

Factors Affecting Farmland Markets

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farmdoc**DAILY**

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Compared to 1 year ago, have farmland values in the area where you live:

- Increased by more than 20%
- Increased by 10-20%
- Increased by 0-10%
- Stayed about the same value
- Decreased in value compared to a year ago

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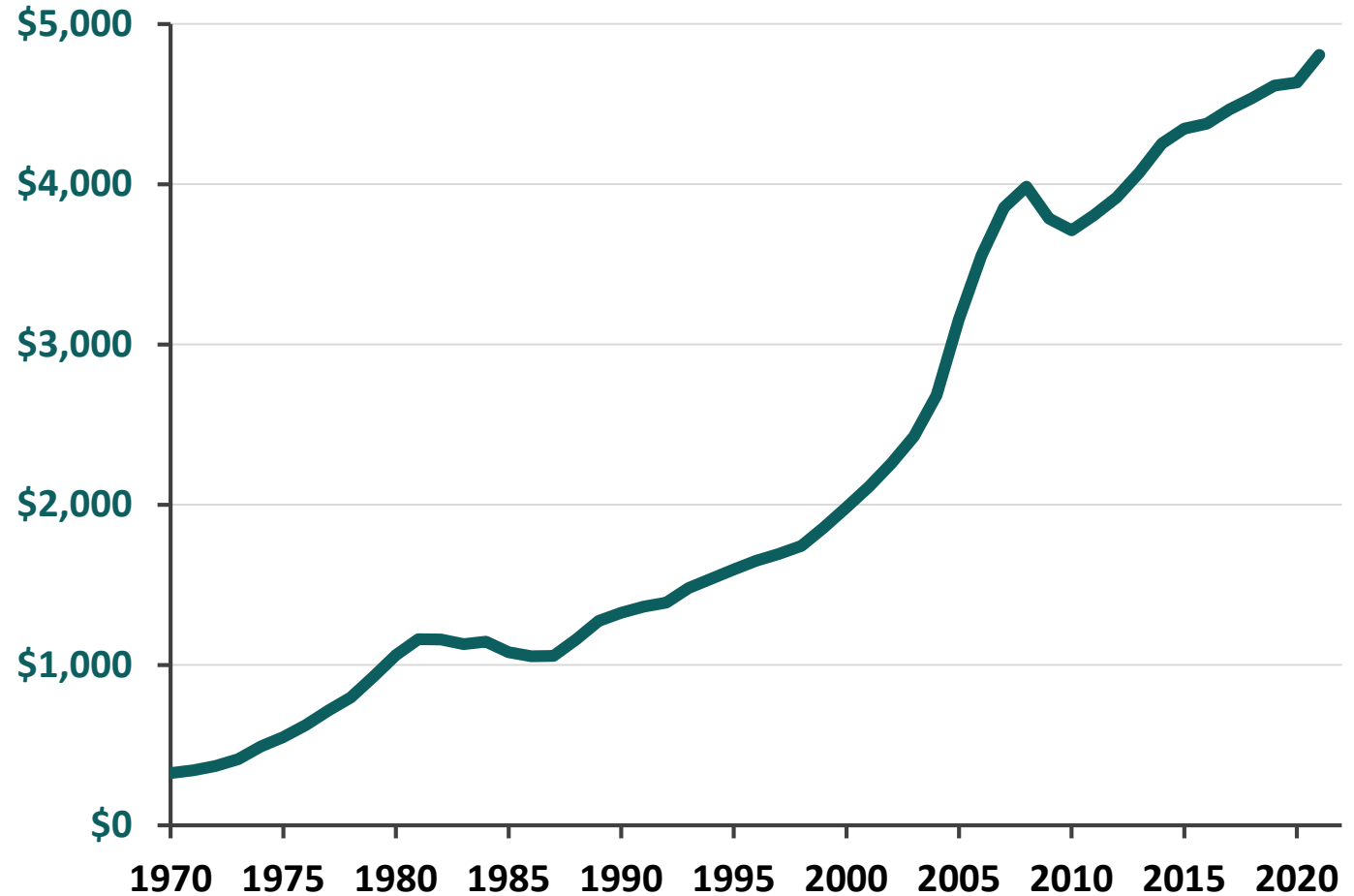


Factors Affecting Farmland Markets

Today's Charge:

Farmland prices have had long periods of stable growth with few periods of declining values. Recent price increases have been very strong and transaction volumes are running above norms....*why and now what?*

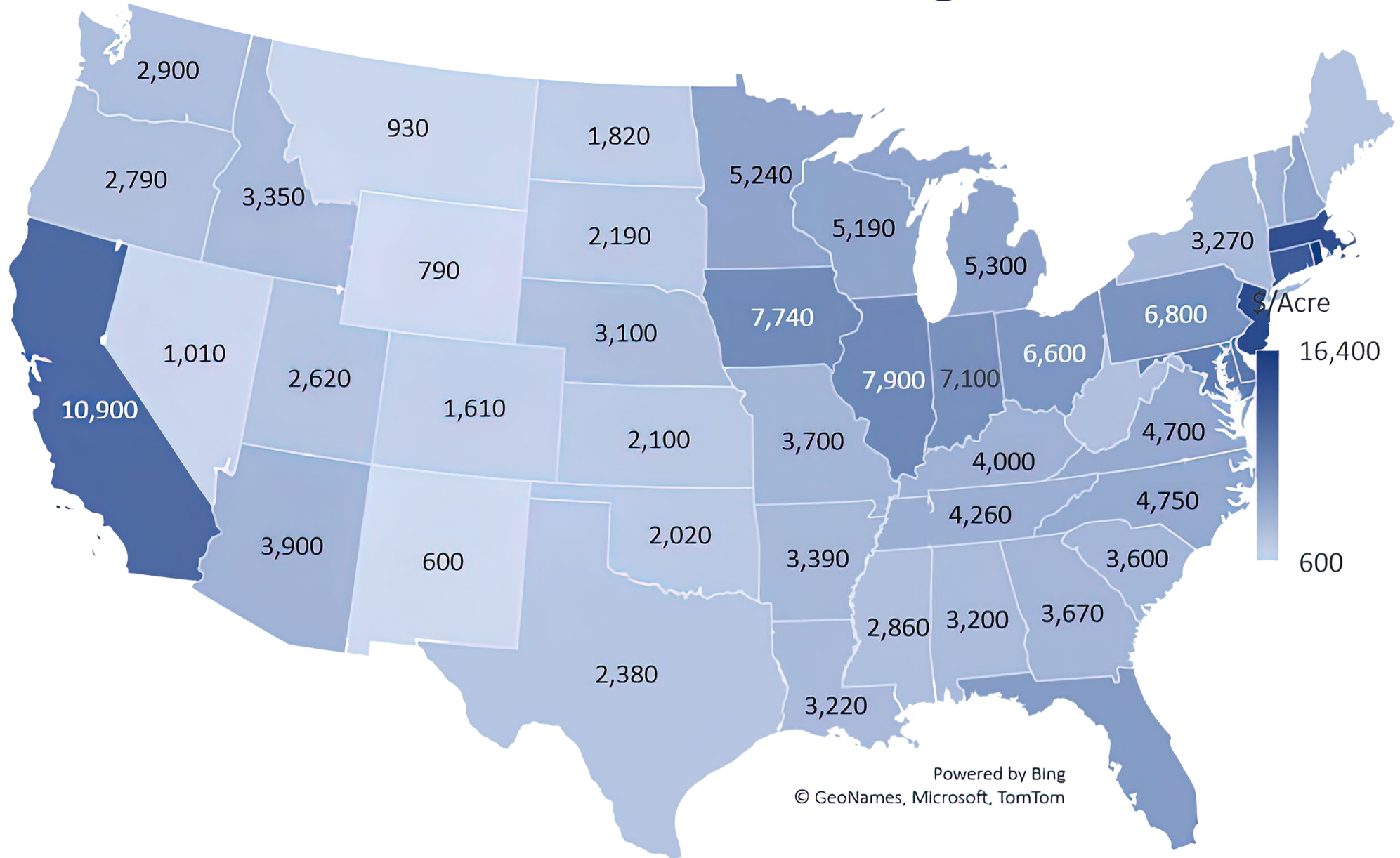
Average of US Farmland Values (all states)



