Conservation practices: EQIP and CSP cost-share and stacking carbon payments
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While carbon farming is a relatively new topic, most farmers are well aware that there are multiple carbon initiatives trying to enroll aces in conservation practices like cover crops and no-till to sequester carbon or reduce the carbon intensity of agricultural commodities.

As a group, these private, voluntary carbon initiatives offer farmers a large menu of options to contract with them and get paid based on the implemented practices, the carbon sequestered through those practices, or the carbon intensity of the commodities produced.

For example, some initiatives compensate farmers at a rate of $5 per acre to implement cover crops, while others pay $15 per metric ton of carbon dioxide sequestered in the field through cover crops. Since farms in the Corn Belt sequester, on average, about 0.3 metric tons of carbon dioxide per acre with cover crops, a payment of $15 per metric ton of carbon dioxide would be equivalent to $4.50 per acre. Another modality to incentivize carbon farming is to compensate participating farmers with price premiums for “low-carbon” commodities. For example, participating farmers might receive 2.5 cents per bushel as a price premium for “low-carbon” corn, if the corn crop was grown with cover crops or in a no-till system. A farm with an average yield of 200 bushels of corn per acre would receive a “low-carbon” premium equivalent to $5 per acre.

The goal of carbon payments is to induce farmers and ranchers to implement conservation practices that reduce and sequester greenhouse gas emissions in a way that can be verified and certified, so those efforts can be later monetized by selling carbon credits or low-carbon intensity commodities.

Farmers have multiple motivations to adopt conservation practices beyond the economic calculation, but knowing their implementation costs is a great starting point to make informed decisions.

While the USDA incentivizes the adoption of conservation
practices through many programs, the Environmental Quality Incentives Program or EQIP, and the Conservation Stewardship Program or CSP are the largest programs for working lands. These programs provide technical and financial support to qualifying farms, and are intended to help farmers address local resource concerns like the degradation of the soil, water, air, plant, animal, or energy resources. Learn more about these programs in AgDM File A1-39 “Financial Support for Conservation Practices: EQIP and CSP,” https://go.iastate.edu/AGDMA139.

However, these programs do not particularly target carbon sequestration but global environmental benefits. Additionally, private carbon initiatives might or might not allow the “stacking” of carbon payments with cost-share from EQIP and CSP on the same practices. Depending on the carbon initiative, and the timing of farmers’ decisions, farmers can receive around $30 per acre per year over 10 years for implementing no-till and cover crops in Iowa. Learn more about the interaction of carbon payments with EQIP&CSP cost-share payments in AGDM File A1-40 “Carbon Farming: Stacking Payments from Private Initiatives and Federal Programs,” https://go.iastate.edu/AGDMA140.

Unfortunately, there is no fast and easy rule to identify profitable carbon farming opportunities. Net returns depend on multiple variables, such as the implementation cost for the contracted conservation practice, the payment regime (per outcome versus per practice), the soil type and weather patterns that affect how much carbon can be sequestered by different conservation practices, the actual conservation practices to be implemented, farmers’ experience with the conservation practice, and the availability of cost-share payments. Ag Decision Maker File A1-78 “Net Returns to Carbon Farming” (https://go.iastate.edu/AGDMA178) can help agricultural producers organize the information and think through the agronomic and economic variables affecting the net returns to carbon farming for 66 conservation practices in each county of the United States. After checking whether carbon farming would be profitable and before signing a carbon farming contract, farmers are strongly encouraged to ask plenty of questions to clarify: what kind of information they would need to share with the carbon initiative and how frequently, the contract length and its exit clauses, the methods used to measure and verify the carbon sequestration, and any penalties in the event that the contract cannot be executed as planned.
Different data gatherers within USDA align the definition of a cow with how analysts will use the data. USDA’s Agriculture Marketing Service (AMS) focuses on marketing characteristics. AMS defines a cow as “A female bovine that has developed through reproduction or with age, the relatively prominent hips, large middle and other physical characteristics typical of mature females.”

