



NATIONAL  
FALL 2022  
LAND VALUES



[PEOPLESCOMPANY.com](https://www.peoplescompany.com)

A global perspective grounded in rural farming roots and a drive to continually innovate is what makes Peoples Company one of the nation's leading providers of **land brokerage, land management, agricultural appraisal, capital markets, energy management, and crop insurance** services.

With a national footprint, we are able to serve all the major agriculture markets as a full-service national farmland transaction company. Our core business model centers around brokering large, sophisticated land deals around the country, as well as acquiring and managing investment-grade assets for clientele of the highest caliber, including institutional investors, family offices, and high net worth individuals.

Peoples Company's major relationships throughout the industry, with key referral sources and prominent agricultural players, bolster the company's regional strategy and position the company to provide solutions for deals of any scale all across the country.

**It All Starts With Land**

OFFICES

**AgriBusiness Trading Group**

109 West Poplar Street  
 Walla Walla, WA 99362  
 509.876.8633  
 Info@AgTradeGroup.com

**Landmark Ag**

6225 Greenlee Street, Suite 101-#9  
 Arlington, TN 38002  
 901.483.0373  
 LandmarkAg@PeoplesCompany.com

**Peoples Company — Clive  
 HEADQUARTERS**

12119 Stratford Drive, Suite B  
 Clive, IA 50325  
 515.222.1347  
 Info@PeoplesCompany.com

**Peoples Company — DeWitt**

700 6th Avenue  
 DeWitt, IA 52742  
 563.659.8185  
 Info@PeoplesCompany.com

**Peoples Company — Fresno**

7498 Remington Avenue, Suite 106  
 Fresno, CA 93711  
 559.306.6337  
 PacificWest@PeoplesCompany.com

**Peoples Company — Indianola**

113 W. Salem Avenue  
 Indianola, IA 50125  
 515.961.0247  
 Info@PeoplesCompany.com

**Peoples Company — Jonesboro**

1201 Nettleton Circle  
 Jonesboro, AR 72401  
 870.275.6249  
 Info@PeoplesCompany.com

**Peoples Company — Marlette**

6446 Morris Street, PO Box 125  
 Marlette, MI 48453  
 989.635.0086  
 Info@PeoplesCompany.com

**Peoples Company — Monroe**

606 Acadian Lane  
 Monroe, LA 71203  
 318.307.5811  
 Info@PeoplesCompany.com

**Peoples Company — Omaha**

10665 Bedford Avenue, Suite 102  
 Omaha, NE 68134  
 402.334.0256  
 Info@PeoplesCompany.com

**Peoples Company — San Diego**

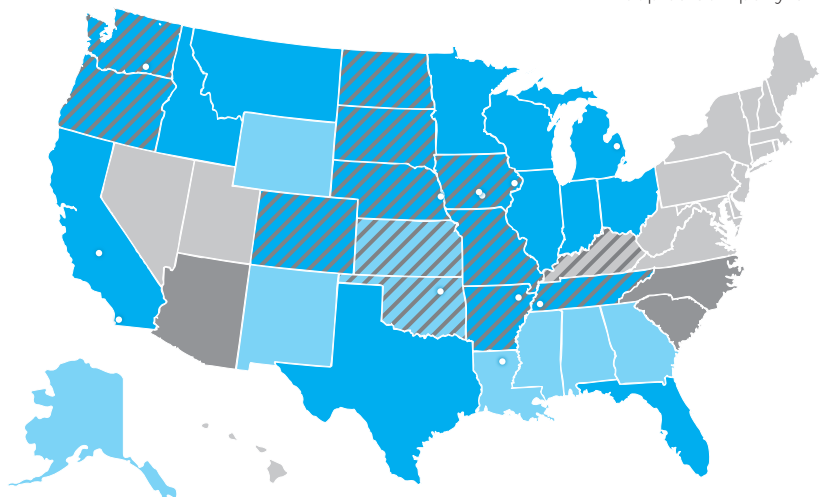
2150 W. Washington Street, Suite 501  
 San Diego, CA 92110  
 619.618.0540  
 PacificWest@PeoplesCompany.com

**Peoples Company — Tulsa**

110 S. Hartford Avenue, Suite 2553  
 Tulsa, OK 74120  
 539.600.1007  
 Info@PeoplesCompany.com

LICENSING MAP

- Land Management, Brokerage and Appraisal Licensed States
- Land Management and Brokerage Licensed States
- Appraisal Licensed States
- ▨ Crop Insurance Licensed States
- Consulting Available
- Peoples Company Office



Peoples Company is privileged to work across all the major agricultural regions in the United States appraising farmland, brokering farm assets, managing farms, and deploying capital for investors looking to invest in the asset class. To inform decision-making in the year ahead, we present our third annual Land Values Report, which explores how rising inflation, increasing geopolitical pressures, and U.S. policies have impacted the farmland asset class as a whole and on a regional basis.

U.S. farmland will enter 2023 in a financial market that is radically different than the market of 2020, 2021, and 2022. In 2022 alone, total value of U.S. farmland real estate increased \$292 billion in value. This has set the stage for the farmland asset class to surpass \$4 trillion in total value in the next year. Farmland values appreciated significantly during the last three years as buyers sought safety in hard assets because of lockdowns, market volatility, and commodity disruptions globally because of the war in Ukraine. Simultaneously, many buyers entered the market as a hedge, mindful that record government spending and current monetary policy would lead to higher inflation. In 2022, inflation fears were realized. Many goods saw price increases of 10% or more, and the Federal Reserve hiked interest rates rapidly as it attempted to rein in price appreciation. Farmland stood out during this period of chaos for its remarkable stability and the quality returns it provided.

The 2022 Land Values report highlights how this perfect storm of economic factors came together to create a run-up in land values. Several regions experienced below average annual growth for the years prior to 2020 due to stagnant commodity prices. From 2018 to 2021, infusions of almost \$54 billion buoyed the agricultural sector via the Market Facilitation Program and Coronavirus Food Assistance Program. Simultaneously, the commodity markets experienced a significant jump in value. This added to farm operators' net income and created even greater returns. Furthermore, until early 2022, interest rates remained at near record lows and enhanced borrowers' farmland buying power.

With this rapid run-up in prices and interest rates, the question becomes whether or not farmland values will appreciate in 2023. This year's report provides an overview of the policy drivers that will impact farmland values moving forward, specifically, the Inflation Reduction Act of 2022. The policy goals advanced through this legislation would create significant new revenue streams for farmland owners through massive increases in renewable electric generation, payments for sequestered carbon, and renewable fuels deployment.

Last year's report predicted a strong year for farmland values in 2022. Rising interest rates will certainly create a headwind for leveraged buyers in 2023, however, we think the combination of farmer profitability and farmland's correlation with inflation coupled with some key policy drivers will set the table for another year of price appreciation in farmland assets.

As we strive to provide reliable data to landowners, investors, and managers nationwide, we welcome your feedback, observations, and questions about this report.

*A special thank you to Bruce Sherrick, Professor and Director of the TIAA Center for Farmland Research, and Eric O'Keefe, Editor of The Land Report, for their input and expertise.*



**STEVE BRUERE | President, Peoples Company**



## Table of Contents

- 4** National Farmland Market Overview
- 12** Pacific West Market California
- 14** Pacific Northwest Market
- 16** Delta Market
- 18** Lake States Market
- 20** Southeast Market
- 22** Corn Belt Market
- 25** The Irony of the Inflation Reduction Act for the Farmland Asset Class
- 30** Tracking the Performance of Farmland Investments: The National Council of Real Estate Investment Fiduciaries (NCREIF) Farmland Index





# NATIONAL FARMLAND

By **Bruce Sherrick**,  
Professor & Director  
TIAA Center for Farmland Research,  
University of Illinois

## Market Overview

U.S. farmland markets have continued their surge across much of the country during 2022, extending the bull market that has been building for the past two-plus years. Higher commodity prices, along with strong farmer balance sheets that reflect the accumulated Covid-related payments, federal market stimulus through monetary expansion, direct transfers, and even remnants of payments begun during what now seems like a distant trade war, all contributed to the demand side of the pricing boom. Until the recent reversal of the Federal Reserve (Fed) interest rate posture, low debt costs were also a supporting factor for farmland markets.

**In place of low interest rates, the role of farmland as an inflation hedge has now taken center stage in the minds of investors, leading to continued high demand for quality farmland investments.**

In last year's National Land Values Market Overview, much of the discussion focused on monetary policy and stimulus spending, with an assumption that the end of the active phase of the pandemic would also allow an orderly return to financial market capital allocations and an absorption through inflation of any stimulus in excess of transitional spending. Unfortunately, world transitions remained complicated by events that further stoked the inflation fire and led to heightened equity market volatility, including the Russian invasion of Ukraine in early 2022; additional supply chain interruptions in critical agricultural input channels; and continued massive federal spending that was largely funded by debt placed on the Federal Reserve's balance sheet. And, as shown later in this article, the nearly unprecedented pace of interest rate increases and signals by the Fed – while historically abrupt – do have historic context and implications for length and level of the inflationary period in front of us.

To build on the intent of this publication and provide an annual update with reasoned explanations, it is appropriate to revisit and connect to information from the prior year. The reasonably positive projections from a year ago have again turned out to be mostly accurate, though a bit modest compared to actual farmland performance. While transactional markets have begun to taper in some parts of the country, prices increased more than anticipated over the past twelve months and have remained stronger than might have been predicted at this time last year, again buoyed by strong commodity prices, farmer opportunism, and concern about volatility and risk-asset valuations in alternative investments. The tone of agricultural policy has remained positive and medium- and longer-term prospects for continued expansion of commodity demand remain positive as well. Historically, farmland has fared very well in inflationary environments, and there are no obvious reasons to expect otherwise this time

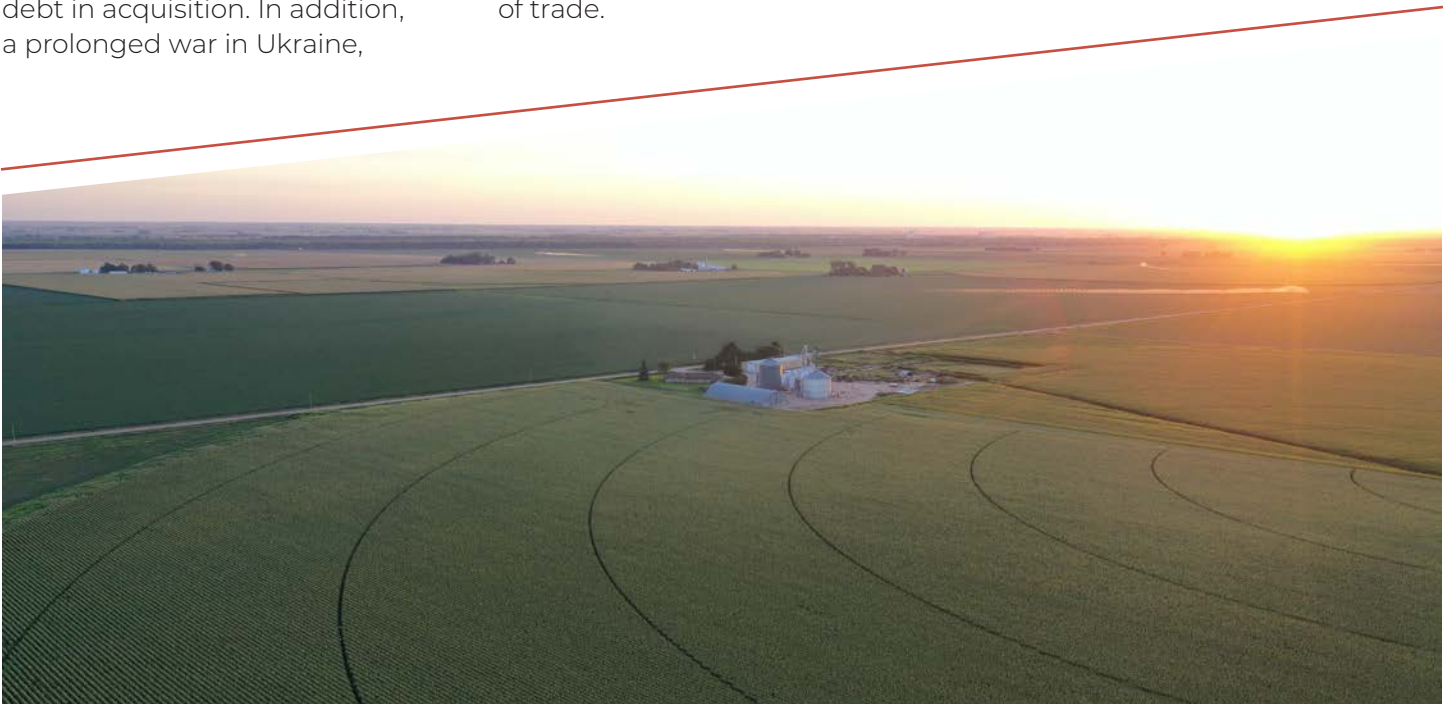




around. Finally, support from crop insurance programs, combined with the return of a policy environment that embraces ad hoc payments and financial support for practices related to climate and carbon objectives, round out some of the positives for future farmland values. The headwinds include strength of dollar concerns along with dimming prospects related to a longer and deeper recession than initially signaled by the Fed with the attendant interest rate levels that limit the use of debt in acquisition. In addition, a prolonged war in Ukraine,

combined with continued world political unrest, especially as related to energy markets, could drag all financial and real asset returns down through damages to real markets and siphoned purchasing power from consumers. Taken in total, the general tone for 2023 is one of guarded but continued optimism, particularly with respect to alternative investments, but with elevated concern about the state and trajectory of the general U.S. economy and the ability for world coordination of essential channels of trade.