The *why and now what?*

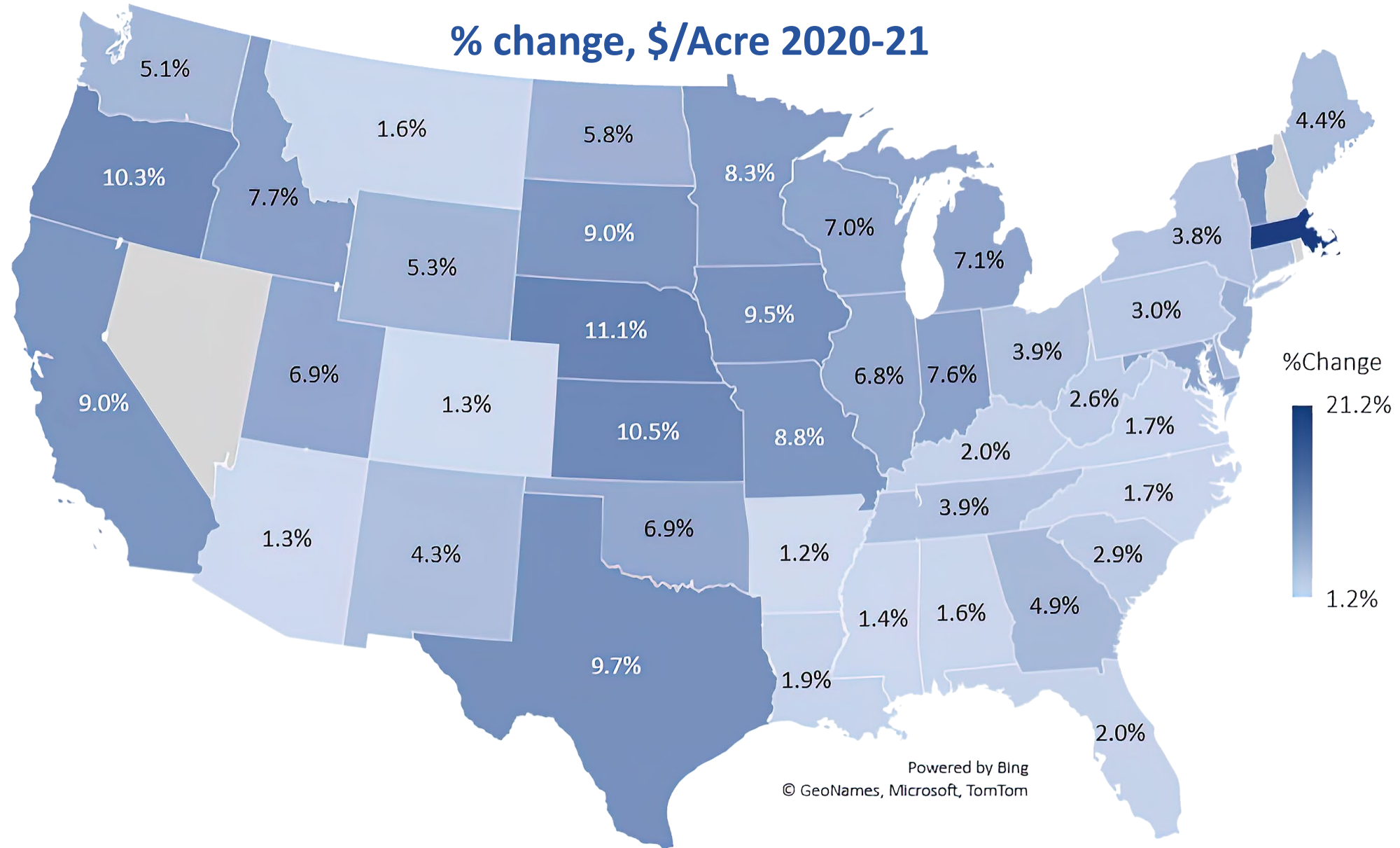
- The Covid-19 period included massive support and stimulus payments, changing food preferences, and interest rate market interventions at unprecedented scale
- Many signs of inflation appearing, but debate about permanence/transitory nature
- Increased commodity prices and prospects for demand growth and stronger incomes
- Changed (?) policy targets and priorities; and concern about tax policies
- Low interest rates and “multiple expansion” in equity markets as well