USDA’s National Agricultural Statistics Service focuses on production and inventory characteristics. NASS defines a cow as “A female bovine that has had at least one calf.” NASS further distinguishes milk (dairy) cows from beef cows. A milk cow, is a cow, excluding a nurse cow, regardless of breed kept primarily to produce milk for home use or for sale. Dairy cows and dairy replacement heifers make up 14% of all cattle and calves in the United States.

A beef cow, is a cow, regardless of breed, kept primarily to raise or nurse calves. Beef cow inventories largely determine the number of feeder cattle entering feedlots and eventual slaughter supplies. The number of cattle slaughtered is the primary determinant of the supply of beef. The interaction of supply and demand determines the market price level.

Beef cows and beef replacement heifers make up 35% of all cattle and calves.

**Head count changes drive cattle cycle**

Analysts watch changes in estimated beef cow and beef replacement heifer inventories for clues on whether producers are shrinking or expanding beef herds, and by how much.

Based on producer surveys for the biannual Cattle report, USDA NASS estimates the July 1, 2023 US beef cow inventory at 29.4 million head (Table 1). This is down 800,000 head or 2.6% from July 1, 2022. This is the fifth consecutive year-over-year decline in the July 1 beef cow herd and the lowest mid-year beef cow inventory in the history of the data going back to 1971.

The milk cow inventory is unchanged from July 1, 2022, at 9.4 million head. Dairies are facing compressed margins

| Table 1. US cattle inventory by class and calf crop. Source: USDA-NASS. United States |
|-----------------------------------------|----------------|----------------|
| July 1 inventory *                      | 2022           | 2023           | 2023 as % of 2022 |
| Cattle and calves                       | 98,600.0       | 95,900.0       | 97.3              |
| Cows and heifers that calved            | 39,600.0       | 38,800.0       | 98.0              |
| Beef cows                               | 30,200.0       | 29,400.0       | 97.4              |
| Milk cows                               | 9,400.0        | 9,400.0        | 100.0             |
| Heifers 500 pounds and over             | 15,600.0       | 15,000.0       | 96.2              |
| For beef cow replacement                | 4,150.0        | 4,050.0        | 97.6              |
| For milk cow replacement                | 3,750.0        | 3,650.0        | 97.3              |
| Other heifers                           | 7,700.0        | 7,300.0        | 94.8              |
| Steers 500 pounds and over              | 14,400.0       | 13,900.0       | 96.5              |
| Bulls 500 pounds and over               | 2,000.0        | 1,900.0        | 95.0              |
| Calves under 500 pounds                 | 27,000.0       | 26,300.0       | 97.4              |
| Feeder cattle outside feedlots          | 35,700.0       | 34,400.0       | 96.4              |
| Cattle on feed                          | 13,400.0       | 13,100.0       | 97.8              |
| Calf crop **                            | 34,464.5       | 33,800.0       | 98.1              |

* 1,000 head, **First half of 2023 estimate plus second half of 2023 expectations. Full report: https://downloads.usda.library.cornell.edu/usda-esmis/files/h702q636h/6682zm254/1v53mc975/catl0723.pdf
in 2023 with both supply and demand pressures influencing milk prices. But dairies are not liquidating. One reason is dairies are relatively high fixed cost operations. In the short-term, dairies minimize losses by maintaining full production as long as prices cover variable costs.

Heifers held for beef cow replacement on July 1, 2023 totaled 4.05 million head, 2.4% below the 4.15 million head on July 1, 2022. This is the lowest July 1 beef replacement heifer inventory on record dating back to 1973 when the data series began. Dairy heifers held for replacement totaled 3.65 million head, which is the smallest number since 2004.

More market data on crossbreds would be useful
The availability and rising adoption of sexed semen allows dairies to focus artificial insemination on the highest quality dairy cows and heifers for producing dairy replacement heifers. Dairies can breed the remaining dairy cows and heifers to beef breeds to produce beef-dairy crossbred calves. Crossbreds have better feed efficiency, gain, etc. in feedlots as well as more favorable carcass yield and muscle conformation, compared to straight dairy animals, which brings their value closer to beef breed calves.