To help provide additional grounding for the performance of agricultural assets, as well as the prospects for the future, updated data on national land values, income versus appreciation along with total returns, and potential impacts of several of the key factors noted are provided first. The report then turns to regional updates which include historic performance and more specific treatment of local factors impacting returns to agriculture.

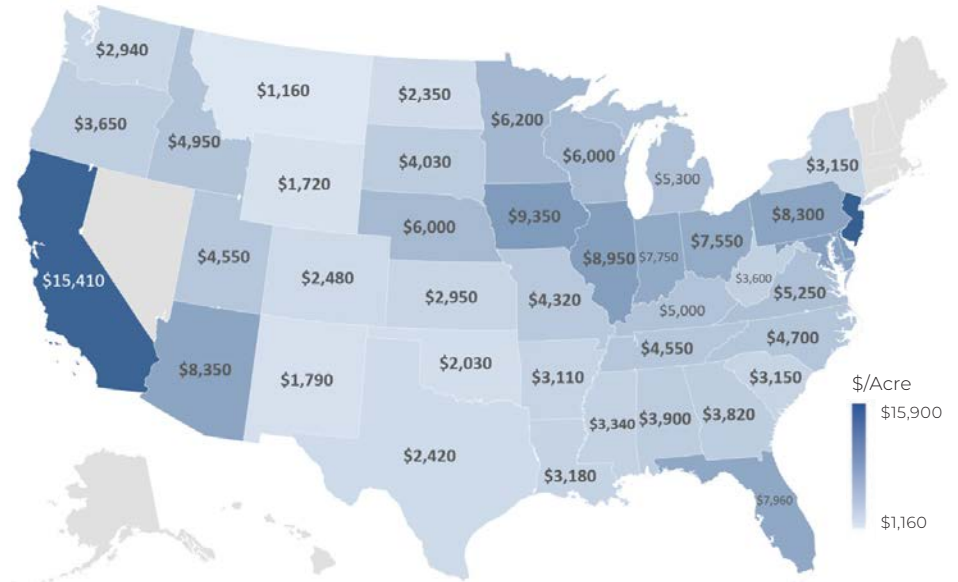




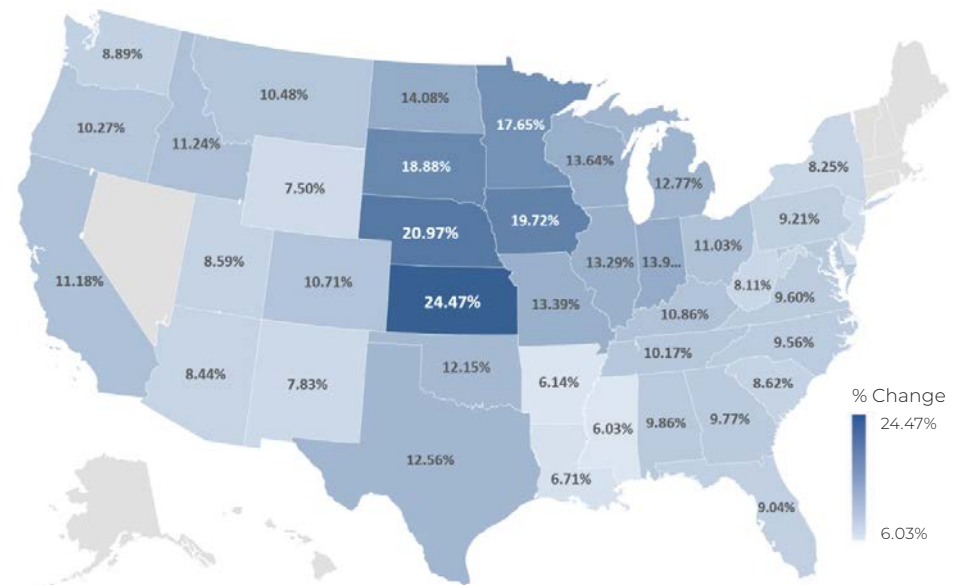
## FARMLAND MARKETS A simple taxonomy, and history repeated

Agricultural land is generally classified by use and type, including cropland, pastureland, and a third category that combines all farmland and real estate, including buildings and fixtures. Cropland is further divided by use into categories of annual row-crop production (e.g., corn, soybeans) and permanent crops (e.g., citrus, tree nuts, wine grapes). The USDA publishes the results of its annual survey of land values and lease rates by category, along with related information about acreage and use changes, while the National Council of Real Estate Investment Fiduciaries (NCREIF) provides complementary quarterly information on performance of institutionally owned and professionally managed agricultural assets. NCREIF has further identified production regions which naturally group states with similar production features and market access. In the materials that follow, these overviews and derived summaries from individual states and production regions are presented to provide a comprehensive view of the performance of farmland investments both through time and by crop/region of major influence. In the end, farmland values are determined by the relative income earning potential in agricultural use, which is derived from relative productivity and output market conditions. As with other financial assets, farmland is valued based on what it expected to earn relative

**FIGURE 1** — **Cropland Values \$/Acre 2022**  
Source: USDA Land Values 2022 Summary, August 2022



**FIGURE 2** — **Cropland Percentage Change \$/Acre 2021-22**  
Sources: USDA Land Values, TIAA Center for Farmland Research



to its cost of capital, as well as the relative performance of competing assets.

It is instructive to establish relative scales and recent

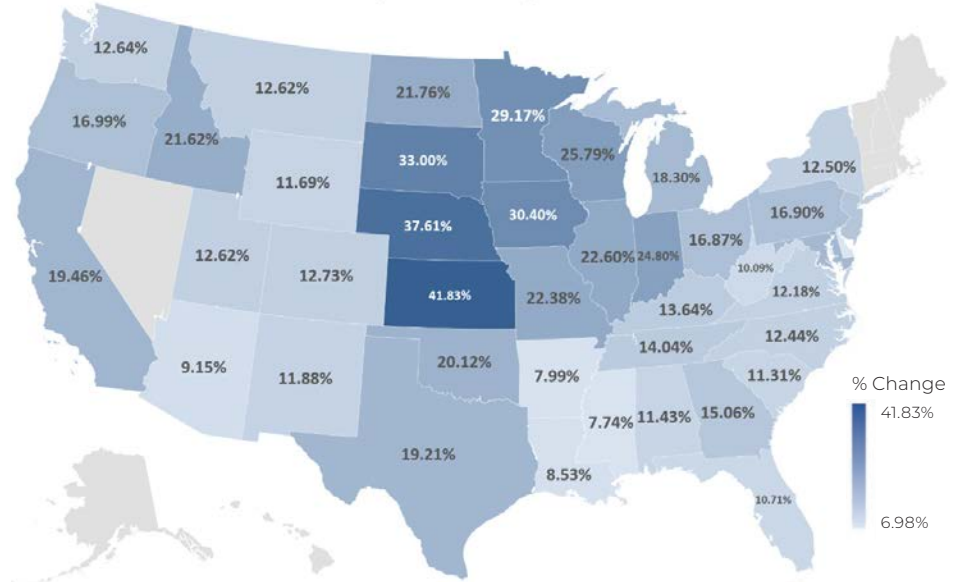
movements in values. Figure 1 shows 2022 average cropland values by state, and Figures 2 and 3 show the percentage changes in value from one year and two years, respectively.

Note that USDA data are released mid-year and are likely to continue to show strong appreciation results into the near future, based on market data from the third quarter of 2022. Further supporting this view, NCREIF and regional surveys have shown continued price increases during the third quarter and into the fourth quarter of 2022 as well. Importantly, USDA data are for all cropland, including small farms and hobby holdings that would not be considered commercially viable. As a result, USDA data are often viewed as understating prices and financial performance relative to farmland that farmers and investors consider to be investment grade and most suitable for commercial scale agricultural production.

In addition to the capital appreciation of farmland, annual incomes have been strong and will likely register near records in much of the row crop production areas in 2022-23 as well. Figure 4 shows total return estimates based on USDA data by state, derived from rental income plus appreciation, less property taxes and maintenance expenses. In these cases, annual cash income can reliably be estimated on a consistent basis through time, with changes reported on a consistent basis. Importantly, while these are estimates averaged across all properties in a state, and thus mask the wide variation in individual experiences that could be expected to be encountered

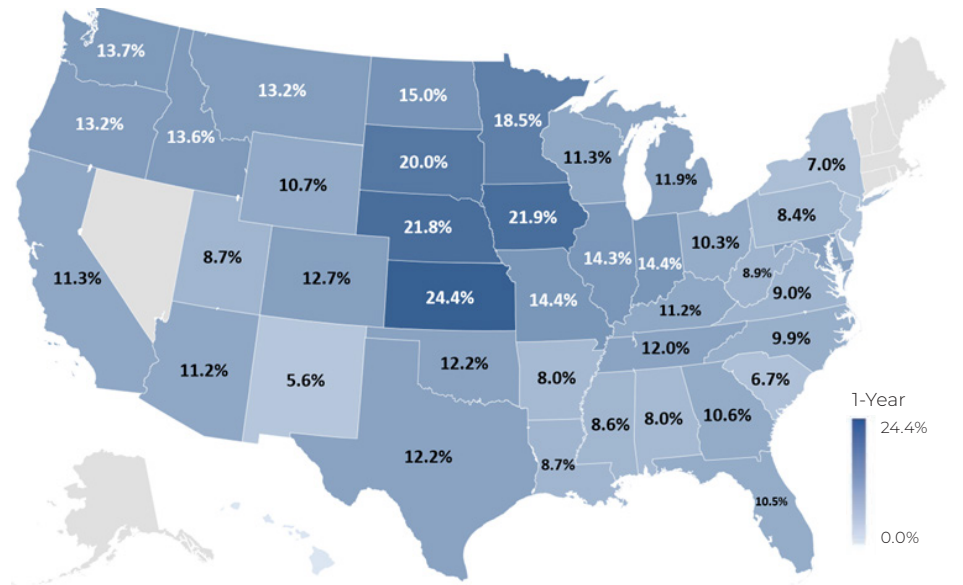
**FIGURE 3 — Cropland Percentage Change \$/Acre 2020-22**

Sources: USDA Land Values, TIAA Center for Farmland Research



**FIGURE 4 — Total Annual Return 2022 (Est)**

Sources: USDA, TIAA Center for Farmland Research



on a single farm, they are also likely conservative relative to commercial scale agricultural operations' results. In any case, farmland performance remains strong by historic standard, and

even more impressive when compared to other investment opportunities such as equities or bonds.

Table 1 provides additional historic context by aggregating this information into the same production regions used by NCREIF to group areas with similar production crops and practices, reporting total returns for these regions by hold period over selected intervals to 20 years. In addition to regional totals based on USDA data, the lower three rows provide total performance for assets held in the NCREIF index by type of production.

### HEADWINDS, TAILWINDS, AND CROSS CURRENTS IN FARMLAND MARKETS

It is important to consider the economic, political, and monetary system environment in which we are examining farmland, with particular attention to inflation prospects, interest rates and leverage, and outyear income prospects.

As recently as a year ago, the Fed was continuing its stance that inflation would return naturally to a lower level, despite the mountainous empirical evidence of escalating inflation pressures. Practicing economists were mostly united in forecasting that the impact of quantitative easing and direct stimulus would lead to price and wage inflation. They also predicted that direct observational measures of price changes – whether originating from supply chain interruptions or from monetary excess – signaled “real” rather than purely temporary inflation in which the quantity of production was essentially unchanged, but just not to-market yet.