2021 Farmland Values across regions

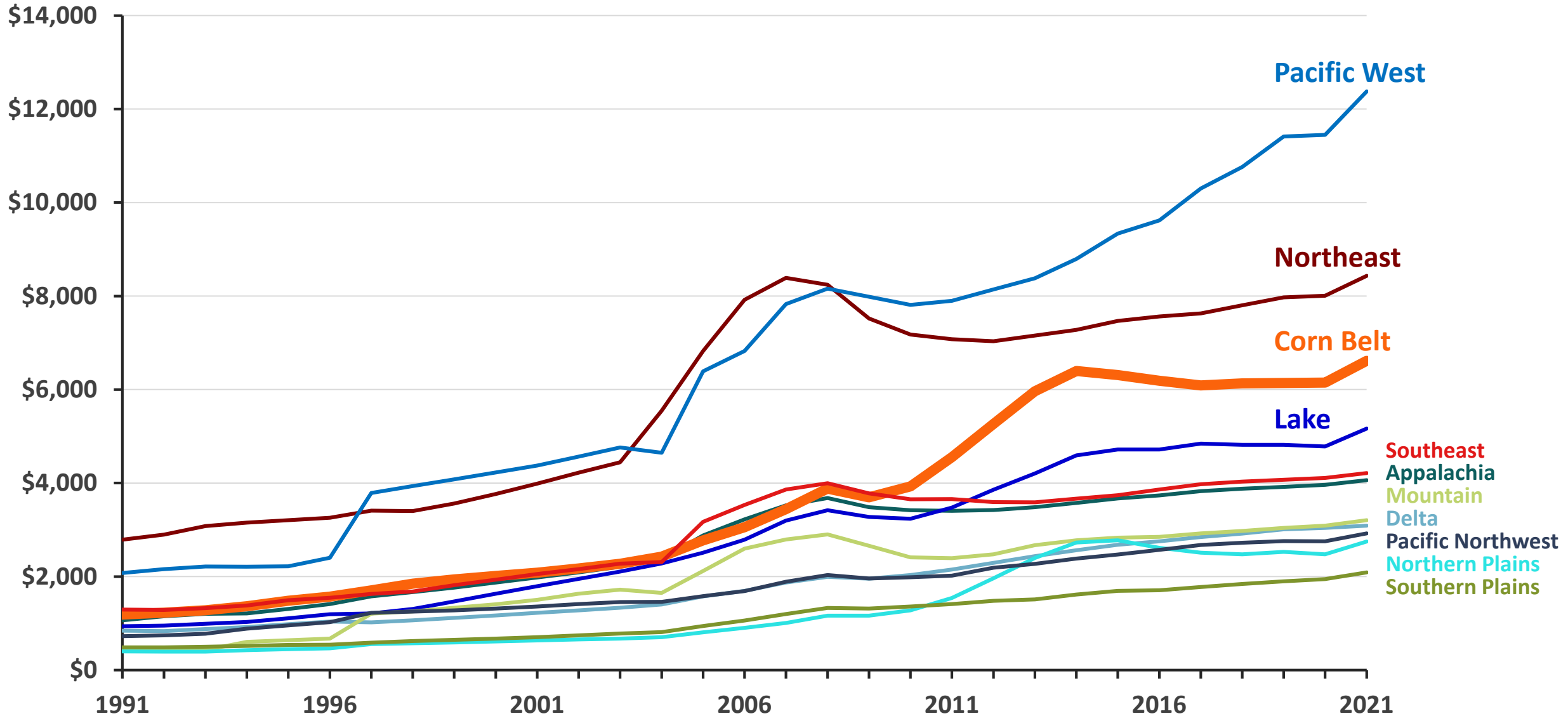


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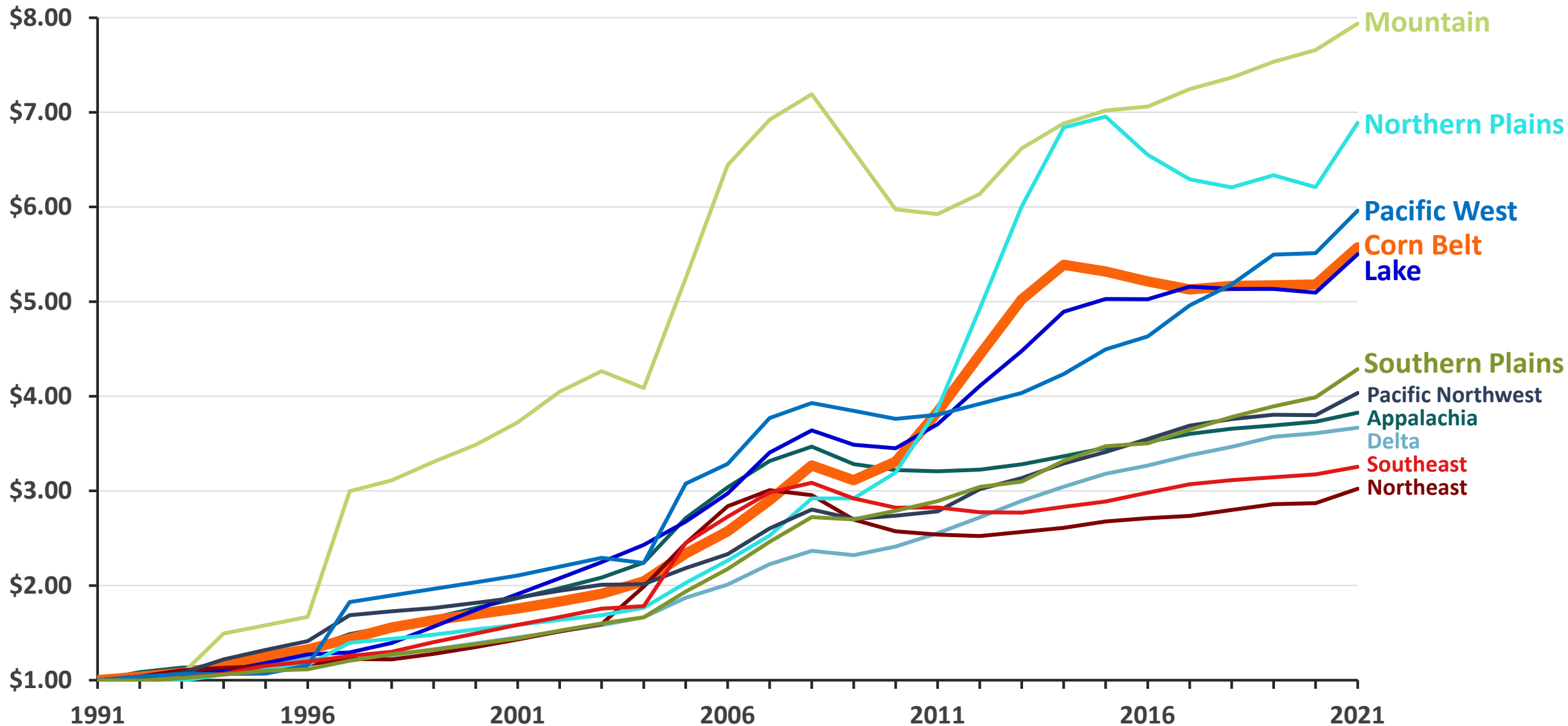
Farmland % increases (mid year USDA estimates)



