

Ag Decision Maker

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UPDATES

The following [Information Files](#) have been updated on extension.iastate.edu/agdm:

A1-34 Corn and Soybean Commodity Loan Rates

C5-10 Peter Drucker and Innovation

The following [Video and Decision Tools](#) have been updated on extension.iastate.edu/agdm:

A1-10 Chad Hart's Latest Ag Outlook

C2-01 Estimated Returns by Farm Lease Agreement

C2-30 Crop Share Lease Analysis

C2-87 Calculating a Weighted Average Corn Suitability Rating 2

C3-56 Comprehensive Financial Statements

The following [Profitability Tools](#) have been updated on extension.iastate.edu/agdm/outlook.html:

A1-85 Corn Profitability

A1-86 Soybean Profitability

A2-11 Iowa Cash Corn and Soybean Prices

A2-15 Season Average Price Calculator

D1-10 Ethanol Profitability

D1-15 Biodiesel Profitability



Farmland values, cash rents surge in 2022

By Lee Schulz, extension livestock economist
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For a decade, low mortgage rates and surging house values made home buying an outstanding investment. From July 2021 to July 2022, house prices in Iowa rose 10.4%. But houses have nothing on skyrocketing cropland prices. From 2021 to 2022, based on survey data gathered by USDA's National Agricultural Statistics Service, Iowa cropland surged 19.7%, from \$7,810 per acre in 2021 to \$9,350 per acre in 2022 (Figure 1).

The \$9,350 per acre average is a record for Iowa. The 19.7% bump for 2022 is the highest annual

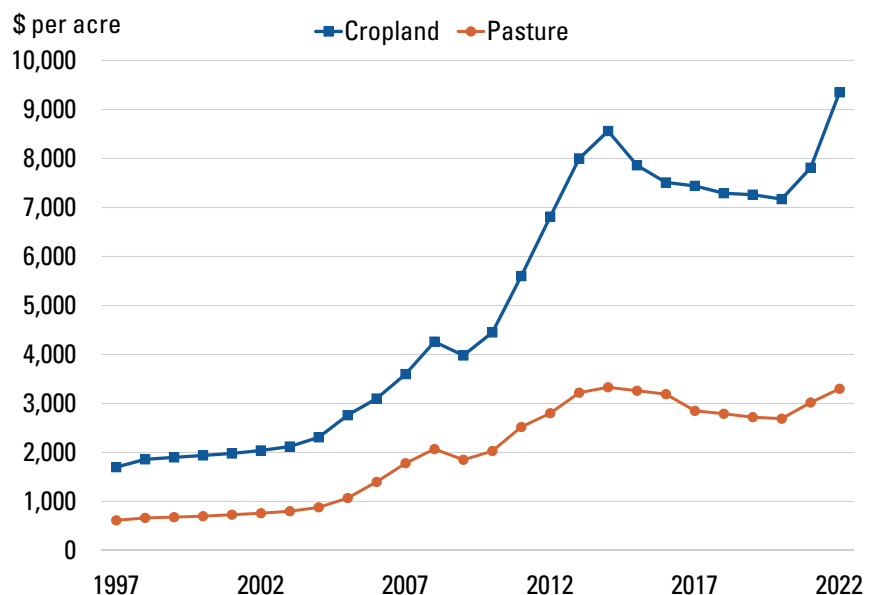
jump in Iowa cropland value in USDA's survey since 2011 and 2012.

Iowa's pasture value in 2022 averaged \$3,300 per acre, up 9.3% from 2021. The \$3,300 per acre value was slightly below the record 2014 value of \$3,330 per acre. Over time, pasture values tend to follow cattle and corn prices.

Comparison to 2011 surge

In 2011, the US economy was growing. Gross domestic product rose 3.7% for the year. This compared to an annual growth rate of 2.0% for 2008, -2.0% for

Figure 1. Iowa cropland and pasture value. Data source: USDA-NASS.



2009, 3.9% for 2010 and 4.2% for 2012. The Consumer Price Index (CPI) during 2011 climbed 3.2%. The unemployment rate leveled off during the year and declined as the year ended. Value of agricultural sector production climbed from \$344.1 billion in 2010 to \$410.0 billion in 2011, up 19.1%, compared to an 11.5% rise for manufacturing.

The 2022 general economy is more anemic. Inflation is around 8.5%, which could buoy land values. Potential for a steeper economic slowdown could dampen interest in buying land. Rising interest rates and any slippage in net farm income could erode farmers' ability to service land debt.

Net farm income (NFI) measures profitability. NFI accounts for the return to farm operators for their labor, management and capital after total production expenses have been paid. In 2011, NFI was up 47.3% from 2010 according to USDA's Economic Research Service (Figure 2). Looking back from today, 2011 had the third highest inflation-adjusted value of net farm income since 1973. Only 2013 and 2021 were higher.

In nominal terms, 2022 NFI is forecasted to be record high. But after adjusting for inflation, NFI is forecasted to be similar to 2011.

Cash rents climb higher

In August, NASS released results of its [annual cash rent survey](http://www.nass.usda.gov/Statistics_by_State/Iowa/Publications/Economics/2022/IA-Cash-Rent-Land-Values-08-22.pdf), www.nass.usda.gov/Statistics_by_State/Iowa/Publications/Economics/2022/IA-Cash-Rent-Land-Values-08-22.pdf.

Figure 2. US net farm income. Data source: USDA-ERS.