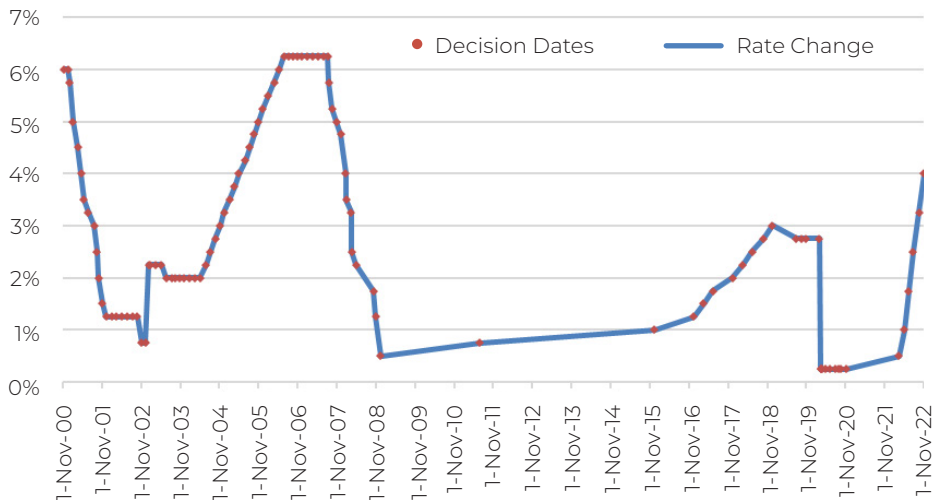
**TABLE 1** Total Cropland Return by Hold Period

Sources: USDA, NCREIF, and TIAA Center for Farmland Research

Region	HOLD PERIOD				
	1-Year	5-Years	10-Years	15-Years	20-Years
Appalachia	10.18%	4.61%	4.24%	3.40%	5.28%
Corn Belt	15.09%	7.12%	6.45%	7.95%	9.08%
Delta	8.41%	6.04%	6.61%	6.80%	8.17%
Lake	13.91%	6.13%	6.56%	6.27%	7.89%
Mountain	11.86%	6.61%	6.87%	5.45%	8.27%
Northeast	8.10%	4.14%	3.45%	1.76%	4.59%
Northern Plains	20.29%	8.01%	8.59%	10.93%	11.80%
Pacific Northwest	13.46%	9.75%	9.87%	9.86%	11.17%
Pacific West	11.27%	8.13%	7.90%	7.02%	9.04%
Southeast	8.81%	4.55%	4.37%	3.04%	5.22%
Southern Plains	12.19%	7.37%	6.46%	6.46%	8.11%
NCREIF Total Farmland	10.21%	6.54%	8.99%	10.30%	12.78%
NCREIF Annual Cropland	14.43%	8.00%	7.77%	9.46%	11.14%
NCREIF Permanent Cropland	4.05%	4.42%	10.83%	11.67%	14.74%

**FIGURE 5** Discount Rate 2000-Present

Source: Federal Open Market Committee (FOMC)



In any case, the farmland market (and many other real asset markets) seemed to fully understand and anticipate the need for inflation and for real interest rates to re-converge, and maintained its historic response to inflation expectations. Interpreted another way, despite the

pattern of interest rate targets communicated by the Fed, the market essentially pre-cast the rate levels more smoothly than the Fed’s own actions. Figure 5 shows the Fed’s reversal swings around specific macro shocks of the housing crisis of 2008, followed by a “return to market” period from 2016-20,



and then the complete reversal again that began in response to the pandemic shutdown. Finally, the chart highlights the rapidity of the recent sequence of rate hikes, triggered by an acknowledgement that transitory inflation was no longer a reasonable narrative and that the monetary stimulus that resulted in inflation would need to be drawn back out of the market through higher rates.

The artificially low interest rates resulting during the pandemic would have been even more supportive of higher income multiples paid for real assets, but farmland has both low aggregate leverage and a strong positive correlation to returns with real inflation. Accordingly, the information

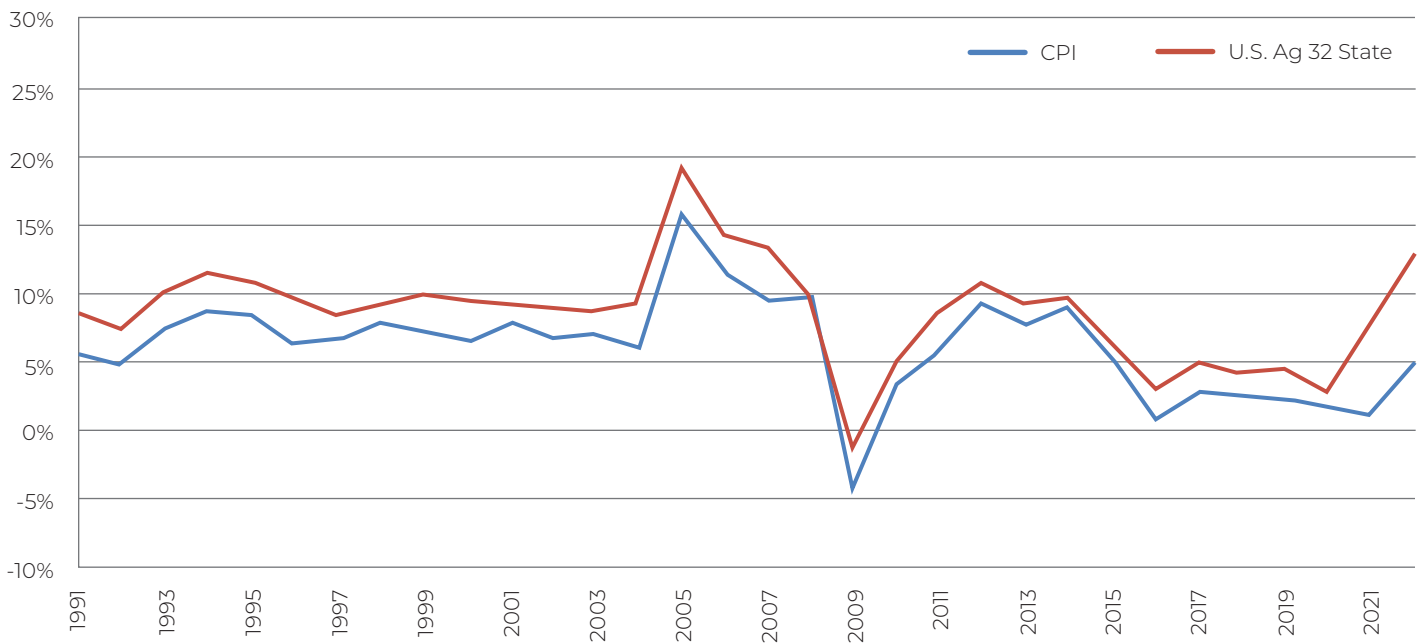
provided a year ago about the relationship between inflation and farmland values seems even more prescient and important to repeat now.

Figure 6 below shows the historic relationship between aggregate farmland returns and inflation, as measured by the Consumer Price Index (“CPI,” all prices, non-seasonally adjusted). Importantly, the blue line shows the amount by which farmland exceeds inflation and demonstrates the remarkable correlation displayed through time by farmland. A potential difference worth noting relative to past inflationary bouts is that, during the pandemic and trade war episodes, the debt issued by the Treasury was virtually entirely purchased directly by

the Fed, rather than passed through to traditional investors with rates determined by market decisions. In other words, the inflation rate and interest rate relationships may be connected less directly than in historic cases, and thus more subject to Fed actions, which could stymie the connection through real price pressures for commodities that are typically the mechanism for higher (nominal) incomes to fixed factors of production, such as land. Whether this historic relationship will continue into the future or not is an empirical issue, of course, but the historic strength at least gives comfort to the notion that the correlation will continue in the future – and thus that the inflation hedging properties of farmland investments will remain as well.

**FIGURE 6** Farmland Aggregate Returns and Inflation 1991-Present

Sources: Bureau of Labor Statistics, USDA, TIAA Center for Farmland Research



**TABLE 2** — **Projected Prices, Harvest Prices, and Volatilities: Corn and Soybeans**

<b>Corn</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>	<b>2016</b>	<b>2017</b>	<b>2018</b>	<b>2019</b>	<b>2020</b>	<b>2021</b>	<b>2022</b>
Projected 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	6.86
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
<b>Soybeans</b>												
Projected 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	13.81
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

Income prospects for the agricultural production sector have also been widely debated in light of higher input costs stemming from increases in energy and derived fertilizer costs as well as from other inflating input costs. However, the revenue side of the equation, particularly in areas that grow annual crops, also experienced highly supporting price increases, even under reasonably high total production. Table 2 summarizes two critical price

sequences through time – the spring insurance coverage price for revenue insurance, or the “Projected Price,” and the resulting fall insurance coverage price, or the “Harvest Price.” The higher of the two is essentially the price guarantee for that year’s production. One has to look back to the drought of 2012 to find comparable price environments, and importantly, 2012’s production was very low, resulting in higher prices unlike 2022, in which production will

be at or above trend in many of the most intense production regions. Furthermore, the out-year futures and forward prices for 2023-2024 are still relatively strong for corn, soybeans, and wheat, perhaps signaling both the impact of the interruptions in production stemming from the Ukraine war, as well as prospects for continued expanding demand, both due to world consumption and additional potential uses in energy related markets.





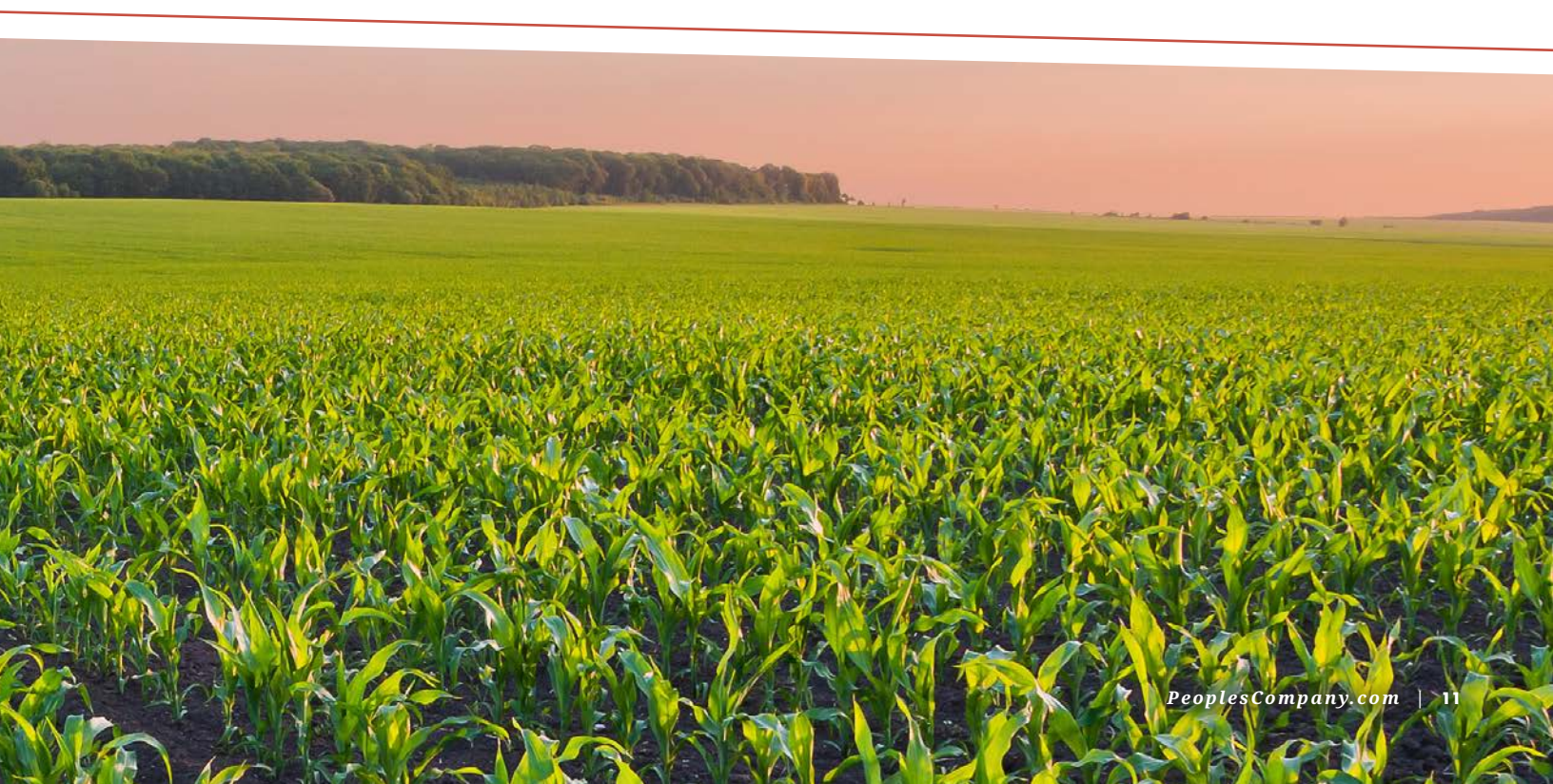
Further supporting the future income prospects for ag production is the stance of federal policy that has seemingly re-embraced ad hoc payments for broad-based market interruptions, thereby signaling continued and strengthened support for payments under the commodity title and crop insurance title. It is widely anticipated that the federal government will continue to push for environmental practice payments to farmers as well. Whether directly impactful or not, this policy represents a turning point in the conversation about the relationship between agricultural production and environmental benefits, rather than only focusing on negative externalities from production.

Finally, it is important to note that farmland tends to be owned for very long time periods and is often traded within families. Farm sizes are continuing to increase, due to natural economies of scale

and technological innovations that likewise favor scale. In the heart of the Corn Belt, historically only about 1.5% of farmland turns over per year, though there is limited evidence that this pace is increasing slightly. Thin market features support asset values, especially on the low side, and particularly in cases where the farmer represents the majority buyer. However, higher interest rates and uncertainty about eventual stabilization have significantly limited the ability to use debt in acquiring farmland given that the current income would not be expected to support the interest carrying cost even at reasonable leverage levels. These higher rates may limit the interest of institutional and absentee-investor buyers to some degree, but will also create pressure to compare total equity returns across competing asset classes. It would not be a surprise to see a bit of a pause in the farmland transactional markets as the Fed gets to its target rates

in 2023 and the relative return features are more completely understood.

This brief national overview was meant to provide baseline context for further details about important production regions around the country. In what follows, differences in the regional agricultural markets and typical operations (institutionally managed, lease type, etc.) are discussed and highlighted with implications for performance of farmland investments going forward. What is clear in any case is that advancements in information resources related to farmland market conditions will continue; and the resolution of market forces in the continued production of food for an increasingly large and affluent world population – while navigating the demands for climate-smart sustainable production – will give us food for thought about farmland markets for years to come.





# PACIFIC Market

## CALIFORNIA



# WEST

With its Mediterranean growing climate in the south, two major production valleys spanning several hundred miles, some of the best wine production regions in the world, and major row crop production as well,

### California is an agricultural powerhouse and global leader in food production.

More than 400 different commodities are produced in the Golden State, including over one-third of the nation's vegetables and three-quarters of the nation's fruits and nuts. California dairy farmers also produce almost 20% of the country's total dairy supply. With more than 40% of its annual production going to out of state and foreign markets, California is the nation's largest agricultural exporting state. Top commodity exports include tree nuts (almonds, pistachios, and walnuts), dairy and dairy products, and grapes and wine.

