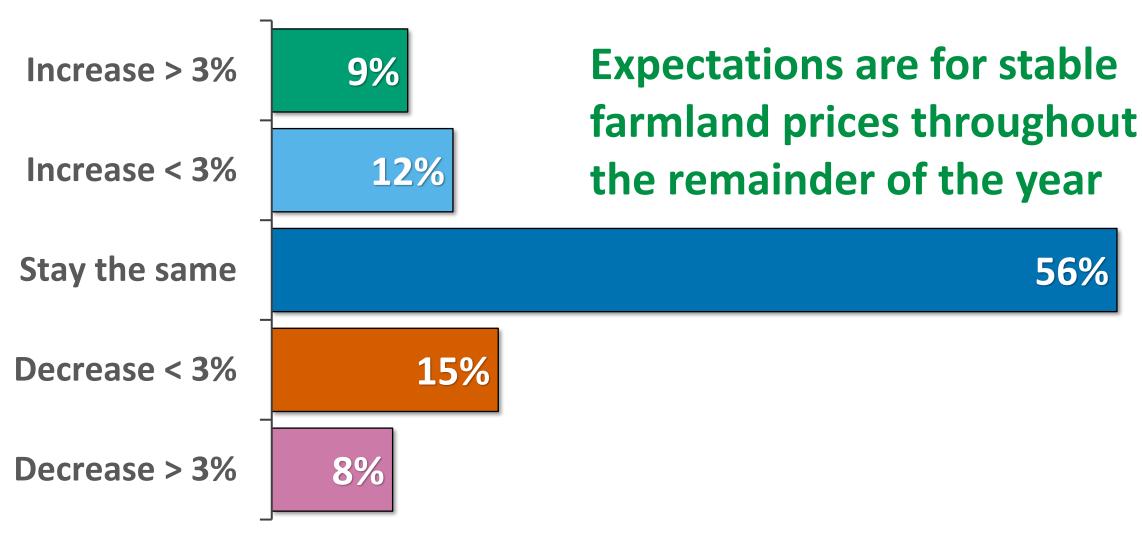


Fair Quality Farmland

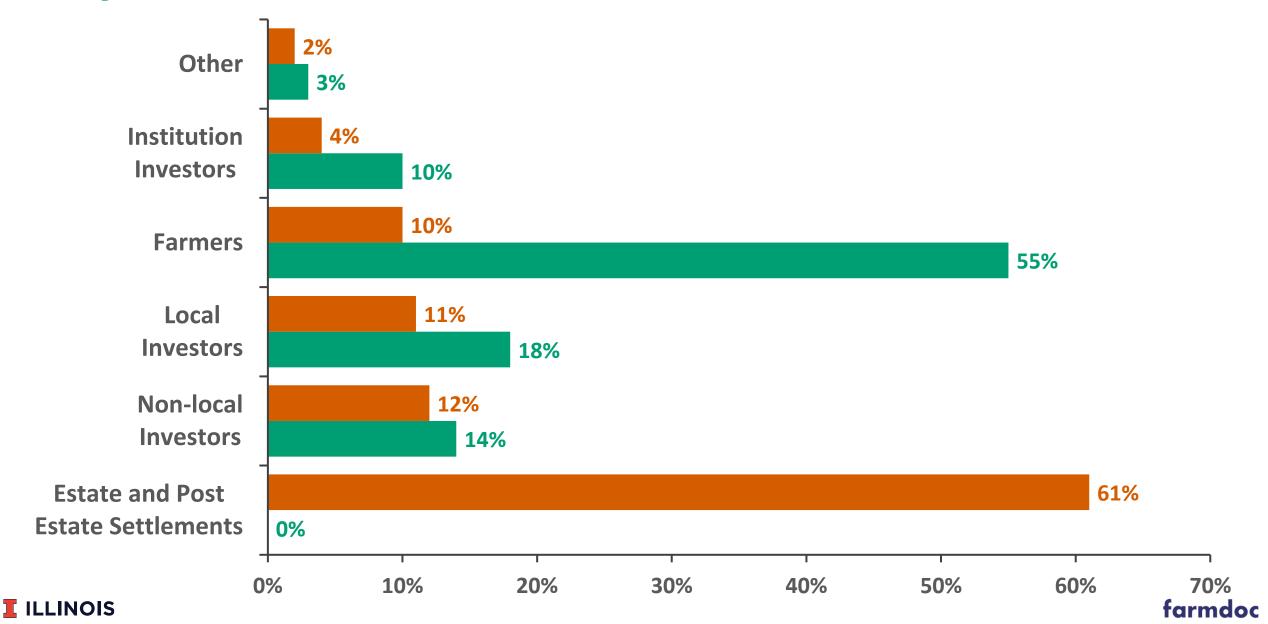
	Farmland Price Jan 1, 2022	Mid-Year % change
Region 1		
Region 2	\$4,923	+17%
Region 3	\$4,800	
Region 4		
Region 5		
Region 6	\$7,775	+15%
Region 7		
Region 8	\$7,250	+17%
Region 9	\$5,350	
Region 10	\$4,210	
All Regions	\$6,926	