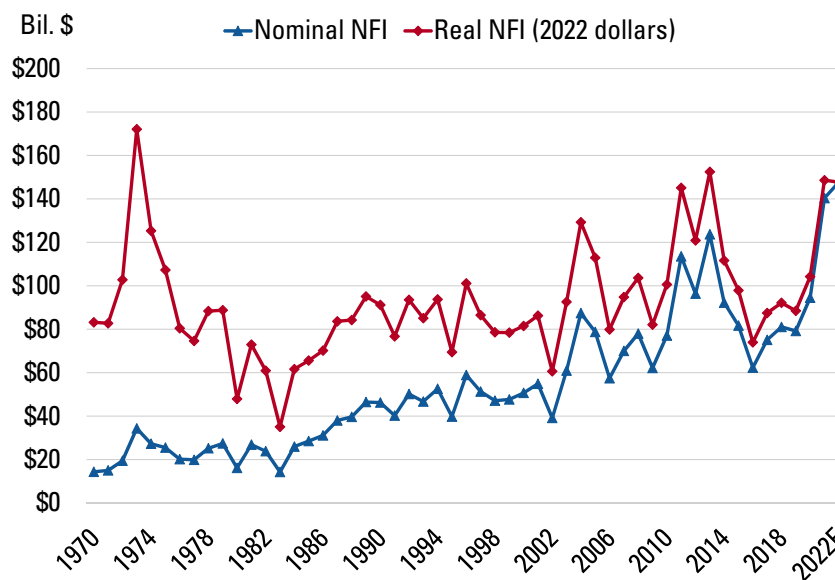
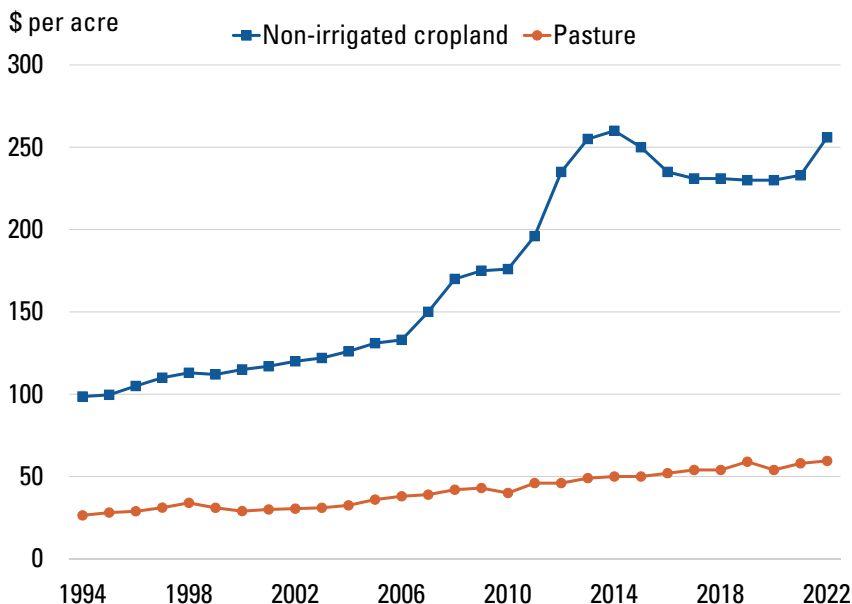


Figure 3. Iowa non-irrigated cropland and pasture cash rental rate. Source: USDA-NASS.



The results provide state and county estimates of cash rent paid for irrigated cropland, non-irrigated cropland and pasture. NASS excludes land rented for a share of the crop, on a fee per head, per pound of gain, by animal unit month, rented free of charge, or land that includes buildings such as barns from survey results.

Non-irrigated cropland cash rent averaged \$256 per acre in Iowa during 2022, \$23.00 per acre or 9.9% higher than in 2021 (Figure 3). This average cash rent was still lower than the 2014 record of \$260 per acre. Grundy County Iowa had the highest 2022 cash rent for non-irrigated cropland at \$304 per acre, followed by Sioux County at \$295 per acre. Ida, Black Hawk and Bremer rounded out the top five counties. Davis County, at \$154 per acre, had the lowest average cash rent for non-irrigated cropland.

Recognize that soil quality, field size, topography, drainage, existing relationships between parties, demand for nutrient management purposes and other factors can result in cash rental rates ranging widely, even within a county.

In 2022, Iowa pasture cash rent averaged \$59.50 per acre. This was \$1.50 per acre or 2.6% above 2021 and a record high. Sioux County had the highest published pasture cash rent at \$83.00 per acre, followed by Page and Shelby counties at \$81.00 per acre. Louisa County had the lowest pasture cash rent at \$28.00 per acre.

Pasture cash rental rates typically vary based on forage quantity and quality, forage species and composition, existence and condition of fencing, water quality and availability, management practices required by the landowner, among many other factors.

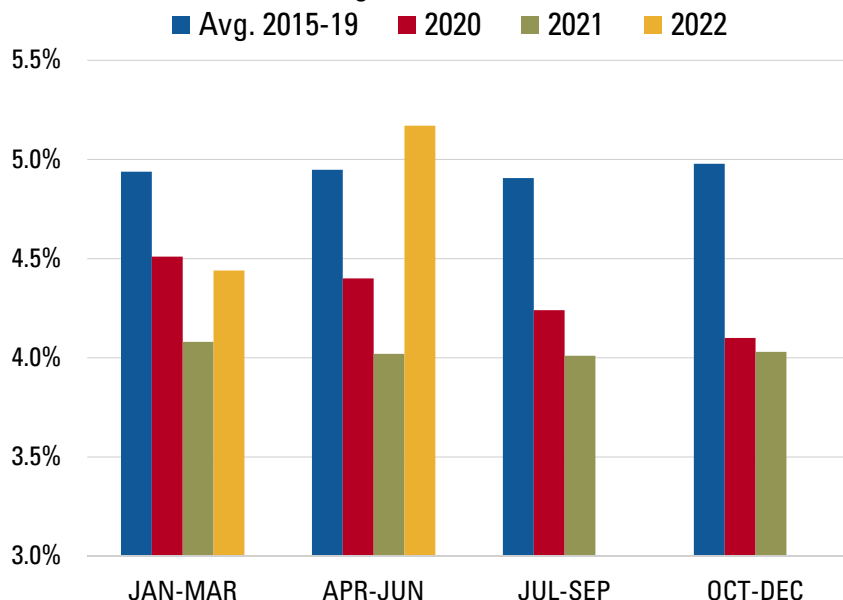
Higher interest rate is a damper

The Federal Reserve has affirmed it will forcefully use its monetary policy tools, including higher interest rates, to attack inflation.

However, bringing down inflation has costs. Farming is a capital-intensive industry. Many farmers extensively use borrowed funds. All else equal, higher interest rates boost expenses and trim farm profit.

Interest rates can also have a profound impact on the value of land and the ability of cash

Figure 4. Seventh district farm real estate loan interest rates. Data source: Federal Reserve Bank of Chicago. Seventh district is made up of Iowa, most of Illinois, Indiana, Michigan and Wisconsin.



rented land to produce income to pay rent.