California has around 69,000 farming operations and generates about 12% of total U.S. agricultural cash receipts. Two

massive growing areas — the Salinas Valley and the Central Valley — produce almost all of the U.S. sourced lettuce, small vegetable, and fruit products found in the fresh produce aisle of grocery stores nationwide. California holds a dominant position (99% or more) in almonds, artichokes, celery, figs, garlic, grapes/raisins, kiwifruit, melons/honeydew, nectarines, olives, pistachios, peaches, other stonefruit, plums/prunes, walnuts, and many nursery crops and seed production. California is also the top milk producing state and is renowned for its wine production, with the Napa and Sonoma wine growing regions known worldwide.

Despite its crop diversification, strong land values and high production rates, California agriculture faces several significant challenges that will continue to impact the productivity and economic profitability of the state's agricultural sector. Farmers are navigating prolonged droughts, wildfires, farm labor shortages, and continued consumer pressures on agricultural

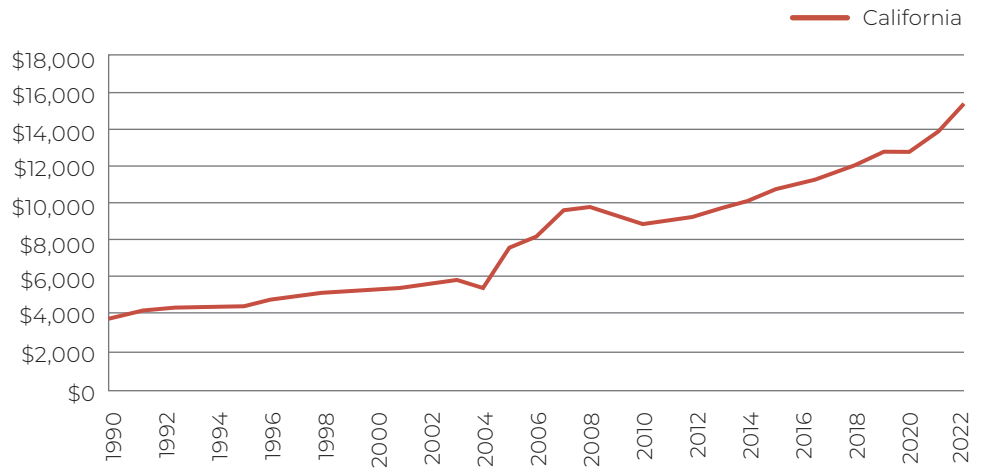
production systems. The state's relatively high cost of labor (minimum wage increased to \$15/hr in 2022) poses an additional challenge. With the highest number of hired and migrant workers in the nation, California ranks first for most workers per state at approximately 546,000 total. As labor represents approximately 70%-80% of variable costs for farmers, higher labor costs will make it increasingly difficult for California farmers to compete.

The largest concern, however, remains centered on agricultural water usage, which competes with water demands in high population areas in the downstate region. California's Sustainable Groundwater Management Act (SGMA – pronounced sigma) was passed in 2014 and places regulations on California farmers that impact water accessibility and usage in major geographic regions where tree nuts, citrus, and vegetable production occur. While the SGMA legislation was passed to protect the state's groundwater, the requirement that all basins achieve sustainability by 2024 has begun to materially affect

water usage, as well as impact land values almost exclusively based on the water use security embedded with the land. Additional land will need to be idled with water diverted to more valuable production areas, and crops that are more moveable or more water-price sensitive may be driven to other locations as SGMA is fully implemented. However, in California's key nut-producing regions, critical production areas will be difficult to relocate as water availability becomes a greater constraint. As a result, it is expected that land will experience relative revaluations based on access to and cost of water. In some areas, rental rates have already been materially influenced, and permanent crop acreages are already being managed based on expected access to future water resources.

The state has scrambled to develop and support additional water infrastructure, improve drought response, and bolster climate resilience through state-sponsored programs, but conflict inherent in SGMA between agriculture usage and urban requirements are not likely to be solved with state subsidies for lower intensity production. It is increasingly apparent that land with strong water rights and lower cost access to ground and surface water occupies a distinctly different class than land without associated or embedded water rights. "Farming the water" has become a phrase used to describe the value that can be gained by selling water usage like any other commodity.

## Price - \$/Acre Pacific West



### PACIFIC WEST CALIFORNIA

California Average	1990-2022	2000-2022	2010-2022
Income	3.79%	3.55%	2.86%
Capital Gain	4.81%	5.04%	3.95%
Total Return/Year	8.61%	8.60%	6.81%

### PACIFIC WEST CALIFORNIA SUMMARY

The California farmland market is massive and diverse. Historic market signals related to crop production have been based on unique climactic delineations, unique soils and growing conditions, and proximity to consumers and export channels. Increasingly, water access and cost will form fissures in the pricing landscape, as the reallocations necessary under SGMA come into full effect. Still, the scale and incredible diversity of its agricultural production guarantee that California will remain a critical player in not only its own, but also in competing regions' future fortunes. Institutional investors have historically focused on California due to access to large-scale operations with little production competition. It will be important to follow the moves of these and local investors as additional production system realignments occur.



# PACIFIC NORTHWEST *Market* —

The geographic diversity in the Pacific Northwest supports highly productive and incredibly diverse agricultural production. The region has developed a reputation for responsiveness to consumer preferences for differentiated production, including specialty formats or practices (e.g., sweet onions, creamer potatoes, local produce, organic production, sustainable practice farming, and the like). Being “closer” to the consumer and having more stable water resources and flexible production systems, the Pacific Northwest stands to absorb displaced production from regions that are expected to have water constraints in the near future.

**Lower farmland costs, adaptable production climates, and proximity to West Coast markets all bode well for future valuations in the Pacific Northwest region.**

Washington’s unique climate conditions, rich soils, better-than-average water resources, and large-scale irrigation allow the state to produce over 300 different crops across its more than 35,000 farm operations. The annual value of Washington’s agricultural production has grown to more than \$11 billion, with apples representing 21% of the state’s total value and 70% of the total U.S. production. In addition to apples, other top commodities for the state include milk, cattle, wheat, and potatoes.

Washington is also the top U.S. producer of blueberries, hops, pears, and sweet cherries, and it is the number two U.S. producer of apricots, asparagus, grapes, potatoes, and raspberries.

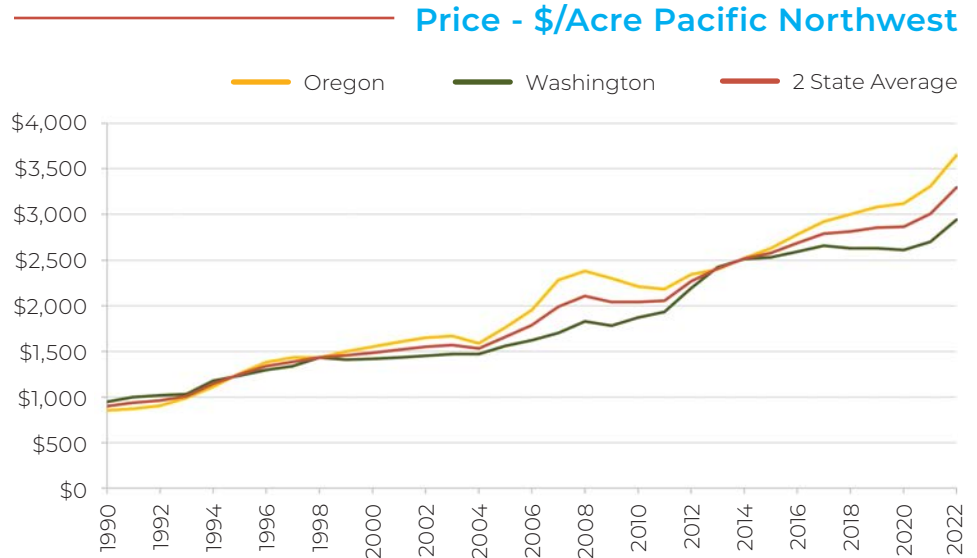
Although Oregon’s agricultural production value is about half that of Washington’s, the state also produces an incredibly diverse set of more than 220 crops over 16 million acres of production. Almost all of Oregon farms are family-owned, and 44% of Oregon producers are women. The top commodities produced in the state are hay, milk, wheat, potatoes, wine grapes, berries, hazelnuts, and pears. It is worth noting that Idaho, in a neighboring production region, directly competes with eastern Washington and Oregon with 25,000 farms and ranches that produce over 185 different commodities. Idaho is the top producer of potatoes in the U.S.,



growing approximately 7 million tons of potatoes with an annual value exceeding \$1.1 billion. In addition to potatoes, Idaho ranks first in the nation for production of barley, peppermint, and alfalfa hay. The state is also the second largest grower in the U.S. of sugar beets and hops, and Idaho is the third largest producer of cheese and milk.

Similar to California, large portions of the Pacific Northwest continue to experience drought conditions. As of September 19, 2022, the U.S. Drought Monitor classified more than 18% of land in the Western States as experiencing extreme or exceptional drought. Like other major agricultural regions, some parts of the Pacific Northwest face water supply constraints, but producers with access to the Columbia River water system and historic permitted wells hold a major advantage relative to those in other parts of the country. Approximately 6% of the Columbia River Basin's yearly runoff is used to irrigate 7.8 million acres of Pacific Northwest farmland. Hydropower from dams in the region ranks among the most affordable clean energy sources in the United States. This energy source enables farmers in Washington and Oregon to have an advantage over other states experiencing extreme drought, such as California, where growers can pay up to 10 times more for electricity to run their irrigation infrastructure.

The Pacific Northwest has become a particularly attractive region for farmland investors due to its relatively high historic returns, attractive future water



conditions, and access to large scale adjacent investments in packing and processing, providing incredible flexibility in production. Although 2022 included challenges for some

specific crops, land values continued the upturn in pace that began in 2021 but also exhibited a particularly smoother trend than on display in other row crop producing regions.

**PACIFIC NORTHWEST**

<b>2 State Average</b>	<b>1990-2022</b>	<b>2000-2022</b>	<b>2010-2022</b>
Income	6.47%	5.45%	5.42%
Capital Gain	4.83%	4.06%	3.68%
Total Return/Year	11.29%	9.51%	9.09%

**PACIFIC NORTHWEST SUMMARY**

The Pacific Northwest is in an attractive position to continue to absorb displaced production from other areas due to its flexibility in productive capacity, low energy and water resource costs, proximity to West Coast consumers, and increasing reputation as a supplier of vegetable crops, specialty crops, wine grapes, along with dominantly established hay, wheat, potatoes, dairy, apples, and seed production industries. These features and the view of the importance of agricultural production as bases of the states' economies bode well for the region's agricultural performance in the future.

# DELTA Market



Arkansas, Mississippi, and Louisiana form the Delta region, an area whose productivity and land values are generally stronger the nearer they are to the Mississippi River. The region typically has good to excess rainfall, as well as numerous groundwater resources in areas that are suited for irrigation. The Delta also tends to have larger farmland tracts and highly productive soils. Furthermore, the access to the river transportation system results in a much stronger basis than in areas where transportation costs to final markets are higher, though this year's barge traffic interruption due to low water levels created havoc across the board in terms of shipping costs.

The Delta region has a diverse agricultural landscape, ranging from corn, soybeans, and rice to sugarcane, cotton, and peanuts.

**However the Delta does suffer from higher weather risks, including periods of excessive heat and catastrophic excessive rainfall events that result in flooding and soil erosion.**

With production valued at nearly \$20 billion, Arkansas agriculture represents 14.5% of the state's economy, according to the University of Arkansas Division of Agriculture. Operating approximately 42,000 farms across 14 million acres, Arkansas is the top producer in the region. The state ranks first in U.S. rice production, producing nearly 50% of the nation's rice at a value close to \$1.3 billion; more than 60% of this rice is exported. Arkansas ranks third in cotton production, producing almost 8% of the U.S. crop. Other top

commodities produced in the state include soybeans and corn, valued at almost \$2 billion and \$825 million, respectively, in 2021, with final receipts in 2022 expected to be far higher.

Agriculture in Mississippi is an \$8.33 billion industry, employing over 17% of the state's workforce, according to the Mississippi Department of Agriculture & Commerce. There are approximately 34,000 farms in the state covering 10.4 million acres. Contributing \$1.5-2 billion in production value annually, soybeans are Mississippi's top producing crop, followed by corn, cotton, hay, sweet potatoes, and rice.

Louisiana is the second largest sugarcane producer in the U.S. behind Florida, with annual production of around 14.5 million tons worth nearly \$5 billion. The state's other top commodities include soybeans, corn, and rice. According to Louisiana's Department of Agriculture & Forestry, the state's agricultural and forestry industries contribute \$11.7 billion annually to its economy.

**Home to several of the most important food companies on the globe, the Delta has become an agricultural and agribusiness hub.**

Wal-Mart is the largest food retailer in the world, Tyson Food is the largest poultry and meat processor in the nation, and Riceland Foods

is America's largest rice exporter, sending products to more than 75 foreign destinations. Access to these off-takers and market makers allows integrated livestock and agricultural operations to thrive in the Delta.