USDA AMS does not currently identify beef-dairy crossbred cattle separately in Livestock Mandatory Reporting data collected from packers. AMS only offers two fed cattle categories: beef or dairy. Therefore, packers may report purchases of beef-dairy crossbred cattle as either dairy, or beef.

USDA AMS does publish head count, dressing percent, weight range, weighted average weight, price range, and weighted-average price for fed dairy steers and heifers separately from beef breed fed cattle. Given the growing share of beef-dairy crossbred cattle in feedlots, collecting and publishing beef-dairy crossbred fed cattle information would greatly aid in efficient price discovery.

**Dairy producers show some optimism**
USDA NASS surveys producers on prices received for animals sold for dairy herd replacement. NASS publishes those prices in the January, April, July and October Agricultural Prices reports. Nationally, for July 2023, the average price received for milk cows was $1,760, an increase from April 2023 of $40.00 (up 2%). Year-over-year the increase was $50 per cow (up 3%). The July 2023 price was the highest since April 2016.

Despite current dismal dairy profits, stronger dairy replacement prices suggest producers expect economic conditions to improve. Sales of culled dairy cows and bulls, as well as dairy bull (steer) and heifer calves not held as replacements that enter the beef system as feeder cattle provide additional income for milk producers. Those prices remain exceptionally strong.

**Projecting feedlot placements**
Analysts assess the number of cattle outside feedlots available for placement into feedlots by adding the number of steers 500 pounds and over, other heifers 500 pounds and over, and calves under 500 pounds and then

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**Figure 1.** July 1 feeder cattle supplies outside feedlots, US. Data Source: USDA-NASS. Compiled by the Livestock Marketing Information Center.
subtracting the total number of cattle currently on feed. These categories include beef breeds, dairy breeds and beef-dairy crossbreds. Other heifers are heifers that will not be bred as replacements for the beef or milk herd but will instead be destined for feedlots. The number of feeder cattle not currently in feedlots is 34.4 million head, which is smaller by 3.6%, or 1.3 million head, than at this time last year (Figure 1). This is the second smallest feeder cattle supply in the data series back to 1973. Only 2014 was smaller by 100,000 head.

From the supply side of the equation, calf, feeder cattle and fed cattle prices are all expected to continue increasing. This may or may not result in high returns. Costs remain high, and demand is key.

Maximize revenue generated from cull cows

Cows that are greater than 42 months old are eligible for USDA carcass quality grades of Commercial, Utility, Cutter, and Canner. These grades, however, do not reflect common trade practices for slaughter cows. Instead, slaughter cows are commonly procured based on body condition scores (a measure of live animal fat cover). Body condition scores range from 1 (extremely emaciated) to 9 (very obese).

Breakers (or Breaking Utility) are slaughter cows with a body condition of 7 or higher and are expected to yield carcasses in the range of 75-80% lean and are processed into various cuts.

Cows with a body condition score of 5 to 7 and an estimated red meat yield of 80-85% are classified as Boning (or Boning Utility) and yield a few merchandisable cuts but are mostly used for boneless beef.

The Lean classification refers to cows with a body condition score of 1 to 4 and an estimated red-meat yield of 85-90% and yield at most a few merchandisable cuts with the majority of the carcass used for boneless beef.

Some cows fed a high-grain diet may develop a white fat and be designated Premium White and have an estimated red meat yield of 65-75%.

Market reports sometimes differentiate slaughter cows within each class, according to dressing percentage estimated as low, average, or high.

From the Sioux Falls Regional Livestock Auction - Worthing, SD report, published by the USDA Agricultural Marketing Service Livestock, Poultry, & Grain Market News and the South Dakota Department of Ag Market News, Breakers have represented roughly 26% of the head count so far in 2023 while Boning cows have represented 32%, Lean 36%, and Premium White 6%.