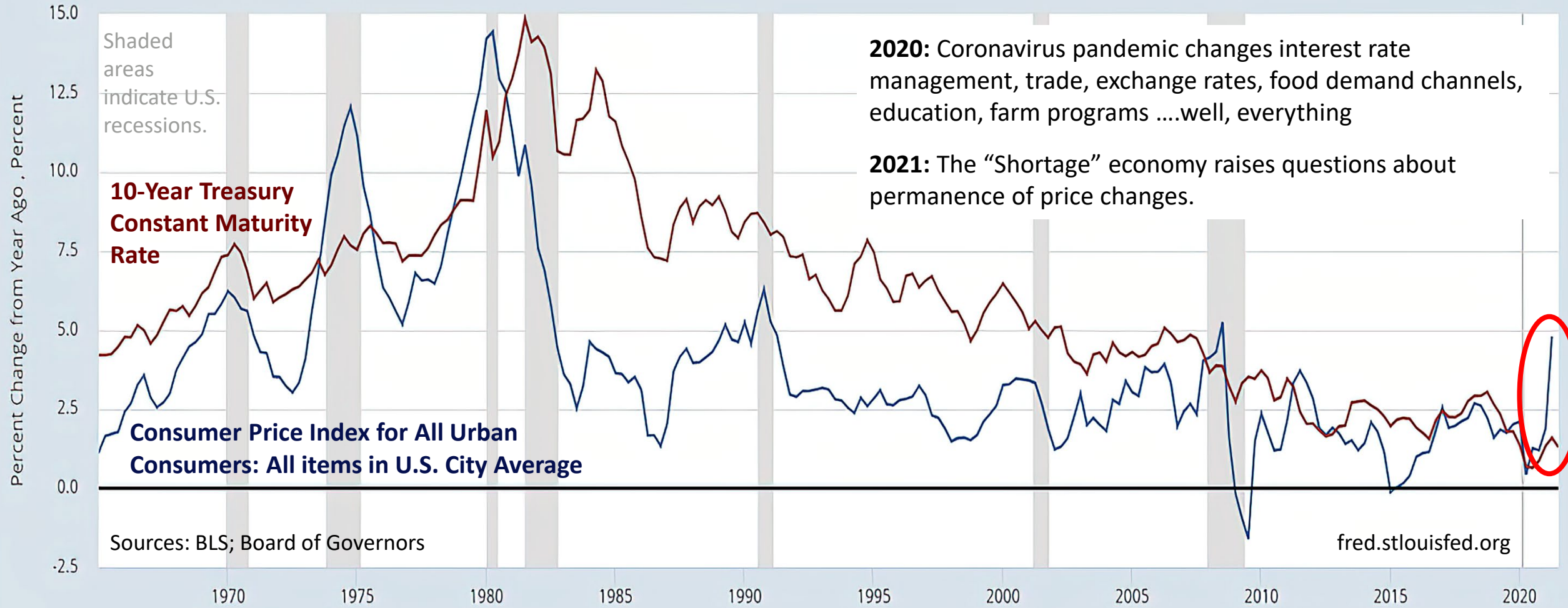
Farmland Prices through time \$/Acre



Farmland Prices \$/Acre relative to 1991



Historic Inflation and Interest Rate Relationships *(update)*



2020: Coronavirus pandemic changes interest rate management, trade, exchange rates, food demand channels, education, farm programs ...well, everything

2021: The “Shortage” economy raises questions about permanence of price changes.

Gold standard ends and inflation increases

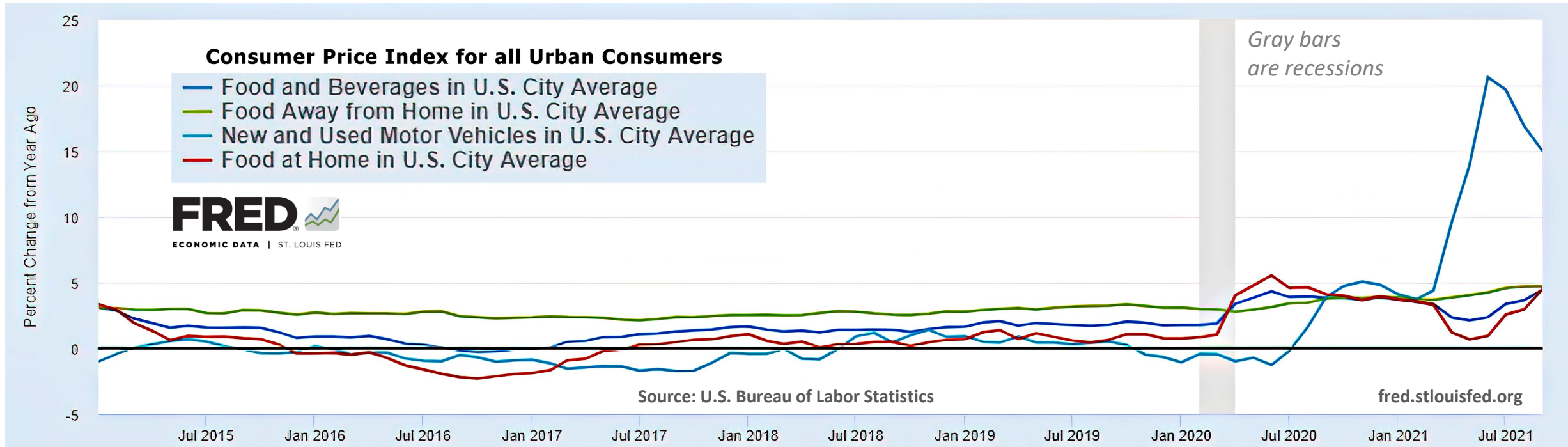
Volcker targets inflation, active rate management

Greenspan era ('87-'06) transparency/economy-driven

post dot.com “normal”

2015 – “All Clear” in banking signaled, normalization begins

Components of inflation – return to never?