Agriculture in the region has traditionally focused on traditional row crops, but there is a growing effort to organize large-scale vegetable operations and develop the infrastructure associated with vegetable and small format fruit production, bringing competition to other areas in the U.S. that are facing higher pressures from population growth and water scarcity.

Graphs of the annual price appreciation and annual income features of the region are quite tame in comparison to other regions. It has been noted that the Delta performs much like a throttled version of the Corn Belt, with similar but slower and somewhat more muted reactions to major market forces – on both the way up and down – resulting in lower return volatility than in other production regions.

**DELTA 3 State Average  
1990-2021**

Income	5.25%
Capital Gain	4.56%
Total Return/Year	9.81%

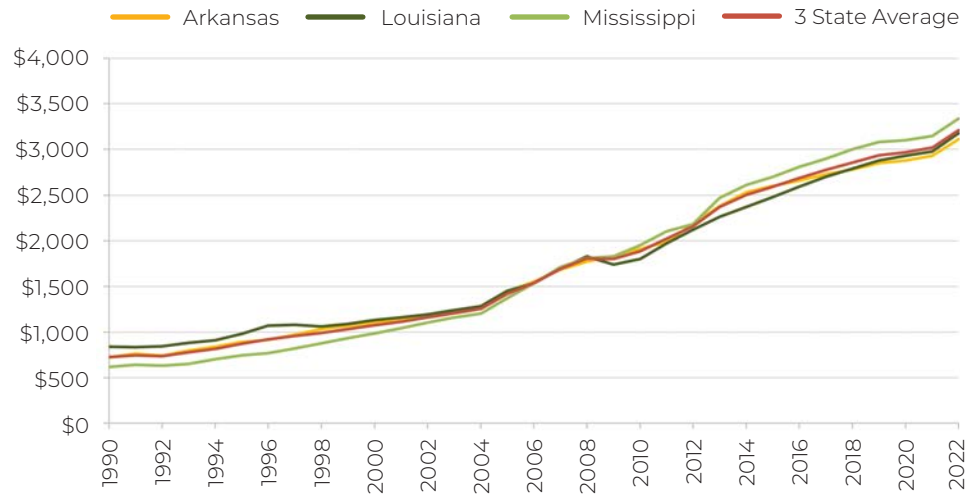
**2000-2021**

Income	4.59%
Capital Gain	4.79%
Total Return/Year	9.38%

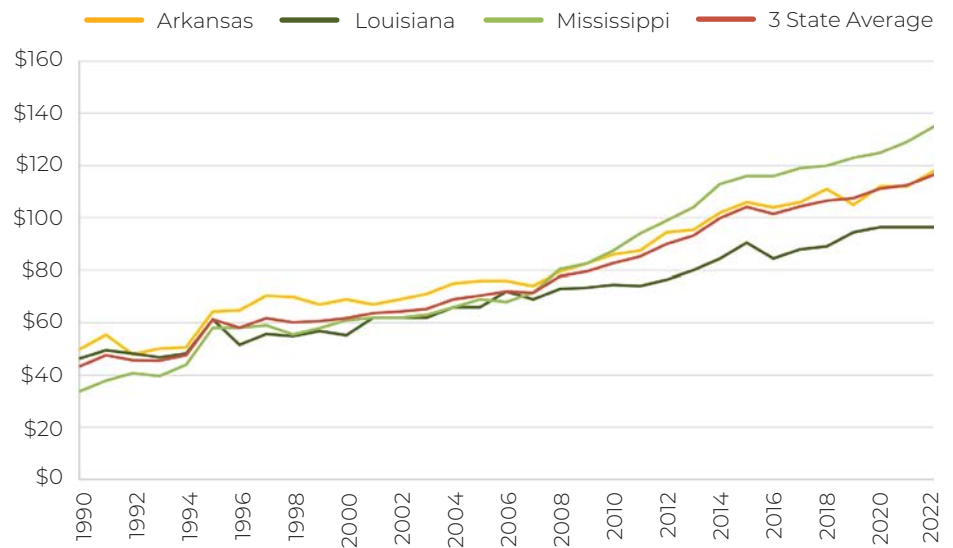
**2010-2021**

Income	4.03%
Capital Gain	4.20%
Total Return/Year	8.22%

**Price - \$/Acre Delta**



**Cash Rent - \$/Acre Delta**



**DELTA SUMMARY**

The Delta faces its own unique challenges, especially with regard to catastrophic weather events. But lower land costs, plentiful water, larger parcel size, and the opportunity to enhance profitability through capital expenditures and more sophisticated farming methods have attracted – and will continue to attract – the attention of investors in the region.



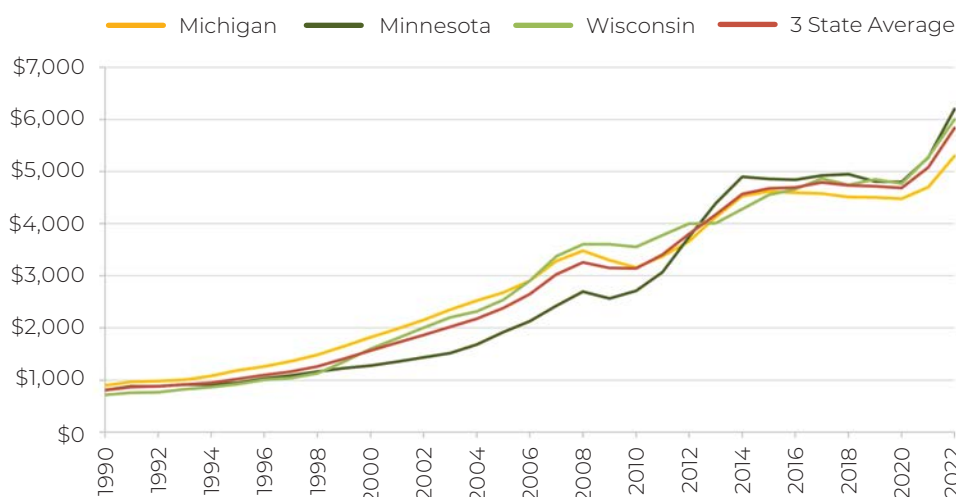
# LAKE Market

# STATES

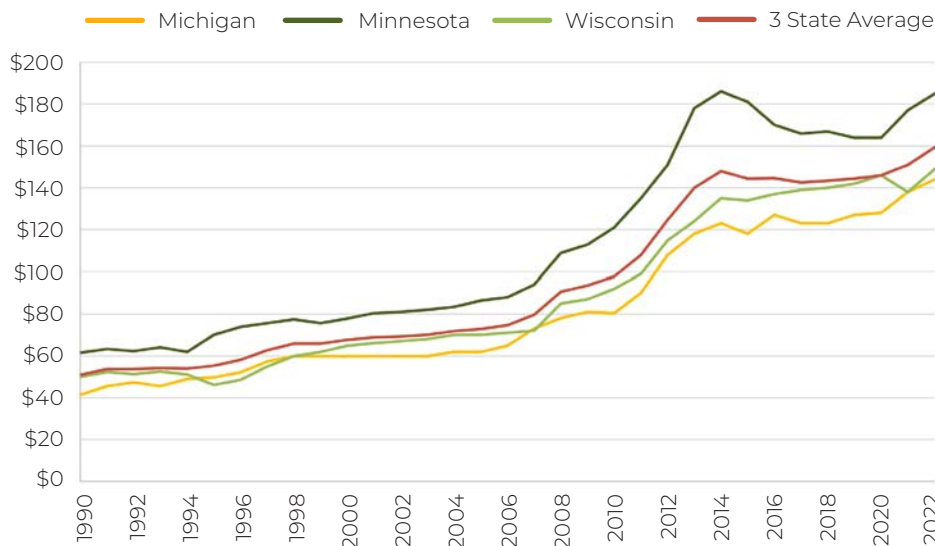


The Lake States region primarily includes Michigan, Minnesota, and Wisconsin. With its fertile land and waters, the region's annual agricultural production is valued at almost \$15 billion, accounting for approximately 7% of total U.S. food production and including 15% of the country's dairy. Michigan has the most varied production in the region, with areas of row crop production as well as large regions driven by stone fruit and berry/cherry production. Wisconsin has an agricultural history driven by dairy production and crops used to support livestock, but the concentration and emergence of large-scale dairies in the West and Southeast have led to consolidation of the dairy industry in the Lake States as well. The bottom rows of counties in Minnesota are nearly indistinguishable from neighboring areas in Northern Iowa. Minnesota state cash receipts from soybeans and corn rank third and fourth in the nation, respectively, behind Illinois and Iowa. Minnesota also has a mixture of dairy and livestock, as well as sugar beet and wheat producing regions in the northern part of the state.

Price - \$/Acre Lake States



Cash Rent - \$/Acre Lake States





With nearly 10 million acres of farmland and 46,000 farming operations, Michigan produces more than 300 different types of food and agricultural products. While the state's top producing crops are corn and soybeans, valued at \$1.9 billion and \$1.5 billion, respectively, in 2021, Michigan is more known for its specialty crops. The state is the leading producer in the world for Montmorency tart cherries and ranks fourth in the nation for sweet cherries. With more than 11.3 million apple trees in commercial production, Michigan ranks third in the nation in apple production, harvesting over 1 billion pounds of apples per year. The state is the sixth largest producer of milk and ranks second in the nation for the production of all dry beans. According to the Michigan Economic Development Corporation, the state is the leading U.S. producer of potatoes for potato chip processing. The diversity of agricultural real estate, low drought risk, and proximity to population centers make Michigan attractive to institutional investors.

Minnesota also has diverse agricultural production, with 67,400 farms operating on over

25 million acres. Row crops and livestock are produced in the southern tiers, cash grains in the west central, and sugar beets, wheat, and pulses (beans, lentils and peas) in the northwest. Minnesota's total agricultural production is typically over \$21 billion, ranking the state seventh in the U.S. Minnesota is a top producer of corn, soybeans, sugar beets, oats, turkeys, and wild rice.

Known as "America's Dairyland," Wisconsin is home to nearly 6,300 dairy farms. Its production of dairy products and milk ranks the state second in the U.S. behind California, with Wisconsin cheesemakers providing 25% of the nation's cheese – over 3.4 billion pounds annually. The entire dairy industry contributes over \$45 billion to the state's economy each year, according to the Wisconsin Department of Agriculture, Trade and Consumer

Protection. Wisconsin ranks first in the nation for snap beans for processing, cranberries, ginseng, dry whey for humans, milk goats, and corn for silage, and the state is one of the top producers of processing vegetables.

**Averaging over 12% each year, the return performance of agricultural investments in the Lake States has been phenomenal the past two years, with returns to farms in the NCREIF index topping 18% over the past year.**

Much of the recent return is in the form of appreciation, but the long-term performance has also been very stable despite the pause in appreciation during the 2015-2019 period, following a large price jump beginning in 2012.

#### LAKE STATES

3 State Average	1990-2022	2000-2022	2010-2022
Income	3.18%	2.67%	2.76%
Capital Gain	5.73%	5.35%	3.86%
Total Return/Year	8.91%	8.02%	6.61%

#### LAKE STATES SUMMARY

The Lake States farmland performance has benefitted from higher commodity prices and stable production through time, along with a ready demand for feed grains from the dairy and livestock industry. Row crop yields and prices are both lower, but proportional, to those in the Corn Belt, and financial performance for the two regions has been similar. The turnover in certain parts of the dairy belt is very low, providing a strong lower floor for land prices in the region.





# SOUTHEAST

## Market

---

The Southeast features distinct production regions with different types of agriculture and an array of pressures on land markets. Major production centers include Florida, Georgia, and North Carolina, with Alabama and South Carolina completing the region. While the warmer climate, flat land and water availability make the Southeast an attractive place to farm diversified crops, agricultural production in the region faces several challenges, including severe weather and

flooding, inadequate access to farm labor, and competition with residential uses for growing populations.

Florida's once thriving citrus industry has suffered through the Huanglongbing (HLB), or "Citrus Greening," crisis and now produces mainly juice oranges and some grapefruit. The state is still the top U.S. producer of fresh tomatoes, fresh sweet corn, and watermelon, representing about 54%, 36% and 32%, respectively,

of the nation's cash receipts for those crops. Florida also leads the country in the production of sugarcane for sugar, producing 16.5 million tons in 2021, or 51% of the nation's total. Other significant commodities include vegetables such as bell peppers, cucumbers, and cabbage, leading to the state having the second highest cash receipts in the U.S. for all vegetables and melons. Overall, Florida generates \$7-8 billion in agricultural sales each year.