Expectations of Farmland Prices in Remainder of the Year



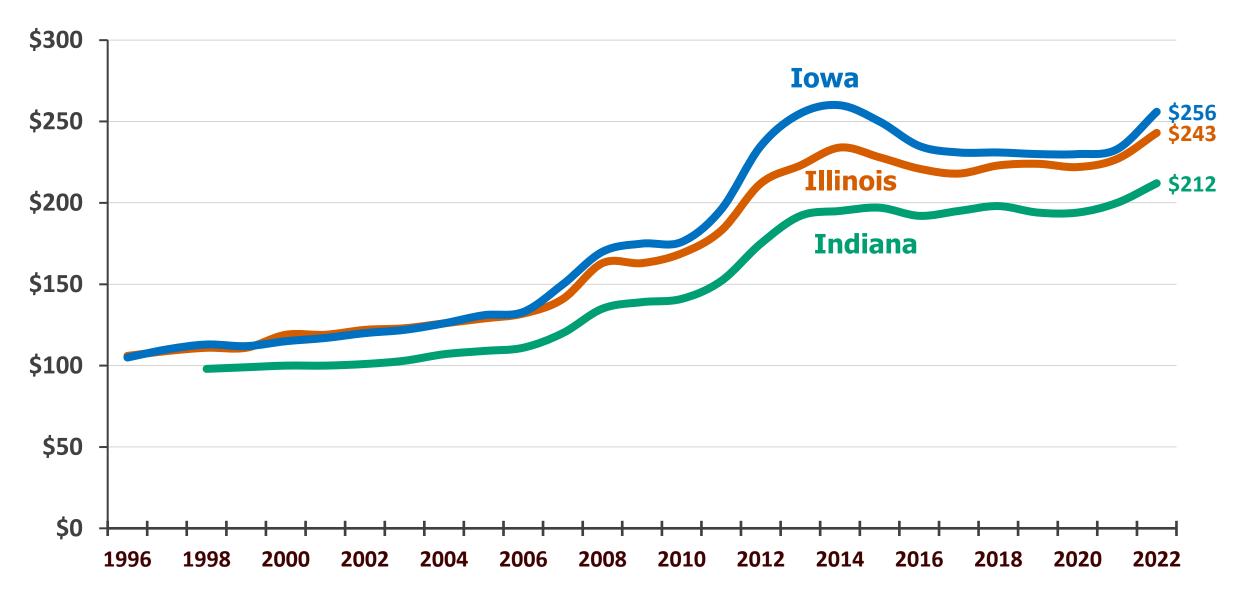
Buyers and Sellers of Farmland



Expectations for 2023 Cash Rents



Average Cash Rents in Illinois, Indiana, and Iowa





Source: National Agricultural Statistical Service

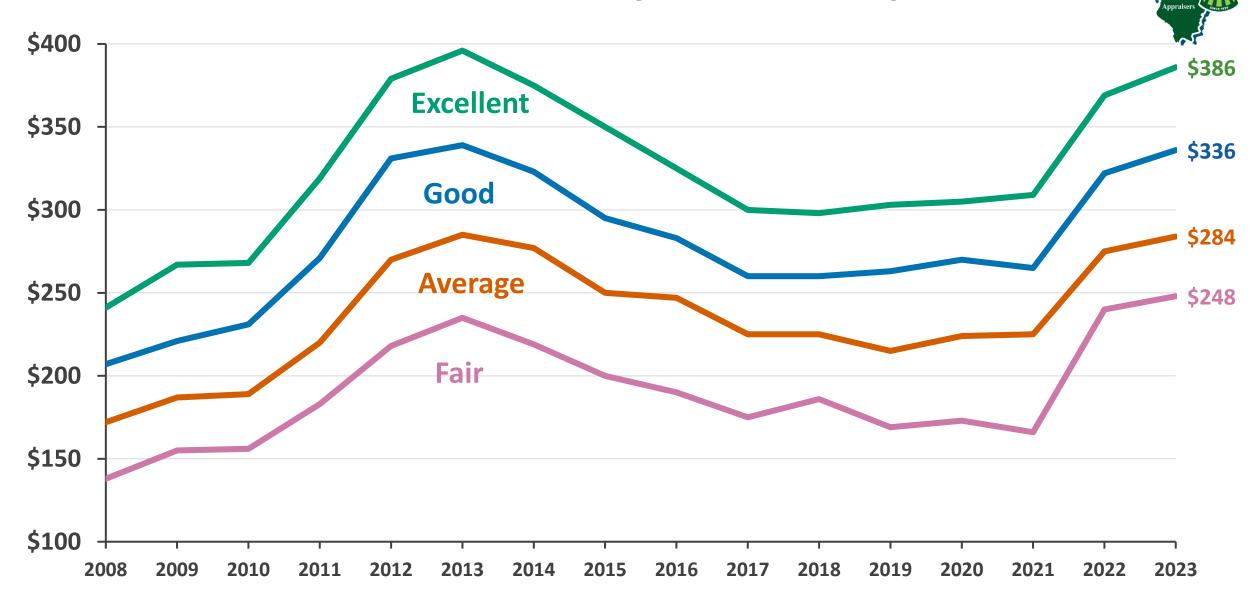
Trends on Professionally Managed Farmland

Cash Rents of Survey in \$ per acre



	Land Quality			
Year	Excellent	Good	Average	Fair
2007	\$183	\$164	\$144	\$120
2008	\$241	\$207	\$172	\$138
2009	\$267	\$221	\$187	\$155
2010	\$268	\$231	\$189	\$156
2011	\$319	\$271	\$220	\$183
2012	\$379	\$331	\$270	\$218
2013	\$396	\$339	\$285	\$235
2014	\$375	\$323	\$277	\$219
2015	\$350	\$295	\$250	\$200
2016	\$325	\$283	\$247	\$190
2017	\$300	\$260	\$225	\$175
2018	\$298	\$260	\$225	\$186
2019	\$303	\$263	\$215	\$169
2020	\$305	\$270	\$224	\$173
2021	\$309	\$265	\$225	\$166
2022	\$369	\$322	\$275	\$240

Historic Cash Rents of Survey in Dollars per Acre



Society of

Farm Managers

Expectations for 2023

Expected Soybean Price

\$13.20

Expected

Corn Price

\$5.60

Increases in interest rates

Professionally managed farmland

40%

of farm mangers
have an
arrangement with a
wind company

38%

have an arrangement with a solar company

33%

expect an increase in wheat acres (southern part of the state)