The [Federal Reserve Bank of Chicago](http://www.chicagofed.org/publications/agletter/index), www.chicagofed.org/publications/agletter/index, publishes average farm real estate loan interest rates for the seventh district made up of Iowa, most of Illinois, Indiana, Michigan and Wisconsin. The rate for the second quarter of 2022 was 5.17%, up from 4.44% in the first quarter of 2022 (Figure 4). A year ago rates were 4.02%.

Land's earning trends

One way to evaluate land as an investment is to simply divide the property's net operating income by its current market value. The net operating income is the expected annual income generated minus expenses incurred for owning the land.

A short cut is to use cash rent as a substitute for net operating income. Think of rent as the dollar return an off-farm landowner would expect to

receive from renting the land to a tenant. To get a net return one should subtract property taxes, insurance, maintenance or management fees and any other pertinent ownership costs from the cash rental rate. Most people just use the cash rental rate as a proxy for net return.

Dividing Iowa's \$256 per acre cropland cash rent for 2022 by the \$9,350 per acre average cropland value gives a 2.7% cash return on investment. [Rates of return on Iowa cropland](#) have ranged between 2.7% and 6.5% since 1997, www.extension.iastate.edu/agdm/wholefarm/pdf/c2-09.pdf. Dividing Iowa's \$59.50 per acre pasture cash rent for 2022 by the \$3,300 per acre average pasture value gives a 1.8% cash return on investment. Rates of return on Iowa pasture have ranged between 1.5% and 5.1% in the last 26 years.

Gains in cash rent have trailed recent gains in farmland values. As a result, both ratios have generally trended downward over time. The pasture ratio bottomed out in 2014. The cropland ratio made a low in 2022. The ratios vary depending on location, market values and other factors.

Variability drivers

From a regression, the variation in farm real estate loan interest rates explain 71% of the variation in rates of return on pasture and 76% of the variation in rates of return on cropland. Generally, higher interest rates are associated with higher rates of return to farmland.

Suppose a cropland owner wants to push their 2.7% cash rate of return on their \$9,350 per acre cropland in 2022 to 3.0% next year. They could capture a 3.0% return by enticing the operator to up cash rent from \$256 per acre to \$281 per acre. If cash rent holds steady at \$256 per acre, a softening in cropland value to \$8,533 per would also yield a 3.0% cash return. Some combination of rising cash rent and softening farmland value could boost cash rate of return to 3.0%.

Upping the 1.8% cash return on \$3,300 per acre pastureland to 2.0% could be achieved with a pasture cash rent boost from

\$59.50 per acre to \$66.00 per acre, a softening of pasture value from \$3,300 per acre to \$2,975 per acre, or some combination of those changes.

Understand that all of this ignores the impact of inflation, or slowing inflation, on both farmland earnings and farmland values. Recent articles in the Ag Decision Maker newsletter also look into historical returns to farmland ownership:

[Comparing the stock market and Iowa land values: A question of timing](#), July 2022, www.extension.iastate.edu/agdm/newsletters/nl2022/jul22.pdf and [Returns to farmland ownership in Iowa](#), June 2022, www.extension.iastate.edu/agdm/newsletters/nl2022/jun22.pdf.



Voices of Iowa women farmland owners

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“I am blessed with the opportunity to live on the land and help care for it... I am very happy that our daughter has chosen to return to the farm,” shared a woman farmland owner and respondent to the Iowa State University Extension and Outreach Women Landowner Survey. The survey was conducted from July through October 2021. The results are now published on the [Center for Agriculture and Rural Development website](#), www.card.iastate.edu/products/publications/synopsis/?p=1348.

The survey is part of a multi-year project led by the extension farm

management team’s women in ag program to better understand and meet the educational needs of women farmland owners. Through collaborations with the ISU Center for Agriculture Law and Taxation, Water Quality Initiative, and the Department of Economics, the project is bringing comprehensive land management information to audiences of women farmland owners.

Responses to the survey were received from 358 Iowa women farmland owners, representing 91 counties and all crop reporting districts. The team would like to thank every woman

who took the time to respond to the survey or personally share their stories or concerns.

The project team used survey results to pilot eight local Women Managing Farmland educational programs across the state last winter. Now the team is developing printed, online, and in-person educational opportunities and materials on the critical topics of farmland leasing, conservation and farm transition. To stay up to date on educational opportunities, visit the Women in Ag program website or [sign up for the online newsletter](#), www.extension.iastate.edu/womeninag.

The project is partially supported through the USDA National Institute of Food and Agriculture - Critical Agriculture Research and Education grant program and Farm Credit Services of America.

Summary of survey results

Farmland ownership: Survey results indicate 92.0% of women farmland owner respondents are in a decision-making role, among whom 51.0% have a great deal of decision-making power. Respondent's ownership interest ranges from 3 acres to 3,000 acres with a median size of 300 acres. Nearly one-quarter (23.5%) of survey respondents are sole owners of farmland. Most co-owners are joint tenants with right of survivorship; commonly with a spouse (59.5%) or sibling (12.0%).

Women farmland owners often acquire their land in multiple ways. The most typical way is to purchase farmland from non-family (57.5%) or from family (36.6%). Responses indicated 42.5% of women inherited at least some of their farmland after someone passed away and 6.2% received at least some farmland as a gift from a living person. A majority of respondents operate their farmland (54.9%) on a full-time (22.3%) or part-time (32.7%) basis. Responses indicate there are twice as many non-operator landowners who retired from farming or have at least some farming experience (29.7%) than those who have no farming experience (15.4%).

When survey respondents selected their top three reasons for owning farmland, economic reasons were forefront on people's minds:

- 1) source of current income (58.0%),
 - 2) source of retirement income (49.0%), and
 - 3) long-term investment (39.1%).
- Family or sentimental reasons was selected by almost half (44.2%) of the respondents, while preserving land for agriculture was selected by more than one-quarter (28.6%).

More than half (53.3%) of respondents characterized their farm as row crop only, while one-quarter (25.5%) characterized their farm as having livestock or poultry. Other respondents (20.4%) characterized their farm as having only pasture, timber, or Conservation Reserve Program land, or a combination of row crops with these other land uses. Only 0.8% of respondents characterized their farmland as having other uses such as an apple orchard.