Georgia's farm-level agricultural output is larger than Florida's at approximately \$9.45 billion annually. Representing 51% of the nation's peanuts market, the state produces around 3.3 billion pounds of peanuts annually, making it the top U.S. producer. Although Texas is now the country's top producer of cotton, Georgia still ranks second, producing 2.21 million 480-lb bales of cotton from 1.2 million acres. Georgia also ranks second in the nation's production of pecans, onions, and broilers (chickens), with shares of 33%, 14% and 13%, respectively, of the total cash receipts for those commodities. Despite being





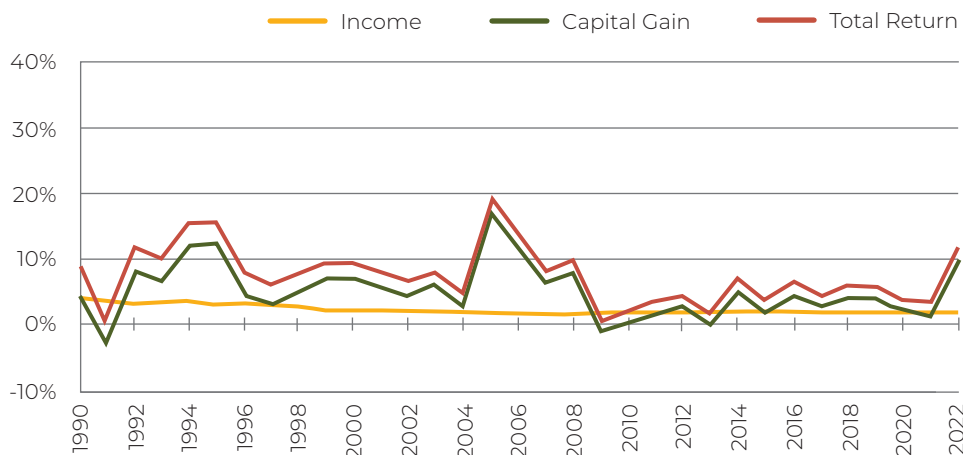
known as the “Peach State,” Georgia only has about 8,200 acres of peach production that accounts for about \$35 million in annual sales. Overall, the state accounts for 2% of total U.S. agricultural sales.

North Carolina’s agricultural production generates over \$10-13 billion in annual cash receipts, with 66% coming from livestock, dairy, and poultry, and the remainder from crops. The state ranks in the top five for several commodities, including tobacco, sweet potatoes, poultry & eggs, cucumbers, and bell peppers. North Carolina produced 47% of the nation’s tobacco and 58% of the country’s sweet potatoes in 2021.

Agribusiness is South Carolina’s largest economic sector, contributing nearly \$42 billion and over 200,000 jobs to its economy, according to the state’s Farm Bureau. In addition to having the third most timber acreage in the U.S., behind Georgia and Oregon, South Carolina operates approximately 25,000 farms across nearly 5 million acres of farmland. With the state’s top commodities including corn, cotton, hay, soybeans and peanuts, South Carolina generated almost \$6 billion in agricultural sales in 2021.

Alabama has 38,500 farming operations covering 8.2 million acres. Corn was the top commodity produced in the state in 2021, followed by cotton, which is grown in 59 of Alabama’s 67 counties. Producing almost 610 million pounds of peanuts in 2021, Alabama is the nation’s second largest producer behind Georgia.

## Returns - Southeast



Agricultural production is undergoing continued change in the Southeast, in particular in Florida and in coastal areas suitable for residential and lifestyle uses.

**Still, investors find the region friendly, with growing interest in the Carolinas as shifting crops and consolidating operations afford opportunity.**

### SOUTHEAST

5 State Average	1990-2022	2000-2022	2010-2022
Income	2.35%	1.92%	1.89%
Capital Gain	5.22%	4.80%	3.14%
Total Return/Year	7.56%	6.72%	5.02%

### SOUTHEAST SUMMARY

The Southeast remains a set of fairly distinct markets presenting different problems and opportunities for agricultural asset owners. Florida is still recovering from Hurricane Ian and reinventing its agricultural industry after the loss of much of its fresh-market citrus industry. On the bright side, planting houses and developing lifestyle communities has continued to support the state’s income. Georgia and the Carolinas have reentered the conversation about attractive places for agricultural investments and offer consolidation opportunities and diverse cropping options as well.



# CORN BELT

## Market

The Corn Belt describes the relatively homogenous production region across much of the Midwest, including Iowa, Illinois, Indiana, Ohio, and Missouri. Iowa and Illinois rank first and second, respectively, in the value of agricultural outputs in the region, and all five states rank in the top 13 nationally in terms of agricultural production value, with this year's total approaching \$100 billion in receipts across all commodities.

The Corn Belt has a long history with steady annual income that exceeds fixed income yields, as well as reliable but slightly more variable appreciation over time. Neighboring farmers are still the primary purchasers of farmland as economies of scale and natural growth of successful operations continue to consolidate farms, but institutional buyers are becoming more and more active through time. The long and relatively stable performance of the region had a bit of a pause from roughly 2015-2019, but then entered a historically high bull market run through the current period, with two successively

high rates of appreciation totaling 25-35% over much of the best regions in the Corn Belt.

Similar economic factors drive the farmland markets in the five states that comprise the Corn Belt. Table 1 summarizes the performance of the region at the individual state and aggregate NCREIF Corn Belt region level, which corresponds to the same five states. The ten-year treasury rate (TCM10Y) and the inflation rate (CPI) are provided for reference as well. The annual average return and standard deviation across the entire period provide a sense of the relative stability of farmland returns compared to equities (S&P 500) and to gold, which is sometimes viewed as an inflation hedging investment similar to farmland. More remarkable is the range of annual returns shown where the minimum annual return - or greatest one year loss - is a fraction of the potential drawdown experienced in equities or in gold.

**So what major factors are driving the Corn Belt farmland market?** A confluence of positive factors seems to have released both the supply side and demand side and resulted in ever higher transaction values. Of obvious impact has been the run-up in commodity prices driven in part by the Ukraine-Russia war, along with concerns over stocks-to-use levels tightening while world demand remains strong. As noted in the front piece, farmer balance sheets had been strengthening even before the increasing

TABLE 1 — Asset Return Characteristics 1991-2022

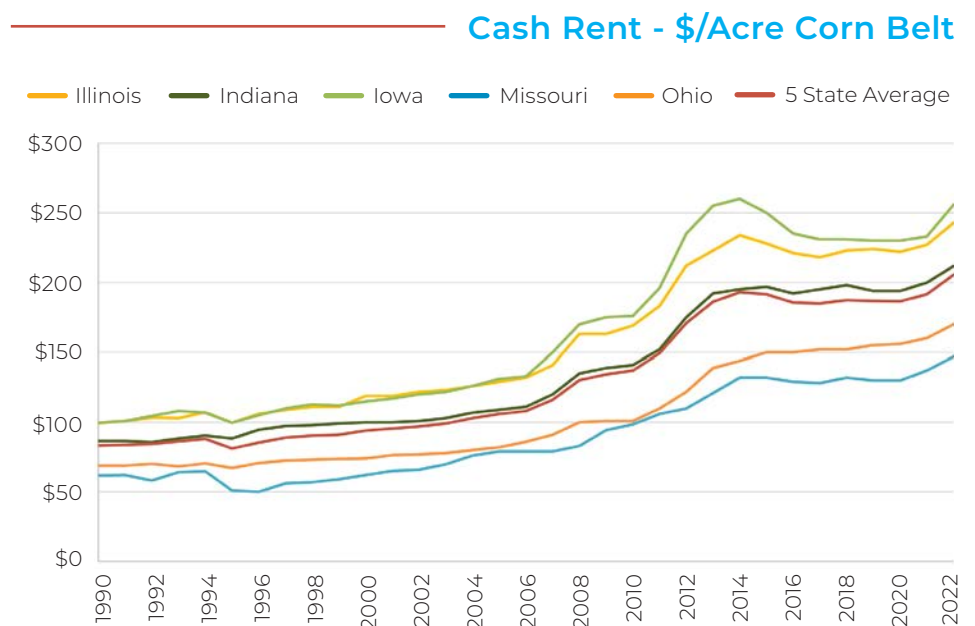
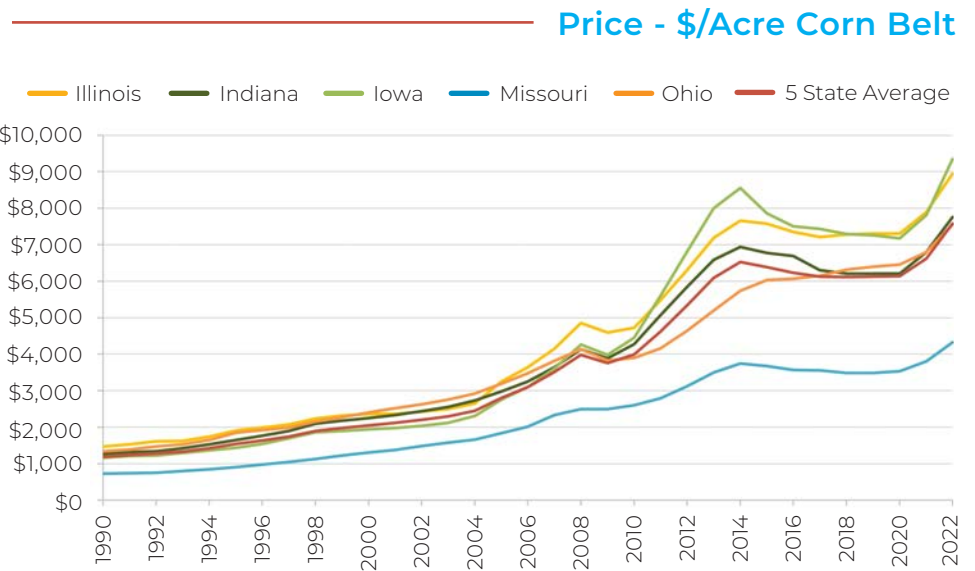
Asset/Index	Annual Avg. Return	Standard Deviation	Minimum Return	Maximum Return
NCREIF Corn Belt	10.6%	7.4%	-3.5%	26.3%
Illinois	9.4%	5.6%	0.8%	26.0%
Indiana	9.2%	5.0%	-1.0%	22.0%
Iowa	11.1%	7.4%	-5.3%	24.9%
Missouri	9.4%	4.1%	-2.9%	16.1%
Ohio	7.8%	3.6%	-3.3%	14.5%
S&P500	8.6%	16.8%	-48.6%	29.3%
TCM10Y	4.2%	1.9%	0.9%	7.9%
Gold	4.98%	14.0%	-31.9%	27.7%
CPI	2.51%	1.4%	0.1%	7.0%

commodity prices occurred, due to massive support payments and reasonable production costs. During the past year, however, input prices related to energy and fertility costs increased dramatically, though not at the same rate as total revenues for most producers in the region. Perhaps most importantly, interest rates that were low for much of the period when incomes were also relatively low have recently shot up, more than doubling the cost of newly borrowed long-term money in the span of only a year. Fortunately, low farmer leverage spared the sector from a direct and immediate impact, even as higher rates limited the interest of institutional buyers who typically carry more leverage than individual farmers. Finally, the prospects for continued higher commodity prices have begun to solidify, and the rationalization of expected inflation at new higher levels bodes well for long-term farmland prices as well.

On the rental side, cash rent accounts for about 60% of total acreage leased in the Midwest, and these lease arrangements are viewed as “sticky” for many reasons. The result to those outside the ag sector appears to be slow to respond, as rental rates tend to move less quickly than annual incomes, while still tracking well over the long term. Multiple factors account for the slowly moving rental rates. For one, owners do not like to switch operators, due to familiarity and non-pecuniary relationships that develop through time. Second, operators do not want

to deal with annual adjustments in locations and acreage farmed, and thus, longer term arrangements that smooth out short term economics tend to be reflected in rental markets. The pair of graphs below highlight the combined effects of these factors, showing the average aggregated values

of rental rates and farmland values by state in the Corn Belt. Focusing on the far right-hand portion of the graph, it is again apparent that movements in farm-level incomes are not directly mimicked in the rental prices, as is more common in other financial and non-agricultural real estate markets.

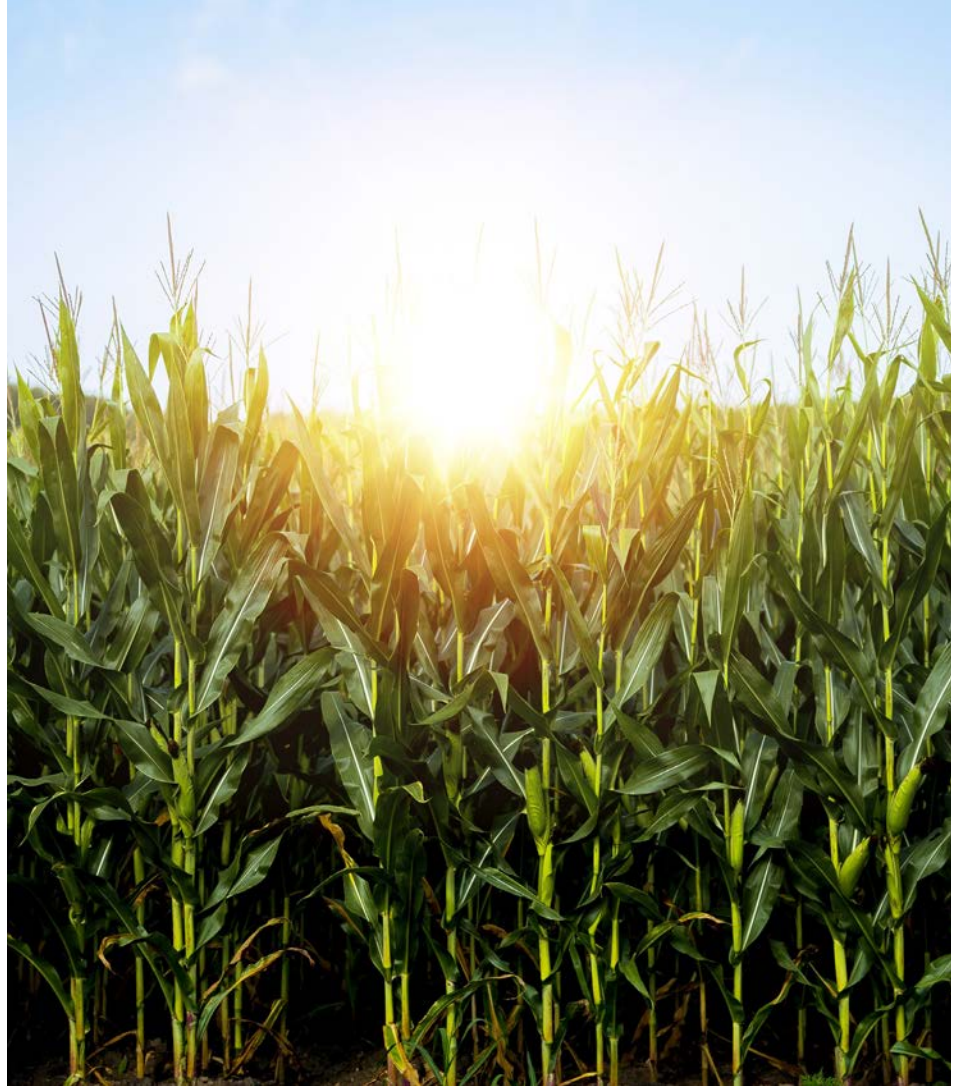




The volume of agricultural land brought to market in the region has been somewhat higher than normal over the past two years. As a general rule of thumb, about 1.5% of Corn Belt farmland changes hands at arm's length annually, but over the past 24 months, the turnover rate has approached 2%. While a 1/2% or .005 fractional change may not seem like a large increase, it does represent a 33.3% increase in the count of transactions. These numbers are rough and are expected to smooth through time, as periods with larger numbers of sales tend to be followed by periods with fewer sales, matching a normal ebb and flow in market conditions.