Producers who sell slaughter cows should pay close attention to market reports about the price differentials of the cows in these classes. Cows that can be fed enough to gain body condition to step up in classifications can add weight, and value, at the same time. The average price so far in 2023 for Premium White cows of average dressing has been $115.25 per cwt. according to the South Dakota report. Breaker cows have averaged $104.67 per cwt., Boning cows have averaged $96.13 per cwt., and Lean cows have averaged $86.45 per cwt.

Slaughter cow prices are typically lowest in the fall as many producers sell cull cows right after weaning. This offers opportunities to add value through adding weight, improving quality, and taking advantage of seasonal price patterns. The Cow Sell Calculator Decision Tool, www.extension.iastate.edu/agdm/livestock/html/b2-35.html, available from the Iowa State University Extension and Outreach Ag Decision Maker website compares opportunities for marketing cows at weaning or incurring additional costs to target other (later) markets.
High farm liquidity cushions against low margins
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The recently updated AgDM File C1-12 “Liquidity Analysis of Iowa Farms”, www.extension.iastate.edu/agdm/wholefarm/html/c1-12.html, explores in detail the evolution of financial liquidity among mid- and large-size Iowa farms in 2022 against a backdrop of strong but declining accrued net farm income. All indicators point to a smaller share of farms in vulnerable liquidity situations, and an overall reduced need for working capital financing in 2023, except maybe for farms with vulnerably liquidity.

The 2022 average net farm income in Iowa was the second highest on record, at $265,013. A high income continued to improve the overall financial situation of most Iowa farms. In particular, financial liquidity improved to levels not seen since 2012, and total debt declined to 2016 levels.

The average current ratio climbed to 6.87 in December 2022, becoming the second-highest ratio after the 7.08 level from 2012 (Figure 1). Having $6.87 in cash, inventories, and other liquid assets per dollar in debt that will come due over the next twelve months means that the average farm should be able to comfortably cash flow its normal operation (not accounting for any expansion plans) in 2023, despite lower profit margins. Short-term liabilities declined by 26% in 2022, accumulating a 48% decline since their peak in 2017, while short-term assets remained stable.

Multi-year trends suggest that overall farm liquidity has continued to improve in 2022, almost fully offsetting the persistent erosion of liquidity observed between 2014 and 2020.

Figure 1. Ending current ratio and average liabilities (by maturity) of Iowa farms.
The egg market has experienced significant supply and demand swings over the past few years. From the COVID-induced demand spike in 2020 as the pandemic forced many to prepare a greater proportion of meals at home to the supply cuts caused by the loss of layers to High Pathogenic Avian Influenza (HPAI) in both 2015 and 2022, egg pricing and availability have been more volatile. To provide some guidance on the potential path forward for both the industry and consumers, we have examined a few key historical relationships and utilized those relationships to project future movements within the egg market.

Over the past 10 years, monthly egg prices have topped $1.50 per dozen for four periods. Two of those periods were demand-driven, the 2018 spike was related to strong domestic demand (along with a HPAI outbreak in international markets) and the 2020 run associated with COVID. Two of those periods were supply-driven, the 2014-15 surge and the 2022 market, with both heavily influenced by the HPAI outbreaks in the United States. Figure 1 displays the relationship between the price of eggs and the ratio of table eggs to total eggs in the industry. As the graph shows, egg prices tend to return to more normal levels much quicker after a demand shock than a supply shock.

Typically, 86-87.5% of the eggs produced within a month are consumed and 12.5-14% of the eggs are hatched to add birds to the flock. The demand shocks tend to be short-lived and often can be handled within the normal seasonal movements of the industry. For example, both the 2018 and 2020 price spikes dissipated within two months and the industry was able to maintain the ratio of table eggs to total eggs within the typical range.