Leasing practices: Just over half (51.0%) of survey respondents lease out some or all their farmland. Among these farmland owners, 73.2% lease to only one tenant, and 18.6% lease to just two tenants. A majority of owners (60.0%) have written leases with tenants. Responses indicate 64.6% of owners use fixed cash rental leases, 19.1% use flexible cash rental leases, and 16.3% use a crop share agreement. One-third (36.1%) of respondents lease their

farmland to relatives, 21.1% lease to a neighbor, 15.6% lease to a friend, and 27.2% lease to someone else. Almost as many respondents charged a discounted rental rate (39.0%) as compared to a market rental rate (43.0%). There were 18.0% of respondents who were unsure how their rental rate compared to the market.

Landowner responsibilities was most often (75.3%) selected by survey respondents indicating they are interested in receiving information about the topic. Just under three-quarters of respondents indicated they were interested in receiving information about the economics of farmland ownership and return on assets, crop production costs and other expenses, determining the right rental rates for land, and general farmland lease provisions. Other popular topics were, incorporating conservation practices into leases, finding out more about their land, and negotiating farmland leases. The interests of operating owners and non-operating owners were similar in most areas. The exception is that 62.6% of operating owners and only 41.8% of non-operating owners were interested in receiving information about leasing to a beginning farmer.

Conservation practices: Nearly all (98.0%) of respondents indicated one or more conservation practices are in use on any farmland owned or co-owned. Grass waterways (68.8%) and no-till or strip-till

(50.6%) were selected by over half of respondents. Other popular practices included low-till or conservation tillage (40.1%), terracing (36.6%), and cover crops (32.4%). More operating owners (40.0%) use livestock manure management practices than non-operating owners (15.1%).

For those respondents who lease out some or all their land, they indicated which conservation-related management decisions are being made primarily by their tenant. There were 82.6% of respondents indicating crop variety and crop input decisions, 65.3% of respondents indicating tillage practices, and 41.1% indicating use of conservation practices were made by tenants.

Excess requirements, restrictions and paperwork associated with government programs was of concern to more than two-thirds (68.7%) of respondents. More than half of all respondents are concerned about interference with the ability to change land management practices as conditions warrant (57.6%), low cost-share payments (54.4%), and the true value or lack of value the conservation practices provide to the environment (51.5%).

Agricultural carbon credits programs were most often (31.8%) selected by survey respondents indicating they are interested in receiving information about the topic. More than one-quarter of

respondents indicated they were interested in receiving information about government conservation programs, soil erosion control, soil fertility improvement, and cover crops. Other topics of greatest interest were pasture and hay management, water quality improvement and wildlife habitat improvement. The interests of operating owners and non-operating owners were similar in many areas. Notable exceptions were that 41.1% of operating owners and only 23.0% of non-operating owners were interested in carbon credits, 33.0% of operating owners and only 21.0% of non-operating owners were interested in cover crops, and only 9.7% of operating owners indicated they were not interested in any of the topics, while 24.3% of non-operating owners indicated the same.

Transition practices: Farm transition planning deals with the future of the land. This could include choosing a successor, transferring ownership, or other actions taken during your lifetime as well as estate plans after death. Most (88.4%) of the survey respondents have a will. Most respondents also have identified a potential individual who will eventually take over the management of their farmland (70.1%), and/or an individual who will eventually take over the ownership of their farmland (85.2%).

Women farmland owners who identified a successor were twice as likely to choose a son (33.5%) as a daughter

(15.9%). There were 12.0% of respondents who chose a spouse. The age of the chosen successors ranged from 1 to 96, with an average age of 41. Three-fourths of the successors were age 26 to 57.

Respondents often consulted multiple people about a transition plan for their farmland or farm business. Nearly two-thirds (62.9%) of respondents consulted an attorney about a transition plan. Half that many (33.2%) consulted an accountant or CPA. Just over one-fourth (26.0%) consulted a financial advisor. However, one in five respondents have not discussed a transition plan with anyone.

For those respondents who expect their farmland will eventually be inherited by a family member and kept in the family, they expect roughly equal possibilities that the family will operate the farmland (38.6%) or lease out the farmland (37.9%). There are more operating owners (50.0%) who expect their family members will lease the land to a tenant, than who expect their family members to operate it. For those respondents who expect their farmland will eventually be inherited by a family member and sold, 8.9% expect the farmland to be sold for agricultural purposes and 1.6% expect it will be sold for non-agricultural purposes. Very few respondents expect their farmland will be sold during their lifetime; of these 4.1% expect to sell it for agricultural purposes and 1.1% expect to sell it for non-agricultural purposes.

Lack of understanding about different farmland ownership structures and their tax implications is of concern to nearly two-thirds (64.6%) of survey respondents. Just under half of all respondents are concerned that they are not familiar with the different options for transitioning the farm to the future generations, they have a hard time figuring out a plan that treats all members of the next generation fairly, and they don't know how to find information about business entities that may be useful.

Tax consequences of different transition options were most often (43.3%) selected by survey respondents indicating they are interested in receiving information about the topic. About one-third of respondents were interested in estate and gift tax matters (36.6%), and farmland and farm business management succession options (31.3%). Just under one-quarter of respondents selected estate planning tools such as wills and trusts (23.7%), and lifetime transfers by sale to family members (20.7%) as one of their top three interests. Other topics of greatest interest were lifetime gifting, farm family communication, and business transition tools such as LLCs. The interests of operating owners and non-operating owners were similar in most areas. Exceptions were that 27.0% of operating owners were interested in lifetime transfers by sale to family members and only 13.2% of non-operating owners

were interested. Only 10.8% of operating owners indicated they were not interested in any of the topics, while 23.0% of non-operating owners indicated the same.

Educational preferences: When asked about preferred times for online or in-person educational programming, one-third of survey respondents indicated they prefer mornings (36.0%) or evenings (38.0%), both of which are slightly preferred to afternoons (26.0%). Interestingly, non-operator owners had more of a preference for mornings and operator owners had more of a preference for evenings. Responses indicated the top five ways women farmland owners would like to receive information is 1) newsletters, 2) webinars, 3) fact sheets, 4) half-day in-person educational meetings, and 5) women landowner learning circles. More operator-owners expressed interest in webinars (40.5%), half-day meetings (34.1%), and learning circles (26.0%) than did non-operator owners. Operators interested in receiving educational information are overall younger than interested non-operators. For operators, the most interest came from those 30 to 60 years old; while for non-operators, the most interest came from those above 50, including women in their 80's and 90's. Older owners showed a strong preference for newsletters and large font notebooks, while younger owners preferred learning circles and field days.