33%

indicate more interest in organic farming

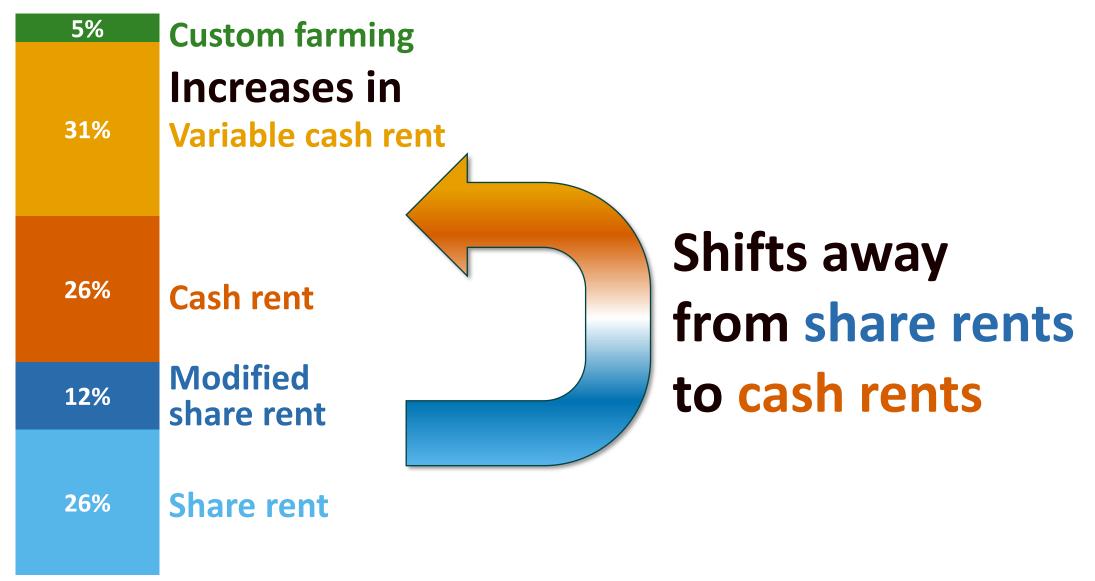








Leasing arrangements used by farm managers



Variable lease arrangements

- 85% have a base cash rent
- 75% have a payment when revenue exceeds a specified level
- Price used in revenue
 - 52% use multiple prices at a local delivery point
 - **-** 38% use future prices
 - 5% use actual marketing
- Yield used in revenue
 - 90% use farm yield, others use county yield

Mid Year Survey Results

- During the first half of 2022, **farmland prices rose by 18%**. The strong market during the first half of 2022 continues the increasing market from 2021. Survey participants do not expect as large an increase in the second half of 2022.
- Cash rents in 2023 are expected to increase by \$17 per acre on excellent productivity farmland. Lower productivity farmland is projected to have lower increases, with fair productivity having an \$8 per acre projected increase.
- Survey participants expect prices for the 2023 crop to average \$5.60 per bushel for corn and \$13.20 per bushel for soybeans. These prices are a continuation of the strong commodity prices seen since the beginning of 2021.



Agricultural & Consumer Economics

COLLEGE OF AGRICULTURAL, CONSUMER & ENVIRONMENTAL SCIENCES



Extension

COLLEGE OF AGRICULTURAL, CONSUMER & ENVIRONMENTAL SCIENCES



TIAA Center for Farmland Research







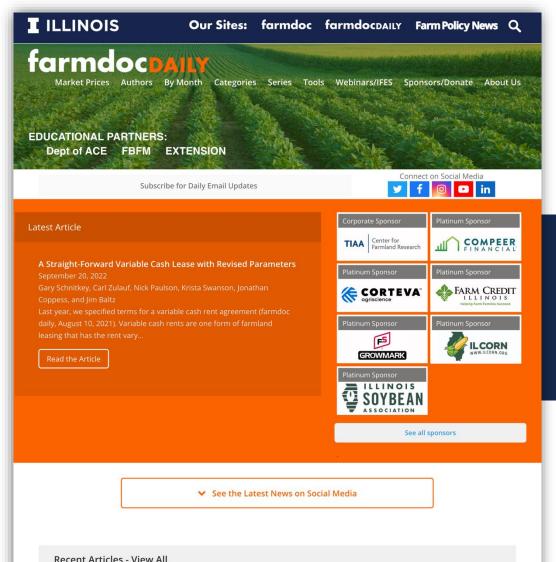








Thank You! Please send any questions/comments to: sherrick@illinois.edu



Visit us at

farmdocDAILY .Illinois.edu



☑ Subscribe for Latest News Updates

ILLINOIS

Agricultural & Consumer Economics

COLLEGE OF AGRICULTURAL, CONSUMER & ENVIRONMENTAL SCIENCES



For the webinar archives and 5-minute farmdoc Subscribe to our channel YouTube.com/farmdocVideo