Food, Housing, Vehicles, and related components of inflation:

- Share of food at Home – still up
- Cost of Food at Home - up/down
- Share of food away from Home - down, but recovering
- Cost of food away from Home - up
- Housing – up
- Automobiles – up
- Energy?
- Offices and retail inflation?
- Education costs?
- *Farmland?*

Do you expect inflation for the next 3-4 years to:

- Exceed 3% inflation/year
- Average 2-3% inflation/year
- Average 1-2% inflation/year
- Average 0-1% inflation/year
- Be negative (experience deflation)

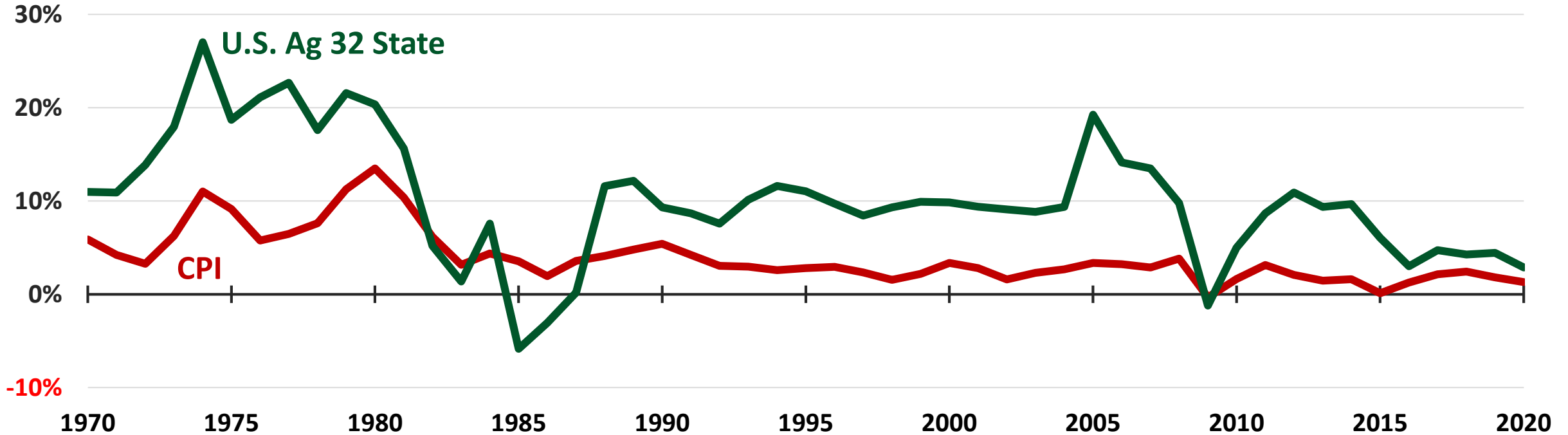
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Farmland Returns and farmland returns minus inflation (spread)



Decade	Farmland to CPI Spread
1970 to 1979	11.1%
1980 to 1989	1.0%
1990 to 1999	6.6%
2000 to 2009	7.6%
2010 to 2020	4.8%
1970 to 2020	6.1%

- 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
- Different Monetary Regimes
- Different Insurance Regimes
- Different Demand Regimes?
- Different Production Regimes?

Balance Sheet of Ag Sector -- US

	1970	1980	1990	2000	2010	2016	2018	2020(p)
	(\$ millions, except ratios - source ERS-USDA)							
Farm Assets	278,823	1,000,422	840,609	1,203,215	2,170,832	2,914,441	3,026,679	3,120,623
Real Estate	202,418	782,820	619,149	946,428	1,660,114	2,443,444	2,519,026	2,575,178
Non Real Estate	76,405	217,602	221,459	256,787	510,718	470,996	507,653	545,445
Farm Debt	48,501	162,432	131,116	163,930	278,931	374,164	401,992	435,175
Real Estate	27,238	85,272	67,633	84,724	154,065	225,980	245,663	283,050
Non Real Estate	21,263	77,160	63,483	79,206	124,865	148,184	156,329	152,125
Equity	230,322	837,990	709,493	1,039,285	1,891,902	2,540,277	2,624,687	2,685,449
Selected Indicators								
Debt/Equity	21.1%	19.4%	18.5%	15.8%	14.7%	14.5%	15.3%	16.2%
Debt/Assets	17.4%	16.2%	15.6%	13.6%	12.8%	12.8%	13.3%	13.9%
Real Estate/Equity	87.9%	93.4%	87.3%	91.1%	87.7%	94.6%	96.1%	95.9%
Real Estate/Assets	72.6%	78.2%	73.7%	78.7%	76.5%	83.8%	83.2%	82.5%
Real Estate D/Tota	56.2%	52.5%	51.6%	51.7%	55.2%	60.4%	61.1%	65.0%

Farmland Returns in Context

Asset/Index	Annual Ave. Return	Standard Deviation	Coefficient of Variation	US Ag 32 States Correlation	Minimum Return	Maximum Return
----- 1990 - 2021 -----						
US Ag 32 States	8.6%	3.7%	0.43	1.00	-1.2%	19.3%
Illinois	9.2%	5.5%	0.60	0.79	0.8%	26.0%
Iowa	10.6%	7.2%	0.68	0.64	-5.3%	24.9%
Indiana	8.9%	4.9%	0.55	0.65	-1.0%	22.0%
Minnesota	10.4%	5.4%	0.52	0.78	-1.8%	20.3%
California	9.0%	5.3%	0.59	0.57	2.5%	32.2%
Washington	13.6%	4.0%	0.29	0.69	5.4%	24.1%
Oregon	11.1%	5.0%	0.45	0.56	-1.6%	23.5%
Kansas	9.9%	6.4%	0.65	0.67	-4.6%	22.7%
Nebraska	11.5%	7.0%	0.61	0.59	-0.8%	31.0%
Wisconsin	8.5%	5.3%	0.62	0.63	-2.2%	18.8%
----- 1990 - 2020 -----						
TCM10Y	4.39%	2.0%	0.45	0.32	0.9%	8.6%
S&P500	7.62%	16.7%	2.20	-0.10	-48.6%	29.3%
Gold	5.02%	14.0%	2.79	0.04	-31.9%	27.7%
CPI	2.34%	1.1%	0.46	0.24	0.1%	5.9%