Landowner characteristics: The ages of the respondents ranged from 21 to 98, with the largest proportion (72.7%) between 50 and 80 years old. Most respondents (98.0%) had been married at least once. About one in five respondents (22.8%) were widowed, divorced or separated or never married. Nearly one-third (30.4%) of respondents are first generation farmland owners of the parcel they have owned the longest. Second (25.4%) and third (24.5%) generation owners each account for one-quarter of the respondents, while fourth generation or more owners accounted for one-fifth (19.7%) of survey respondents. Most (92.4%) respondents do not feel burdened by farmland ownership. For those that do feel burdened, difficulty finding a good operator, lack of relevant knowledge, and worries about risk or debt were some of their concerns.

Most (83.5%) survey respondents have off-farm income and nearly half (43.0%) of respondents reported receiving no less than 70.0% of their gross household income from off-farm activities. One-third (34.2%) received less than \$49,999 in income from farming activities. Overall, the approximate gross cash income from farming before deducting expenses and taxes in 2020 mostly (81.7%) lies below \$350,000, with the percentage being slightly lower than the national level of 89.0%, as reported by USDA.

Learn more in this [short video](https://vimeo.com/723489276), <https://vimeo.com/723489276>.



Disentangling input and output price relationships

By Lee Schulz, extension livestock economist
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Profitability measures the amount a business earns from its use of labor, management and capital. Over simplified, profit is what is left over from sales after all production expenses have been paid. In a stable economic environment, both measuring and predicting output prices, input prices and profits becomes relatively mundane.

Inflation, the pandemic, supply chain disruptions, a tight labor supply, rising interest rates and geopolitical uncertainty make the current economic environment anything but stable. Still, farmers must find ways to navigate their businesses through the choppy seas of instability.

Peter Drucker is often described as the founder of modern management. One of his principles says, "If you can't measure it, you can't improve it."

Fortunately, USDA's National Agricultural Statistics Service (NASS) has been providing prices paid and prices received measuring aids for over a century.

Indexes measure changes over time

A price index measures the change in prices from some reference point, or base period, to another point in time. Ideally the base period is one not impacted by inflation or supply chain disruptions. The closer the

base period is to the current time, the more value an index may have in predicting future trends. The index reference point is generally one year but can span multiple years.

Permanent legislation requires USDA to maintain the prices paid and prices received index series using the 1910-1914 base period for parity price purposes. In tandem, USDA also provides a more recent base period which has undergone a number of updates through the years. The 2011 base year (2011=100) is the most recent update. The year 2011 was a favorable year for agricultural growth and profitability.

Feeder cattle prices reflect outside market forces

Feedlot managers understand how cattle characteristics like weight, lot size, frame, muscling, gender and breed impact feeder cattle prices. Secondary impacts from related markets also impact prices. Previous research has disentangled some of these impacts.

Diesel fuel prices impact transportation costs to get feeder cattle from auctions or off the farm to a feedlot and therefore affect feeder cattle prices. Research on Iowa feeder cattle auction sales shows that a ten-cent per gallon hike in diesel fuel price is associated with a \$0.20 per cwt. dip in calf price. Without an offsetting rise in fed cattle prices, or decrease in something else, feedlots have no choice other than paying less for calves. Assuming that all other factors held steady, the roughly \$2 per gallon rise in diesel fuel prices from July 2021 to July 2022 resulted in feeder calf prices that were \$4 per cwt. lower than they would have been.

Other market characteristics like fed cattle prices and corn prices help determine what a buyer "can pay" for calves. Research on Wisconsin feeder cattle auction sales shows that a ten-cent per bushel hike in corn prices is associated with a \$0.70 per cwt. decrease in calf price, assuming all other factors remain the same. This would be the impact for a 700 pound feeder steer. The impact is greater at lighter weights because feedlots must put on more pounds of gain, which takes more bushels of expensive corn.

Two ways to interpret data

Movements of an index from one month to another can be expressed as changes in index values. Using the percent change of an index is more useful to express the movements of the price level. This is because index values are affected by the level of the index in relation to its base period, while percent changes are not.

The prices paid index for commodities, services, interest, taxes and wage rates, labeled PPITW, is a top level index. NASS constructs it from all component indexes including production, interest, taxes, wage rates and family living. The production index includes feed, livestock and poultry, seeds, fertilizer, agricultural chemicals, fuels, supplies & repairs, autos & trucks, farm machinery, building materials, services and rent indexes. NASS breaks component indexes down further into sub-component indexes and items. For example, the component feed index has separate sub-component indexes for complete feeds, feed grains, hay/forages, concentrates and supplements. Items within feed grains are barley, corn, sorghum and oats.

Recent surges squeeze farmers

The July 2022 prices paid index for PPITW was up 12.6% from July 2021 and up 23.8% from two years ago. Production items were up 15.1% year over year. Indexes for interest and taxes are annual averages and are up 3.1%

and 3.8%, respectively, in 2022 compared to 2021.

The wage rate index is a quarterly average and is up 3.8% from the third quarter of 2021. For the family living index, NASS uses the consumer price index (CPI) which is a measure of the average change over time in the prices paid by urban consumers for a market basket of goods and services. The Bureau of Labor Statistics compiles the CPI. From July 2021 to July 2022, the all items CPI rose 8.5%. So on top of higher production costs, farmers like everyone else, are experiencing higher living expenses.

Understand price vs. expense

Any price index, be it the PPITW or CPI, measures changes in prices only. They do not measure changes in expenses, which are calculated as prices times quantities consumed. While we as consumers can sometimes buy fewer, buy different brands, buy substitutes, buy smaller packages, or for some items maybe not buy at all this calculus is much different for producers. How easy is it for crop producers to quickly change expenses for seed, fertilizer, pesticides, fuel, maintenance and labor? Likewise, livestock producers need time to adjust feed, herd health, breeding and labor expenses.