The supply shocks tend to have impacts that extend for multiple months and force significant changes for both producers and consumers. The loss of birds due to diseases like HPAI can be significant to the industry, as producers must devote more eggs to rebuilding their flocks, reducing the ratio of eggs headed to consumption. When the ratio falls below 86%, egg prices move higher and tend to remain elevated until the ratio once again exceeds 86%. That was the challenge in 2015 and 2022, as the reoccurrence of HPAI in the US in the fall of 2022 has forced the retention of more eggs for flock development. While the ratio has not surpassed 86%, the seasonal swings (or lack thereof) in the ratio have shifted to enhance egg production and lower egg prices. This shift can be better seen in Figure 2.

Figure 1. The ratio of table eggs from total eggs and egg prices.
Figure 2 displays the seasonal pattern within the egg ratio. This graph, along with the two following it, contain the five-year average pattern for the variable (the black line), last year’s pattern (the blue line), this year’s projection based on beginning of year (January) data and the five-year average (the orange line), and this year’s actual data (the red line). As the ratio data shows, the trend over the past couple of years was for a smaller table-to-total egg ratio, meaning more eggs were retained to increase flock size. There is a consistent pattern of retained more eggs during the summer and less in the winter. And while the 2022 HPAI event definitely induced more egg retention than usual, the seasonal pattern was still maintained. However, in 2023, egg producers deviated from the usual pattern. Rather than shifting a greater percentage of eggs to hatching this spring, the industry maintained a stable percentage of egg to consumers. This provided a relative boost to egg supplies this spring.

Figure 3 displays the monthly swings within table egg supply. And again, the general pattern is very consistent across the years. But the 2022 HPAI event reduced egg supplies by roughly 300 million by April 2022 and the industry was slowly closing the gap until the reoccurrence in November. The stabilization of the ratio throughout 2023 has allowed table egg supplies to return to normal levels.

Thus, supplies have recovered and prices have dropped significantly. The historical data suggests that egg prices are still volatile and will be until the egg ratio reaches back consistently above 86%. While egg pricing is back to normal levels, the egg supply chain is still healing from the impact of the 2022 HPAI outbreaks. The experience of the past five years shows that the egg industry is fairly resilient when it comes to dealing with demand shocks. The strong shift to at-home egg consumption due to COVID led to a very short temporary spike in prices. However, shocks to the supply chain, such as HPAI, can have a much stronger and longer effect on the egg market.

Figure 2. Seasonal variation in the egg ratio.

Figure 3. Egg supplies.

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Supply and use shrinkage
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The August Crop Production and World Agricultural Supply and Demand Estimates reports set the stage for the crop markets as we head toward harvest. The August numbers provide the first monthly update where farmers weigh in on potential yields and production, via a national survey. Data from the objective yield survey, where actual field samples are taken, will begin with the September reports. A quick summary of the reports shows expected corn and soybean supplies and usage are shrinking.

For corn, USDA’s update showed some additional imports and lower usage for old crop (2022) corn, while reducing both supply and usage projections for new crop (2023) corn. Based on trade data, USDA added 10 million bushels of corn imports to the 2022 crop. Corn export sales continue to lag well below average, forcing USDA to cut 2022 exports by 25 million bushels. Corn sweetener processing has also slowed, leading to a 20 million decline there. The combined shifts add 55 million bushels to the 2022-23 ending stocks, raising them to 1.457 billion bushels. Those additional bushels partially offset the production cut for the 2023 crop. Data from the farmer yield survey supported USDA’s reduction of the 2023 yield estimate by 2.4 bushels per acre, with the national yield estimate now sitting at 175.1 bushels per acre. The yield cut translates to a 209 million bushel reduction in expected production, now estimated at 15.111 billion bushels, which would still be the 2nd largest corn crop on record. But projected corn usage is also getting smaller. Feed and residual usage shrank by 25 million bushels. The 20 million bushel corn sweetener reduction was extended into 2023. Projected
exports were lowered by 50 million bushels. Looking at 2023-24 ending stocks, the projection declined by 60 million bushels, but at 2.2 billion bushels, it’s still roughly 750 million bushels above 2022-23 and over 800 million bushels above 2021-22. The corn stocks-to-use ratio has grown from 9.2% in 2021-22 to 15.3% for 2023-24.