**It sometimes surprises investors to learn of the overall level of return generated through time by Midwest row crop agriculture.**

A natural response is to look for ways to add exposure to farmland in otherwise equity-heavy portfolios, to pick up the natural diversification effects and protection from inflation. As farmland is a slow-turnover, long-duration asset with higher acquisition and disposition costs than pure financial assets, it requires intentional and committed acquisition strategies to attain meaningful holdings. The Corn Belt has a great deal of historic and continuing interest by non-operating investors – a feature that is likely to continue and perhaps even accelerate, given the attractive return features of investments in the region.



**CORN BELT**

<b>5 State Average</b>	<b>1990-2022</b>	<b>2000-2022</b>	<b>2010-2022</b>
Income	4.27%	3.61%	3.10%
Capital Gain	5.86%	6.31%	5.49%
Total Return/Year	10.12%	9.91%	8.58%

**CORN BELT SUMMARY**

The Corn Belt anchors the traditional row crop production of the U.S. and thus in turn for the world. The region has emerged from the recent period of increased trade concerns and increased attendant government payments during the pandemic with considerable strength. Continued attendant strength in commodity pricing, supportive crop insurance programs, and strong export demand are competing with input costs and political instability, but the steady and competitive returns, inflation hedging, and diversification benefits in the Corn Belt region are nearly immutable.

# THE IRONY OF THE INFLATION REDUCTION ACT for THE FARMLAND ASSET CLASS



By **Dave Muth, PhD**  
Capital Markets - Managing Director, Asset Management  
Peoples Company

The Inflation Reduction Act of 2022 (IRA) was signed and became public law on August 16, 2022. There has been no shortage of political debate around whether the law would serve its namesake and broadly reduce inflation. However, it is clear the long-term policy objectives laid out in the IRA, if realized, will have significant inflationary impacts on the farmland asset class.

The primary spending provisions of the IRA are focused on energy security and climate change, with \$394 billion allocated to a range of programs over 10 years. Table 1 provides the breakdown of spending by economic sector. Although agriculture is directly allocated just over 5% of the funding, several of the programs in the Energy and Transportation and Electric Vehicles sectors directly impact agriculture, and farmland specifically.

The IRA has been at the forefront of discussions about spending priorities and policy direction. When considering how the IRA could be impactful for farmland, the legislation also needs to be analyzed in the context of two additional spending laws: 1) The U.S. Bipartisan Infrastructure Law (BIL), signed into law in November of 2021, and 2) The Creating Helpful Incentives to Produce Semiconductor and Science Act (CHIPS Act), signed into law in August of 2022. The BIL adds \$550B in new spending over 10 years, with

\$266B of that amount allocated to core U.S. infrastructure development, including the power grid, broadband, water, and environmental resiliency and remediation.<sup>[2]</sup> The CHIPS Act allocates \$278B in new spending over 10 years, directed at developing the U.S. semiconductor industry through manufacturing, R&D, and workforce development programs.<sup>[3]</sup>

The IRA is the flagship program establishing current U.S. leadership's policy initiatives to transition to a renewable energy and net zero emissions economy. The BIL and CHIPS Act provide additional direct funding to key programs that are viewed as essential for execution of these policy initiatives, particularly for renewable energy and electric vehicle production. In combination, the IRA, BIL, and CHIPS Act set a clear policy direction for a targeted future U.S. economy. This future, if realized, will have significant impacts on farmland values.

**TABLE 1** Inflation Reduction Act spending by sector.<sup>[1]</sup>

Energy	\$250.6B
Manufacturing	\$47.7B
Environment	\$46.4B
Transportation and Electric Vehicles	\$23.4B
Agriculture	\$20.9B
Water	\$4.7B
	<b>\$393.7B</b>

## IRA FUNDING IMPACTING AGRICULTURE AND FARMLAND

The IRA allocates nearly \$44B in funding which will directly impact agriculture and farmland.<sup>[4]</sup> This funding includes over \$20B for conservation programs and \$3.1B in farm debt relief, rural renewable energy tax credits, and biofuel tax credits. The direct funding allocated for agricultural programs represents one part of the IRA’s impact on farmland.

The current administration has established clear goals for a “carbon pollution-free power sector by 2035 and net zero emissions economy by no later than 2050.”<sup>[5]</sup> The combined programs of the IRA, BIL, and CHIPS Act are assembled to accelerate the U.S. economy toward these goals. This high-level policy goal, combined with the program infrastructure put in place through the IRA, represent several potential impacts for U.S. farmland.

## HOW DOES THE INFLATION REDUCTION ACT IMPACT FARMLAND VALUES

- Carbon sequestration and greenhouse gas emissions quantification
- Broad supply chain support for accelerating renewable electric generation capacity
- Extended and increased funding to conservation programs
- Renewable fuels and biofuels support

*Carbon sequestration* – The IRA allocates \$300M for quantification of soil carbon sequestration and greenhouse gas (GHG) emissions. These federal government initiatives will work in conjunction with significant private sector investment to facilitate credit payments for increasing carbon stored in farmland soils. The USDA programs funded through the IRA will work toward establishing baseline soil carbon quantification and valuation, with the goal of creating more stable and less discounted transactions in the emerging carbon marketplace.

The policy goals of a “net zero” U.S. economy, as established through the IRA, require significant carbon sequestration in farmland soils. Identifying the true potential

of soil carbon sequestration across the nation’s 396M acres of cropland is challenging. Let us consider scenarios based on current estimates.

Utilizing current USDA planning tools, best estimates are that over 200M metric tons (MT) of carbon can be sequestered annually through broad adoption of reduced tillage and cover cropping practices.<sup>[6]</sup> Table 2 calculates the impact to farmland values at three carbon market price points, assuming a broad average of a 3.5% cap rate for U.S. farmland. Assuming 200M MT of carbon sequestration and a carbon value market of \$60/ton would create over \$340B in additional value for U.S. farmland, representing a nearly 10% increase in total asset class value.

**TABLE 2** Scenarios describing impact on farmland values from carbon sequestration and credit sales.

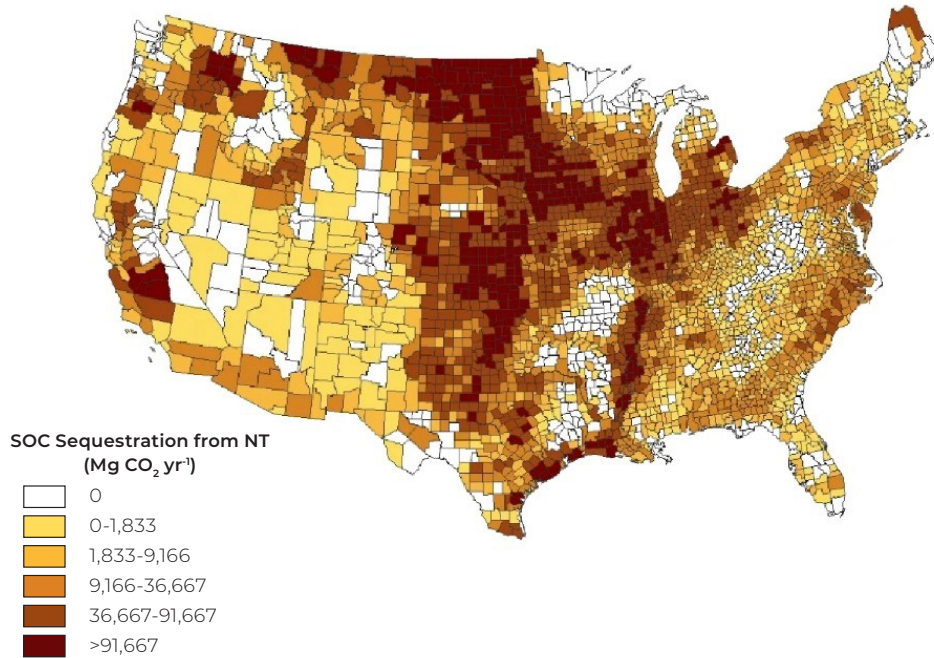
	Value Per MT Carbon		
	\$30	\$60	\$90
Annual Carbon Sequestered (MT)	200,000,000	200,000,000	200,000,000
Total Annual Value	\$6,000,000,000	\$12,000,000,000	\$18,000,000,000
U.S. Farmland Cap Rate	3.5%	3.5%	3.5%
<b>U.S. Farmland Value Impact</b>	<b>\$171,428,571,429</b>	<b>\$342,857,142,857</b>	<b>\$514,285,714,286</b>





**FIGURE 1 Sequestration Potential Map**

Source: Carbon Balance and Management Journal, Biomed Central.<sup>[7]</sup>



**TABLE 3 Evaluation of potential farmland value impact from wind turbine installation, based on requirements established in the Net Zero America study with 100% renewable electrical generation.<sup>[8]</sup>**

Installed wind generation capacity (TW)	3.07
MW produced per wind turbine	2.75
Total turbines installed	1,116,364
Percentage of turbines installed on farmland (estimated)	80%
Total turbines installed on farmland	893,091
Average annual lease rate per farmland turbine	\$10,000
Total farmland turbine revenue generated	\$8,930,909,091
Cap rate assumption for turbine revenue	6.0%
Total farmland value impact	\$148,848,484,848

*Renewable/Carbon Free Electric Generation* – The IRA provides the policy framework for a “carbon pollution-free power sector by 2035.” This initiative is very aggressive and will require substantial scale-up of renewable electric generation. The Net Zero America study developed at Princeton University<sup>[8]</sup> develops scenarios based on five approaches to decarbonization, with the goal of a net zero emissions U.S. economy by 2050. For illustrative purposes, Table 3 utilizes the analysis results from the Net Zero America scenario that is constrained to 100% renewable electricity production, so as to look specifically at the farmland impact of wind power generation. This scenario includes several illustrative assumptions including what percentage of the capacity is installed on farmland, the lease rate per turbine, and the capitalization rates used to calculate value from the turbine lease revenue. The set of assumptions in Table 3 identifies nearly \$150B in added value to farmland.



The Net Zero America study projects 2.75 TW of installed solar capacity in the 100% renewable electricity production scenario. Unlike wind, solar installations represent a land use change from current agricultural production. The overlap of solar installation with farmland is likely to include areas that face productivity challenges, including future water availability constraints on currently irrigated farmland. This rapid increase in solar capacity will provide additional revenue to farmland nationally but would fundamentally shift the land use from agricultural production to energy.

**REGIONAL IMPACTS**

Figure 2 provides a geographic analysis of the required wind and solar installations from the Net Zero America study. Figures 1 and 2 highlight U.S. farmland regions that could

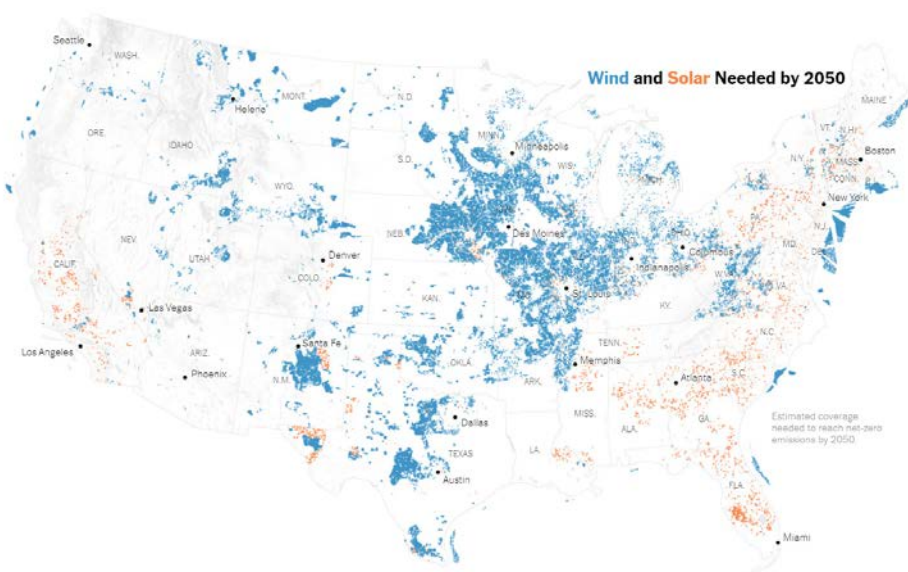
see disproportionate impact if the IRA policy goals are fully realized. The Corn Belt presents the most significant carbon and wind energy opportunities. This region will receive proportionally high increases in revenue, and subsequently larger increases in farmland values if the IRA policy goals are realized.