NASS obtains prices paid from establishments that sell goods and services to farmers and ranchers. NASS asks firms

to report the price for the specified item "most commonly bought by farmers" or that was the "volume seller." Selected individual items represent groups of inputs producers purchase. Approximately 135 items represent all input items. Additional data from the Bureau of Labor Statistics, the Energy Information Administration, the USDA Agricultural Marketing Service and the USDA Economic Research Service are also used in the calculation of indexes.

NASS weights index items by importance

In some cases a large number of items can make up a small percentage of the index. In other cases a few priced items must represent many functionally different items such as farm supplies.

NASS uses farm and household expenditure data, obtained through the Agricultural Resource Management Survey or ARMS, to compute the value weights which are measures of the relative importance of items in the prices paid index. These are a set of numbers between zero and one. Value shares sum to unity by definition and are used to weight items, sub-component indexes, and component indexes to obtain higher-level indexes. For 2022, the relative weights for the PPITW index are production items (72.5%), interest (2.2%), taxes (3.2%), wage rates (7.8%) and family living (14.3%).

The PPITW for the crop and livestock sectors are indexes constructed using weights derived from crop farm expenditures and livestock farm expenditures, respectively. Figures 1 and 2 show that these indexes were up 12.7% and 12.5%, respectively, in July 2022 compared to July 2021.

The prices received indexes for grain and oilseed production (think corn and soybeans) and cattle production (including calves, feeder cattle, fed cattle, and cull cows and bulls) are up 20.9% and 16.2%, respectively.

At this particular point in time the prices that farmers receive for crops and livestock have risen slightly more than have the prices farms paid for inputs. Of course this isn't the case for all farms and hasn't been the case at all times. Economic pressure continues as input prices have surged and commodity prices have been volatile and lagging cost increases at times.

Figure 1. Year-to-year change in estimated prices paid and prices received by corn and soybean farmers. Data source: USDA-NASS.

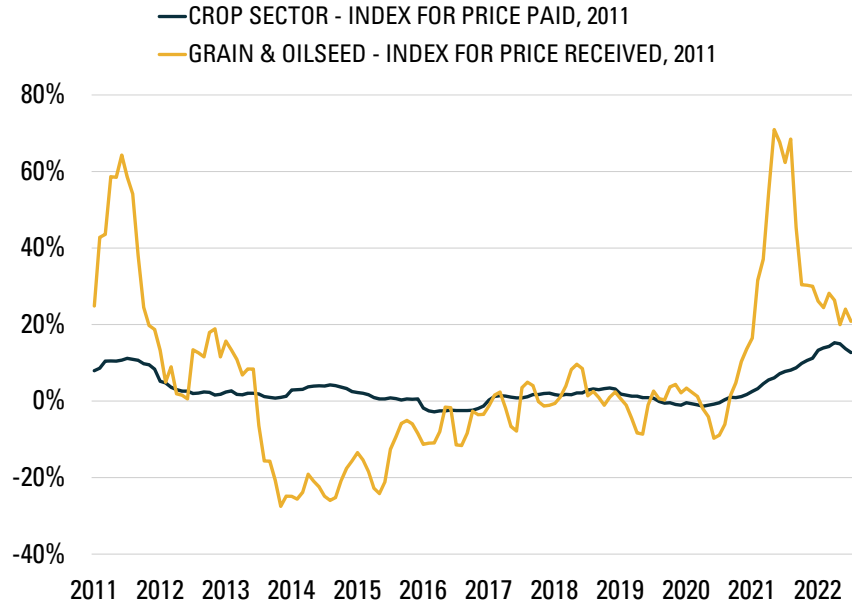
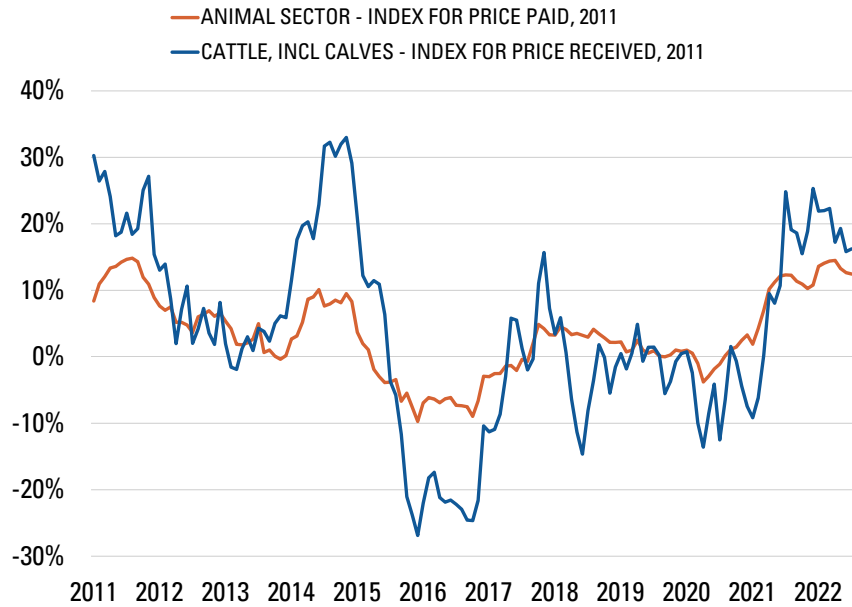


Figure 2. Year-to-year change in estimated prices paid and prices received by cattle producers. Data source: USDA-NASS.





Arctic sea ice is disappearing

By Don Hofstrand, retired agricultural business specialist

Reviewed by Eugene Takle, retired professor emeritus, Iowa State University

This article is part of our series focused on the causes and consequences of a warming planet.

Sea ice is frozen seawater that forms, grows and subsequently melts in the ocean. It forms on the ocean’s surface when the ocean surface temperature is below freezing.

Sea ice covers about 12% of the ocean’s surface. However, the [extent of sea ice](https://nsidc.org/data/seaice_index), https://nsidc.org/data/seaice_index, varies greatly during the year, thawing and shrinking during the summer and freezing and expanding during the winter.

Sea ice is important because it keeps the polar-regions cool and helps moderate the Earth’s climate. However, both the thickness and extent of Arctic sea-ice has declined dramatically over the past thirty years. This loss of sea ice has the potential to accelerate global warming and change the climate.

The reduction in sea ice is caused by more of the sea ice melting during the summer than is freezing during the winter. As the sea ice oscillates between summer melting and winter freezing, the size of the Arctic ice sheet declines over a period of years and decades.