Average Annual Return to Farmland by Region and Holding Period

Region	1-year	5-year	10-year	15-year	20-year
Delta	4.94%	5.66%	6.75%	7.18%	8.22%
Lake	9.58%	4.50%	6.45%	6.41%	7.76%
Southeast	4.70%	3.93%	3.49%	3.06%	5.12%
Mountain	6.80%	5.56%	6.38%	5.54%	8.18%
Pacific West	10.51%	8.42%	7.32%	7.17%	9.02%
Northeast	5.41%	2.95%	2.82%	1.67%	4.56%
Corn Belt	9.66%	4.32%	6.61%	7.90%	8.75%
Northern Plains	11.72%	4.14%	9.14%	10.64%	11.26%
Appalachia	4.07%	3.31%	3.37%	3.36%	5.14%
Southern Plains	9.50%	6.05%	5.93%	6.64%	7.91%
Pacific Northwest	13.83%	9.05%	9.84%	10.24%	11.19%
<i>NCREIF Ann. Cropland</i>	<i>7.73%</i>	<i>5.40%</i>	<i>7.73%</i>	<i>9.42%</i>	<i>10.62%</i>
<i>NCREIF Perm. Cropland</i>	<i>0.32%</i>	<i>4.69%</i>	<i>12.23%</i>	<i>12.22%</i>	<i>14.71%</i>
<i>NCREIF Total Farmland</i>	<i>4.73%</i>	<i>5.11%</i>	<i>9.51%</i>	<i>10.48%</i>	<i>12.46%</i>

*NCREIF through Q2 2021 estimates

(Source: USDA and TIAA Center for Farmland Research)

Farmland Price Appreciation by date acquired

Cumulative to Present Total Farmland Price Appreciation

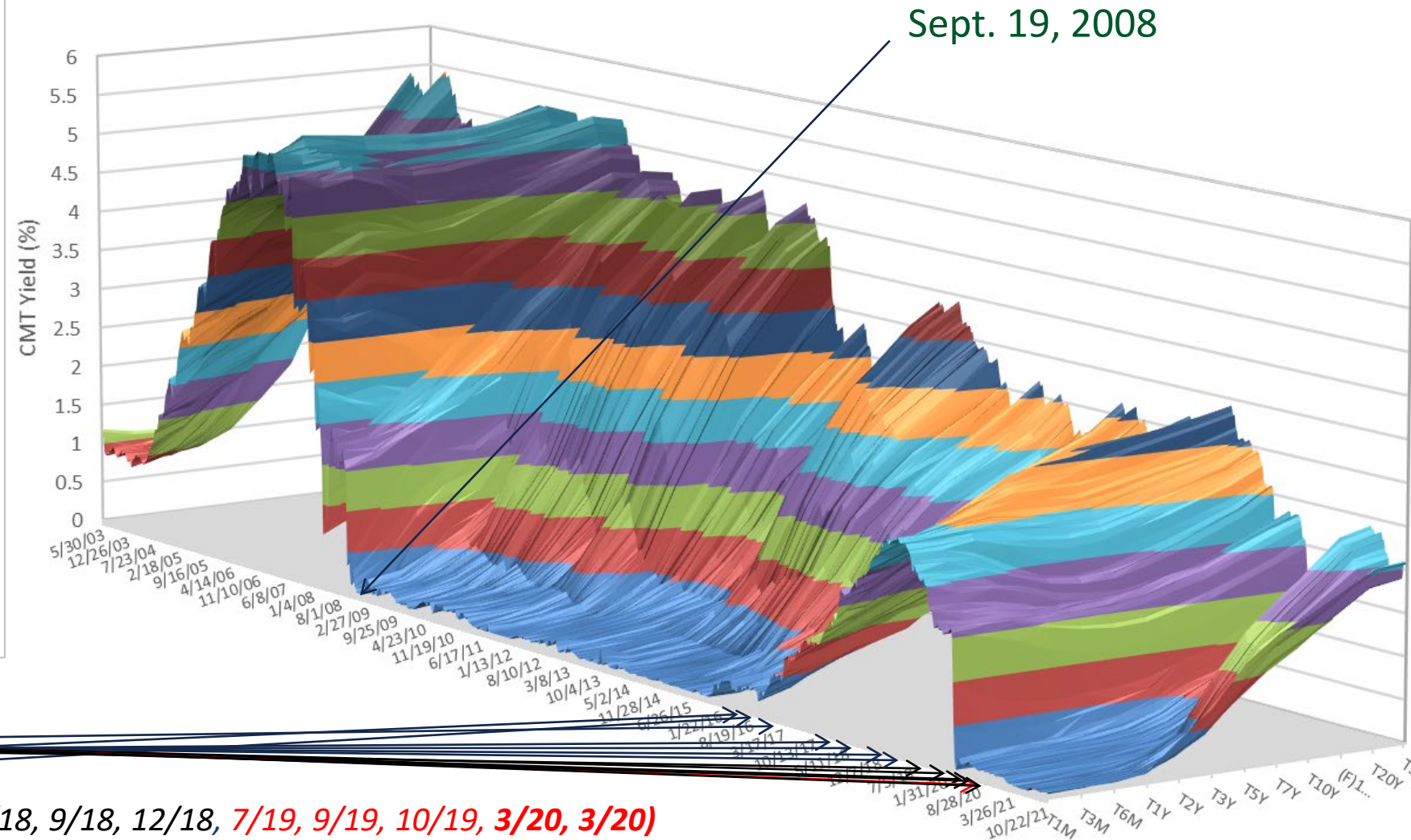
from:	2000	2002	2004	2006	2008	2010	2012	2014	2016	2018	2020
CALIFORNIA	263%	221%	187%	103%	69%	64%	58%	48%	34.9%	16.6%	9.0%
ILLINOIS	250%	236%	209%	120%	74%	67%	27%	6%	8.2%	8.5%	6.8%
INDIANA	214%	189%	158%	118%	73%	70%	22%	4%	4.0%	7.9%	7.6%
IOWA	330%	303%	252%	166%	96%	78%	19%	-7%	5.0%	6.5%	9.5%
KANSAS	236%	216%	200%	141%	106%	98%	39%	2%	9.9%	13.5%	10.5%
MICHIGAN	154%	115%	83%	57%	36%	52%	36%	12%	8.2%	6.9%	7.1%
MINNESOTA	297%	249%	193%	124%	76%	83%	40%	10%	9.4%	8.0%	8.3%
MISSOURI	201%	168%	137%	94%	61%	63%	37%	21%	14.9%	9.5%	8.8%
NEBRASKA	337%	308%	283%	201%	133%	111%	28%	0%	7.3%	12.7%	11.1%
NORTH DAKOTA	349%	339%	296%	214%	136%	122%	57%	2%	4.0%	6.4%	5.8%
OHIO	183%	154%	127%	93%	64%	71%	42%	17%	10.6%	6.5%	3.9%
OKLAHOMA	216%	197%	169%	108%	76%	68%	47%	30%	19.5%	12.2%	6.9%
OREGON	166%	143%	121%	90%	47%	52%	42%	35%	24.6%	14.8%	10.3%
SOUTH DAKOTA	476%	409%	347%	222%	138%	132%	65%	7%	0.0%	5.8%	9.0%
TEXAS	250%	207%	183%	100%	54%	49%	41%	31%	29.3%	16.1%	9.7%
WASHINGTON	132%	109%	91%	69%	44%	43%	28%	18%	8.2%	2.1%	5.1%
WISCONSIN	205%	141%	110%	67%	35%	42%	26%	20%	14.8%	5.9%	7.0%