*Conservation programs* – The \$20.9B funding increases to existing and new USDA conservation programs impacts farmland values in three primary ways: 1) several of the programs deliver cash payments for conservation practices, adding revenue to the farmland operations; 2) additional program dollars fund farmland improvements, impacting long term function and value; and 3) significant R&D is funded to develop practices and methods that increase productivity within conservation management systems. The R&D funding is

perhaps the most significant, as new programs are being developed to quantify soil carbon sequestration and support the market in placing value on ecosystem services provided by farmland. If these programs create clear and concise methodologies to the market, then the soil carbon opportunity described previously can be accelerated and realize more of the value potential.

*Biofuels incentives* – The policy goal of a net zero emissions U.S. economy by 2050 will require liquid fuels from non-fossil fuel sources. Aviation, agriculture, and heavy transport are examples of industries that will rely on liquid fuels for the foreseeable future. The IRA extended several tax credits incentivizing biofuel production. The net zero policy framework envisions a significant shift in biofuel production. Currently, ethanol is the dominate biofuel, and corn-based ethanol has had a significant positive impact on farmland values through the Corn Belt region. Electrification of the passenger vehicle fleet, a primary current policy goal, will reduce demand for corn-based ethanol. However, achieving the net zero goals will require significant growth in renewable diesel and sustainable aviation fuel (SAF) production.

**FIGURE 2** Net Zero America study geographic analysis of wind and solar installations required in 2050 under the 100% renewable electric generation scenario.<sup>[9]</sup>







outcomes of the spending and incentive programs are uncertain. However, the IRA sets a policy path with several potential positive outcomes for farmland values: 1) significant revenue increases from carbon sequestration and ecosystem services provided; 2) significant revenue increases from renewable energy production; 3) increased funding which, in turn, drives land improvements and conservation practice funding; and 4) increased role of farmland in the U.S. energy sector through additional biofuel production. All these outcomes expand the current U.S. farmland revenue base and create additional value. The Inflation Reduction Act is clearly an ironic name when evaluating the long-term impacts on farmland values.

Table 4 provides the scale of current ethanol capacity relative to the renewable diesel and SAF production needed to meet policy goals. The aggregate use of biofuels will increase to meet current net zero targets, with the IRA providing incentives to advance that goal. While the impact on national farmland values will be a net positive,

the scale and regionality of that impact will emerge as renewable diesel and SAF production is developed.

The Inflation Reduction Act of 2022 provides a clear picture of policy objectives for U.S. energy production and climate change responses. Like all policy initiatives, the ultimate

**TABLE 4** Scale of ethanol production vs diesel and aviation fuel consumption in the U.S.

Current U.S. fuel ethanol plant capacity (MMgal/year) <sup>[9]</sup>	<b>17,380</b>
U.S. transportation sector 2021 diesel consumption (MMgal) <sup>[10]</sup>	<b>46,820</b>
U.S. total airlines 2019 aviation fuel consumption (MMgal) <sup>[11]</sup>	<b>26,674</b>

**References:**

[1] Kumar, Adi, et al. "The Inflation Reduction Act: Here's What's in It." *McKinsey & Company*, McKinsey & Company, 26 Oct. 2022, <https://www.mckinsey.com/industries/public-and-social-sector/our-insights/the-inflation-reduction-act-heres-whats-in-it>.

[2] "The U.S. Bipartisan Infrastructure Law: Breaking It Down." *McKinsey & Company*, McKinsey & Company, 16 Feb. 2022, <https://www.mckinsey.com/industries/public-and-social-sector/our-insights/the-us-bipartisan-infrastructure-law-breaking-it-down>.

[3] Badlam, Justin, et al. "The Chips and Science Act: Here's What's in It." *McKinsey & Company*, McKinsey & Company, 6 Oct. 2022, <https://www.mckinsey.com/industries/public-and-social-sector/our-insights/the-chips-and-science-act-heres-whats-in-it>.

[4] Bynum, Lee. "Reviewing the Inflation Reduction Act of 2022; Part 1." *Farmdoc Daily*, 17 Aug. 2022, <https://farmdocdaily.illinois.edu/2022/08/reviewing-the-inflation-reduction-act-of-2022-part-1.html>.

[5] "Fact Sheet: President Biden Sets 2030 Greenhouse Gas Pollution Reduction Target Aimed at Creating Good-Paying Union Jobs and Securing U.S. Leadership on Clean Energy Technologies." *The White House*, The United States Government, 22 Apr. 2021, <https://www.whitehouse.gov/briefing-room/statements-releases/2021/04/22/fact-sheet-president-biden-sets-2030-greenhouse-gas-pollution-reduction-target-aimed-at-creating-good-paying-union-jobs-and-securing-u-s-leadership-on-clean-energy-technologies/>.

[6] "Opportunities and Challenges Associated with 'Carbon Farming' for U.S. Row-Crop Producers." *Center for Commercial Agriculture*, 1 July 2021, <https://ag.purdue.edu/commercialag/home/resource/2021/06/opportunities-and-challenges-associated-with-carbon-farming-for-u-s-row-crop-producers/>.

[7] Sperow, Mark. "What Might It Cost to Increase Soil Organic Carbon Using No-till on U.S. Cropland? - Carbon Balance and Management." *BioMed Central*, Springer International Publishing, 5 Dec. 2020, <https://cbmjournal.biomedcentral.com/articles/10.1186/s13021-020-00162-3#Fig2>.

[8] America, Net-Zero. "Net-Zero America Project." *Princeton University*, The Trustees of Princeton University, <https://netzeroamerica.princeton.edu/the-report>.

[9] "U.S. Fuel Ethanol Plant Production Capacity." *U.S. Energy Information Administration*, 8 August 2022. <https://www.eia.gov/petroleum/ethanolcapacity/>

[10] "Diesel Fuel Explained." *U.S. Energy Information Administration*, 6 July 2022. <https://www.eia.gov/energyexplained/diesel-fuel/use-of-diesel.php>

[11] "Less Production and More Demand Have Reduced U.S. Jet Fuel Inventories." *U.S. Energy Information Administration*, 31 December 2021. <https://www.eia.gov/todayinenergy/detail.php?id=50627>



# TRACKING THE PERFORMANCE of FARMLAND INVESTMENTS:

## The National Council of Real Estate Investment Fiduciaries (NCREIF) Farmland Index

Most financial assets can be traded in near real time with low transaction costs and high frequency price information due to the homogeneity of shares of a firm. One share of Amazon stock, for example, is exactly the same as any other, so only one price and one income measure is needed to fully understand its performance. Farmland is unique in that, unlike equities, each parcel has distinctive qualities, and regions differ in their predominant crop type and management practice. Row crops and permanent crops are likely to involve very different lease types and have different cost and returns structures. The prevalence of cash accounting at the farm level also creates difficulty in tracking certain periodic measures of performance, and the long-term nature of farmland makes trading in and out, or rebalancing a portfolio, difficult for an individual.

There are many sources of information about farmland values, including those from surveys and tracking projects often conducted at universities; by professional societies, such as the American Society of Farm Managers and Rural Appraisers; or the

USDA. These sources often rely on surveys or thin market trades and often are intended to represent the universe of farmland rather than the portion that is managed for profit in commercial scale sized units. While incredibly valuable, these sources serve a slightly different purpose than needed by an investor seeking accurate information about returns they might earn from an investment into a diversified holding of farmland.

**However, the National Council of Real Estate Investment Fiduciaries (NCREIF) provides an attractive alternative that has particularly useful features for understanding the performance of the asset class by region, crop type, and management type.**

NCREIF is most well-known for its family of commercial real estate fund indexes, but also produces indexes for timberland and farmland investments. The NCREIF Farmland data were first made available in 1991 and are reported using a consistent accounting system across all contributing members,

with data tracked by location, property type, and management type (e.g., direct operation versus cash lease). The properties in the system are each regularly appraised under specific and complete guidelines which are intended to provide an accurate mark-to-market valuation each quarter. The index contains only commercial scale properties in active agricultural production, and all returns are reported on an unlevered basis, to allow a direct assessment of property-level performance on a common base.

As of third quarter 2022, the total market value of the index was \$13.9 billion, comprised of \$9.08 billion in annual cropland and \$5.78 billion in permanent cropland across a total of 1,306 properties, across 11 different production regions. Importantly, the index focuses on commercial scale operations and has historically shown higher rates of return across the board than measures derived from USDA sources, which include a much broader set of farm types and sizes.

For more information visit [ncreif.org/data-products/farmland/](https://ncreif.org/data-products/farmland/)

The table below provides returns by state and identifies the NCREIF region within which each state is contained. The relatively stable patterns that emerge over the long run are for the most part highly consistent with the underlying risk and return of the cropping region and farming practices.

### State and Regional Returns Over Various Holding Periods

State	Region	1-Year	5-Years	10-Years	15-Years	20-Years	25-Years
Alabama	Southeast	3.1%	4.7%	5.1%	4.5%	5.1%	5.4%
Arizona	Mountain	5.3%	5.7%	5.3%	4.5%	8.0%	8.6%
Arkansas	Delta	4.7%	6.1%	6.6%	6.8%	8.7%	9.2%
California	Pacific West	10.5%	8.1%	7.9%	7.0%	9.0%	9.4%
Colorado	Mountain	4.5%	6.0%	7.5%	6.5%	8.5%	8.7%
Delaware	Northeast	5.0%	4.6%	2.9%	0.4%	5.8%	6.4%
Florida	Southeast	3.5%	3.7%	3.7%	2.4%	5.4%	5.3%
Georgia	Southeast	8.1%	5.3%	5.0%	2.0%	5.7%	6.6%
Idaho	Mountain	11.1%	9.9%	9.6%	6.9%	9.8%	10.1%
Illinois	Corn Belt	9.2%	7.0%	6.3%	8.1%	9.6%	9.2%
Indiana	Corn Belt	9.9%	6.6%	5.7%	7.9%	8.6%	8.8%
Iowa	Corn Belt	11.8%	7.7%	6.4%	9.8%	11.2%	10.7%
Kansas	Northern Plains	12.3%	9.0%	7.9%	9.3%	10.1%	9.7%
Kentucky	Appalachia	5.0%	6.4%	7.5%	6.2%	7.4%	7.8%
Louisiana	Delta	5.0%	5.9%	6.6%	7.0%	7.8%	8.0%
Maryland	Northeast	8.0%	5.9%	4.6%	1.8%	5.2%	5.4%
Michigan	Lake	9.1%	5.5%	6.1%	4.9%	6.2%	7.3%
Minnesota	Lake	10.8%	7.4%	7.9%	8.7%	10.5%	10.7%
Mississippi	Delta	5.1%	6.1%	6.6%	6.6%	8.0%	8.8%
Missouri	Corn Belt	11.8%	9.0%	7.5%	7.6%	8.9%	9.2%
Montana	Mountain	4.8%	5.3%	6.0%	4.5%	8.3%	8.5%
Nebraska	Northern Plains	13.7%	9.0%	7.7%	11.6%	12.2%	11.9%
New Jersey	Northeast	5.4%	2.6%	2.0%	-0.4%	2.7%	2.9%
New York	Northeast	5.0%	3.1%	3.8%	4.0%	4.8%	5.1%
North Carolina	Appalachia	3.4%	4.0%	3.3%	2.6%	4.2%	5.2%
North Dakota	Northern Plains	9.1%	6.6%	8.9%	11.2%	12.2%	11.4%
Ohio	Corn Belt	5.6%	5.4%	6.3%	6.4%	7.0%	7.4%
Oklahoma	Southern Plains	8.1%	6.6%	6.6%	6.8%	8.2%	8.0%
Oregon	Pacific Northwest	14.9%	9.8%	9.2%	8.7%	9.8%	9.6%
Pennsylvania	Northeast	3.6%	4.6%	3.9%	3.1%	4.5%	5.1%
South Carolina	Southeast	4.1%	4.4%	3.6%	3.2%	4.6%	5.2%
South Dakota	Northern Plains	11.8%	7.5%	9.9%	11.6%	12.8%	12.6%
Tennessee	Appalachia	6.1%	6.3%	5.2%	4.7%	5.8%	6.4%
Texas	Southern Plains	10.9%	8.1%	6.3%	6.2%	8.1%	8.4%
Utah	Mountain	8.3%	6.2%	6.1%	4.9%	6.8%	7.0%
Virginia	Appalachia	2.6%	3.0%	2.6%	1.0%	4.3%	4.9%
Washington	Pacific Northwest	12.8%	9.7%	10.5%	11.0%	12.6%	12.9%
West Virginia	Appalachia	3.3%	3.5%	2.5%	2.5%	4.8%	5.1%
Wisconsin	Lake	8.9%	5.4%	5.6%	5.2%	7.0%	8.6%



12119 Stratford Drive | Clive, IA 50325  
855.800.LAND | Info@PeoplesCompany.com

[PEOPLESCOMPANY.com](http://PEOPLESCOMPANY.com)