Figure 1 displays the state corn yield estimates. Drought has impacted this map since 2020, with the largest yield losses shifting around the country. In 2020, the Southern Plains suffered the brunt of the damage. In 2021, it was the Dakotas. In 2022, the Central Plains saw the largest cuts. Here in 2023, the drought impacts are straddling the Mississippi River. West of the Mississippi, it’s Missouri and Minnesota that are experiencing the largest corn yield declines. East of the Mississippi, the losses are showing up in Illinois and Wisconsin. Despite the continuing drought, 20 of the 32 states where USDA can estimate yield are looking at better yields than last year, with Indiana still on track to reach a record.

The story for soybeans is similar to that for corn. For the 2022 crop, USDA added 5 million bushels to imports, boosting 2022-23 ending stocks slightly. Adding to supplies, 2023 soybean imports were increased by 10 million bushels. However, with a drought induced reduction for the 2023 yield, total available supplies for 2023 fell. USDA dropped the 2023 national yield estimate by 1.1 bushels per acre, to 50.9 bushels per acre. That shaved 95 million bushels off of expected production. But just as corn experienced, the drop in production was partially offset by cuts in usage. 2023 soybean exports were lowered by 25 million bushels. That puts expected exports over 150 million bushels below 2022 and over 400 million bushels below 2020. In the end, 2023-24 ending stocks are projected at 245 million bushels. The soybean market remains tight with a stocks-to-use ratio slightly below 5.8%

The state yield impacts are also similar to corn. North Dakota and Wisconsin are seeing the largest declines. Iowa and Michigan join the list of states with lower yields. But the Central and Southern Plains and the Northeast are projected to have much better yields this year. Five states (Indiana, Ohio, North Carolina, Mississippi, and Arkansas) have a chance for record yields.

USDA will continue to update their weekly crop ratings and in September, they will begin their objective yield surveys, where they actually go out into fields, counting plants, ears, and pods. These pieces of information will provide a much richer picture of potential production. On the corn crop ratings, this year’s crop has been consistently rated below average and last year’s crop. However, the crop ratings did improve in the early part of July and have roughly caught back up to last year’s level. Recent rains across the Midwest may pull the crop rating back above last year, but it will likely not catch the average rating. Typically, between now and harvest, the percentage of the crop rated Good to Excellent will dwindle by an additional three percent. That would provide additional support for USDA to adjust corn yields lower once again.
The soybean ratings have moved like the corn ratings, reaching a low spot in late June and recovering a bit since then. While this year’s ratings have not risen to last year’s level yet, the recent rains do have a chance to improve the ratings enough to not only reach last year’s, but also catch up to the average. Between now and harvest, the Good to Excellent percentage typically falls another two percent. If this year’s ratings do catch up to the average, we could see USDA reverse some of the yield cut they took this month.

Given all of the changes in the USDA projections, they maintained their 2022 season-average prices where they were, $6.60 for corn and $14.20 for soybeans. For the 2023 crops, the smaller projected ending stocks led USDA to increase their season-average price projections. Corn shifted up 10 cents to $4.90 per bushel. Soybeans gained 30 cents to $12.70 per bushel. Futures market-based projections of those same prices reveal that the markets are mixed, with estimated prices in the $4.80 range for corn and $12.80 range for soybeans. While the drought continues to support prices, concerns about exports and the general economy have weighed down on prices. The 2022 crops will finish out a profitable year. The 2023 crops are battling around breakeven. Lower prices and the increases in production costs over the past couple of years have significantly reduced or eliminated crop margins. There will be some profitable windows within the 2023 marketing year, but the window will not be wide open as it has been over the last couple of years.

Watch the latest Market Outlook video, https://youtu.be/NbUUMx7xo7I, for further insight on outlook for this month.