(Source: USDA and TIAA Center for Farmland Research)

Yield Curve May 2003 – October 22, 2021 (weekly)

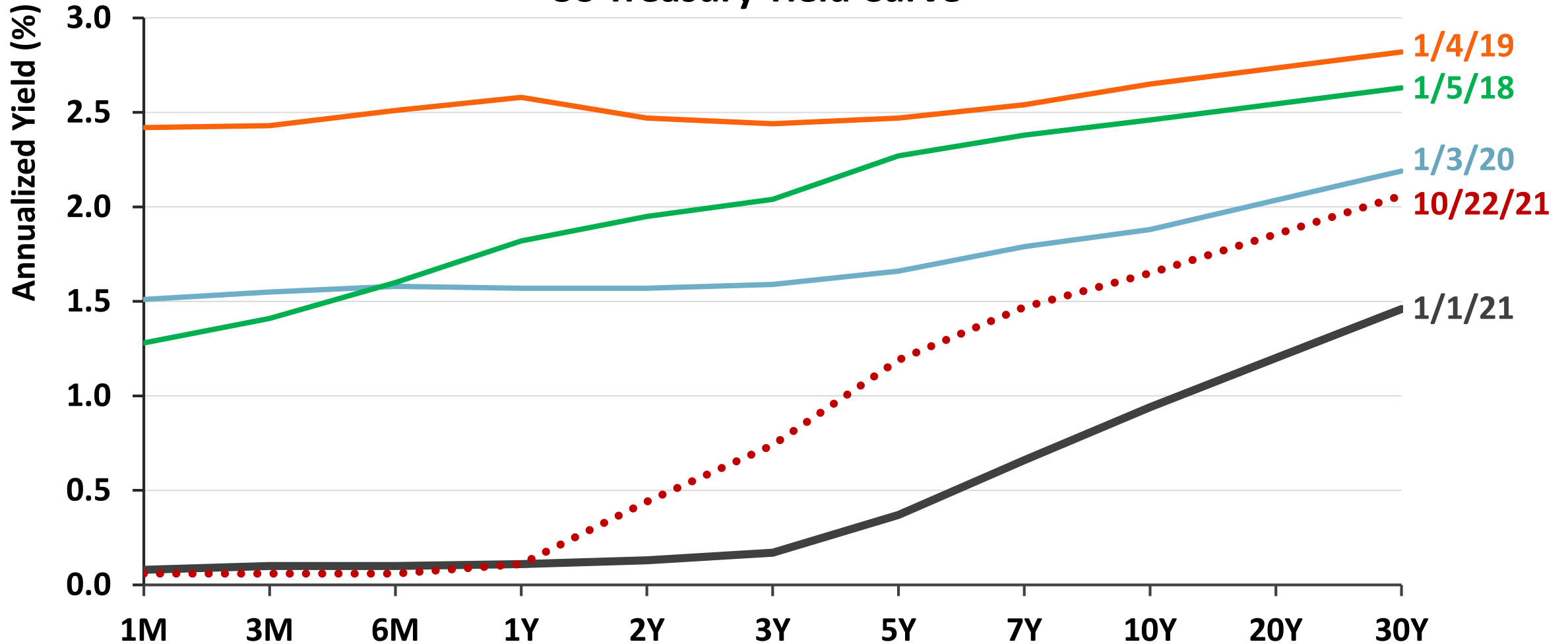
- Credit easing events (TARP, TALF, QE1-3, Twist, Buyback, and DFA+Basel-III) *since 2008+, and since 3/20*
- Low Term Premium
- Multiple expansion
- Massive stimulus 2021?
- Empirical drivers adopted?
- Forward Inflation forecast?
- Tapering debate heating up

IMPACT ON REAL ESTATE?



Term Premium vs. level of rates, and the appropriate discount rate for Ag

US Treasury Yield Curve



Capitalized Value

A very simple (and reasonably accurate) capitalization formula

$$\textit{Capitalized Value} = \frac{\textit{Cash Rent}}{(r - g)}$$

Example:

Cash rent = \$350 per acre

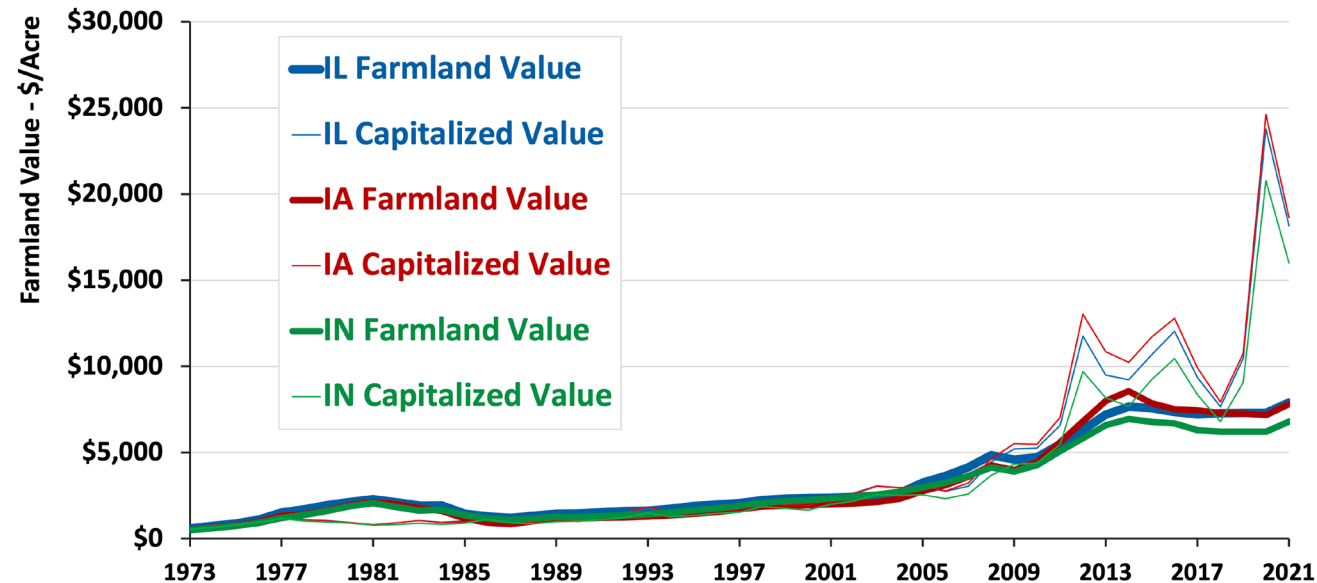
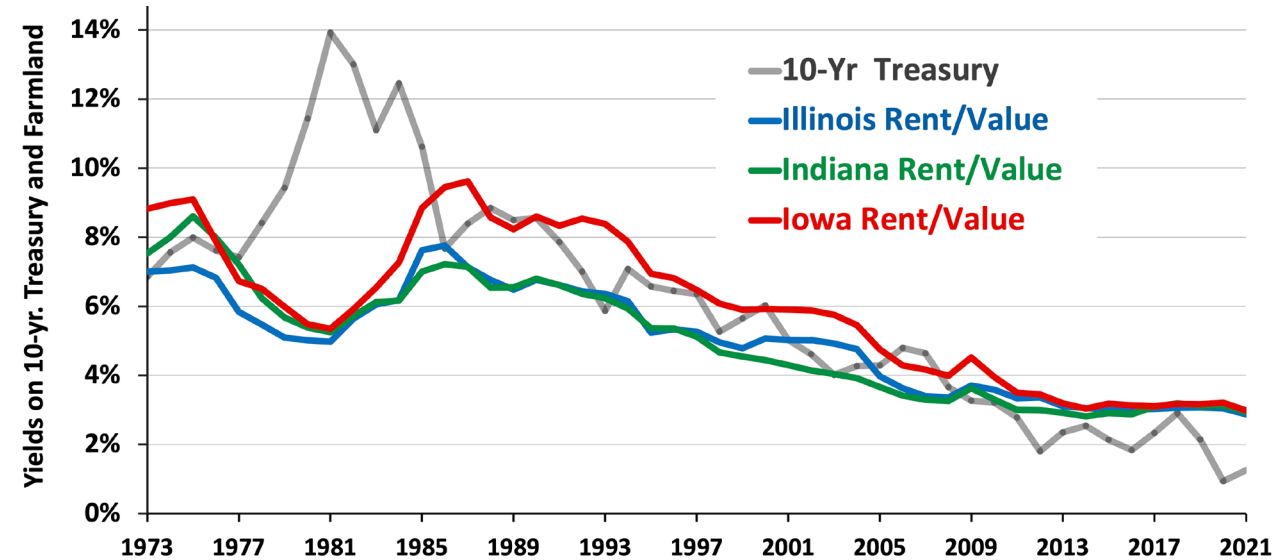
r = 6.5% (required rate of return)

g = 4% (growth rate in return or asset appreciation)

Capitalized value = \$14,000 = \$350 / .025

Do Farm Assets behave like other Financial Assets? Why/Not?

- Farmland returns are positively correlated with inflation, and T-10
- Income expectations and growth drivers uncertain, but “room to run”
- Very different from 1980s – only **negative** divergence
- Low cap rates supportive of values – implied current cap rate = **2.95%**
- Relative yield now attractive compared to fixed income
- Ag income prospects reasonable over long period forward



Do you expect farmland values in one year to:

- Increase by more than 5%
- Increase 0-5%
- Remain unchanged
- Decrease by 0-5%
- Decrease by more than 5%

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

Roll length	PPI	CPI	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%

What About the Strength of *the* Dollar?...“well, it’s still complicated...”

FRED

- (Mexico / U.S. Foreign Exchange Rate), 2020-01-06=100
- (China / U.S. Foreign Exchange Rate), 2020-01-06=100
- (1/U.S. / Euro Foreign Exchange Rate), 2020-01-06=100
- (1/U.S. / U.K. Foreign Exchange Rate), 2020-01-06=100
- (Canada / U.S. Foreign Exchange Rate), 2020-01-06=100
- (Brazil / U.S. Foreign Exchange Rate), 2020-01-06=100



Shaded areas indicate U.S. recessions.

Source: Board of Governors of the Federal Reserve System (US)

fred.stlouisfed.org



Key issues impacting farmland

- Return of inflation or stagflation? Term structure resolution and productivity growth interaction
 - FOMC stance seems clear, but world markets are highly coordinated/integrated
 - Transitory vs. permanent inflation will be better known after tapering decisions are real
- Continued demand growth for commodities in export markets
- Tax Policy impacts on transactions, and resulting market strength
 - More Buyers and Sellers due to recent incomes and tax concerns

Key issues impacting farmland

- Water issues likely to create pressures in other areas for production shifts – “New California Project”
- Ethanol Demand and use of corn in energy markets – EV impacts?
- 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

Key issues impacting farmland

- Consumer preferences and sustainability goals above individual producer level
- Controlled environment production facilities and proximity to final use
- 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
- Rental markets are slow moving and sticky, may require new characteristics

Key issues impacting farmland

- Crop Insurance, changing technologies, and “practices” that overlap programs
- 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 farm-level scale expansion
 - Rationalization of debt within asset class while rates are low?

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
- **Decline by more 5%**
decrease more than 1% per year

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Upcoming Webinar

Nov 4, 2021

Machinery Costs and Management

by Dale Lattz and Gary Schnitkey

The 2021 version of machinery cost estimates for field operations, harvesting operations, and tractors are available on farmdoc. We will discuss the uses of these estimates and the methods used to arrive at these costs. Machinery management revolves around properly sizing machinery and optimizing use.

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Thank You for joining us!

Please submit your questions



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