This decline over time is driven by the difference in the impact of sunlight shining on ice versus shining on water. When sunlight shines on sea ice, most of the light is reflected back into space and little is absorbed by the ice as heat. But when sunlight shines on the water of the ocean surface, most of the light is absorbed by the water as heat and little is reflected back into space.

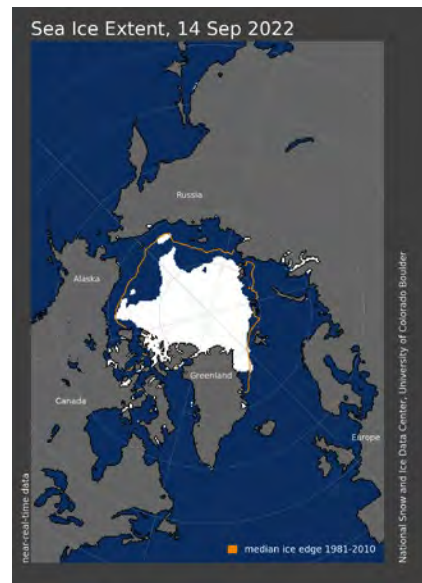
This phenomenon can cause what is called a “feedback loop” where the area of sea ice gradually decreases over a period of years. As sea ice melts, it exposes open water to the sun. So more water and less ice creates more heat. The additional heat melts more sea ice, which exposes more water to the sun. So more heat is accumulated in sea water. The additional heat melts more ice which exposes more water and so on.

This feedback loop is triggered initially by human-caused warming of the Arctic. But once triggered, the feedback loop drives the long-term loss

of Arctic sea ice regardless of what we do to control the Arctic warming.

Antarctica also has sea ice. The extent of Antarctica’s sea ice is much less than that of the Arctic because most of Antarctica’s ice sheet is land ice that covers the huge continent of Antarctica.

See the [Ag Decision Maker website](http://www.extension.iastate.edu/agdm/energy.html#climate), www.extension.iastate.edu/agdm/energy.html#climate, for more from this series.



Source: National Snow and Ice Data Center. Sea Ice Extent, September 14, 2022. Outline shows the typical extent for that day based on a 30-year (1981-2019) median.



This year's drought had some bite

By Chad Hart, extension crop market economist, 515-294-9911 | chart@iastate.edu

The September updates for USDA's [Crop Production](http://www.nass.usda.gov/Publications/Todays_Reports/reports/crop0922.pdf), www.nass.usda.gov/Publications/Todays_Reports/reports/crop0922.pdf, and [WASDE](http://www.usda.gov/oce/commodity/wasde), www.usda.gov/oce/commodity/wasde, reports incorporated the first round from the objective crop yield surveys for corn and soybeans (where USDA representatives physically examine the crops) and the acreage data gathered by the USDA-Farm Service Agency. So the markets were expecting some major shifts in the balance sheets with the ongoing drought and the concerns about the general economy. The corn market had prepared for a downgrading of the corn crop and cuts in usage. Meanwhile, the soybean market looked for smaller adjustments as most expected supply estimates to remain near August levels. Well, in essence, the markets got half of what was expected.

Crop acreage

USDA receives a variety of data about crop acreage across the country, from the surveys NASS conducts in March and June to the acreage reports submitted to FSA for farm bill programs and RMA for crop insurance. NASS usually adjusts their estimates in the fall to account for the plantings reported to FSA. This year, the FSA reports showed fewer plantings than what the

original NASS surveys indicated, which is not surprising given the delays in planting. For corn, national planted area was reduced by 1.213 million acres to a total of 88.6 million. In total, that brought corn planted area down by over 5% from last year. The estimates for corn area were lowered in 24 states, held steady in 15, and increased in nine. The increases were in major production states, as Illinois and Indiana were bumped up by 100,000 acres each, along with Kansas and Michigan. But the largest increase was in Iowa, adding 200,000 acres, bringing Iowa's corn area back up to the 2021 level. However, these increases were more than offset by declines in roughly half of the country. Missouri saw the largest decline at 250,000 acres. Minnesota, New York, South Dakota, and Texas were all down 150,000 acres. Colorado, Tennessee, and Nebraska also had decreases of 100,000 acres or more.

Normally, if corn area declines, soybeans capture back some of those acres. But this year, both crops saw their acreage estimates cut in this update. Nationally, total planted area for soybeans was reduced by 570,000 acres, to 87.455 million acres. Unlike corn, more states had increased acres (14) than decreases (11), but the sizes of

the losses tipped the national total lower. The larger increases were set in Missouri with 200,000 additional soybean acres, Nebraska and Ohio with 150,000, and Louisiana with 110,000. The largest decline was in Illinois with 400,000 less soybean acres. South Dakota lost 300,000 acres. Iowa dropped 200,000 acres. Tennessee, Kentucky, and North Carolina each gave up at least 100,000 acres. So both crops entered the harvest season with fewer acres than originally anticipated.

Crop yields

The next piece to the supply puzzle is the yield. The September yield estimates are a combination of the data from USDA's objective yield survey and the simultaneous farmer yield survey. Figure 1 shows the current corn yield estimates and how they have changed. The national average corn yield estimate fell 2.9 bushels to 172.5 bushels per acre. Iowa's corn yield estimate was cut by five bushels to 200 bushels per acre. Wisconsin's corn yield declined by two, but the yield would still a record. Minnesota's went down by three. North Dakota dropped four bushels and Nebraska decreased by five bushels. The drought and heat stress is definitely showing up across the western Corn Belt. Illinois was one of the few states to see their

corn yield estimate rise. Putting together the acreage and yield updates, USDA found evidence to lower the corn production estimate below 14 billion bushels. That is a sizable cut from the 15 billion bushels projected earlier in the year.

But I think the prize for the biggest surprise in the reports goes to the soybean yield adjustment. The national average soybean yield estimate came in at 50.5 bushels per acre, down 1.4 bushels from the August figure. As with corn, most states saw declines. The two areas that were exceptions were the Southeast and Iowa and Wisconsin. Iowa's soybean yield estimate increased by a bushel to 59 bushels per acre. Wisconsin's yield also rose one bushel. Tennessee and Georgia each gained two bushels, while the Carolinas each gained one. Kansas and Maryland took the largest cuts, at eight bushels each. Illinois' yield fell two bushels, along with Missouri, Kentucky, and South Dakota. Overall, national soybean production is projected at 4.378 billion bushels, which would still be the fourth largest, trailing only the 2017, 2018, and 2021 crops.

Corn usage was also updated, with cuts impacting the major usage categories. The slowdown in ethanol production over the past six weeks translated into a 20 million decline in corn grind out of the 2021 crop. However, corn export sales out of the 2021 crop were increased by 25 million bushels. With the 5 million bushels subtracted

Figure 1. US corn yield estimates in September. Source: USDA-NASS.

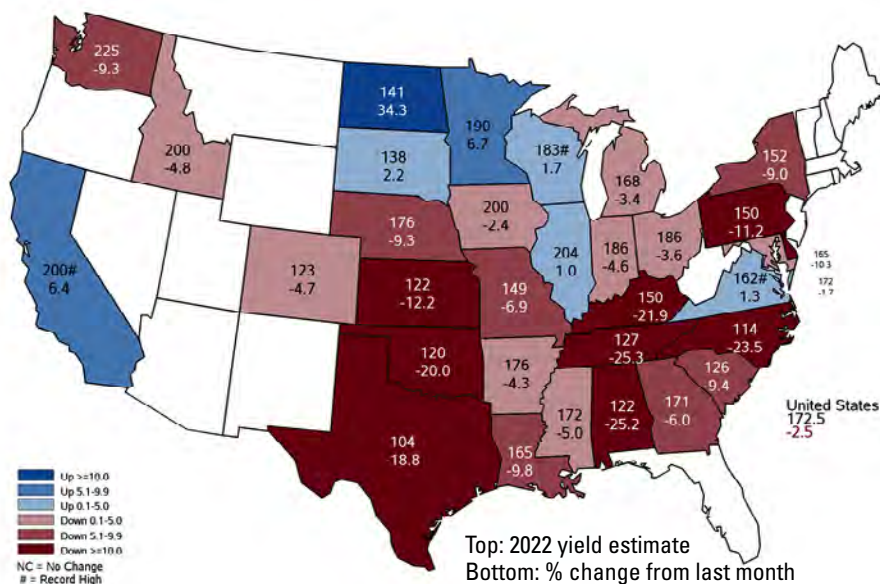
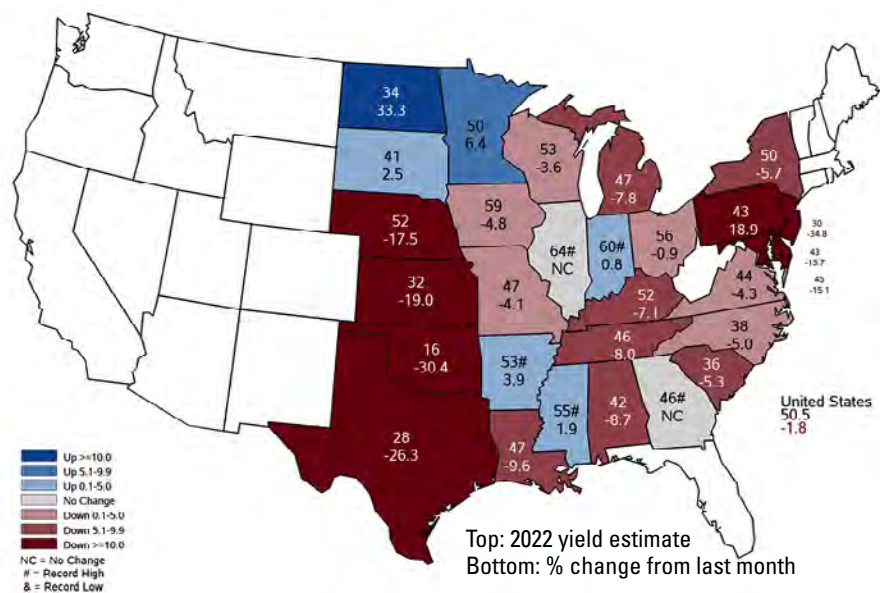


Figure 2. US soybean yield estimates in September. Source: USDA-NASS.



from stocks, the 2021-22 corn ending stocks are projected at 1.525 billion bushels. The offsetting changes allowed USDA to maintain its 2021-22 season-average price estimate at \$5.95 per bushel. For the new (2022) crop, feed and residual usage and exports were both cut by 100 million bushels and corn usage for ethanol was slashed by 50 million bushels. Overall corn usage is projected to be nearly 600 million bushels lower for the new corn marketing year. 2022-23 ending stocks are now set at 1.219 billion bushels, down 170 million from last month and down 306 million from last year. The 2022-23 season-average price estimate rose 10 cents to \$6.75 per bushel. Soybean usage adjustments reduced domestic and international consumption. For the 2021 crop, exports were lowered by 15 million

bushels, reflecting lower sales into China as crushing margins there are poor. That change boosted the 2021-22 ending stocks to 240 million bushels, so stocks rose, but the market remains tight. The 2021-22 season-average price estimate held steady at \$13.30 per bushel. For the 2022 crop, the usage reductions spread and grew. Domestic crush dropped by 20 million bushels, so while domestic usage is still expected to grow, that growth was cut in half. The larger reduction hit in exports, with 70 million bushels removed there, based on a

combination of greater global supplies and more competition. Despite the losses in usage, 2022-23 ending stocks are projected at 200 million bushels, down 45 million from last month and down 40 million from last year. And the 2022-23 season-average price estimate held at \$14.35 per bushel.

With the September reports coming in with smaller crops, thoughts are more production cuts are coming. The market adage goes: *big crops get bigger and small crops get smaller*. Futures prices for both crops reacted positively to the reports,

with soybeans seeing the (much) larger gains. The price moves brought futures prices back roughly in line with USDA projections. But the reports also revealed the concerns about crop demand. All of the major demand sectors were cut within the reports. For the moment, USDA's adjustments have supplies falling faster than usage, which supports prices. But if those usage declines accelerate, the price support can disappear quickly.

For more ag market outlook, [see this month's video](https://youtu.be/4vK51oL0714), <https://youtu.be/4vK51oL0714>.

Ag Decision Maker is written by extension ag economists and compiled by Ann Johanns, extension program specialist, aholste@iastate.edu.

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