INSIDE . . .

UPDATES

The following Information Files have been updated on extension.iastate.edu/agdm:

A3-42 Grain Harvesting and Handling (GH2) System Sizing Tool

C2-75 Farmland Value Survey – REALTORS® Land Institute

The following Videos and Decision Tools have been updated on extension.iastate.edu/agdm:

A1-10 Chad Hart's Latest Ag Outlook

A1-44 Supplemental Coverage Option (SCO) and Enhanced Coverage Option (ECO) Yield History for Iowa (Decision Tool)

A1-77 Carbon Markets (Video)

A1-77 Carbon Markets (Extended video version)

A3-42 Grain Harvesting and Handling (GH2) System Sizing (Decision Tool)

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

Big inventory swings in some hog states

By Lee Schulz, extension livestock economist
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USDA cannot collect every piece of data from every US hog producer to be able to simply add up inventories, pig crops and sows farrowing for each quarterly Hogs and Pigs report.

Instead, USDA's National Agricultural Statistics Service gathers data from a sample of producers of various sizes in states with various levels of hog production. The goal is to extract and compile, from the bundle of surveys, numbers that accurately reflect what is going on in US pork production.

NASS cannot simply "average" all of the survey numbers to estimate inventories and percent changes in inventories. Here's why.

Suppose you invest $1,000 in baseball cards. They rise 20% in value. Also suppose you invest $9,000 in cryptocurrency. It dips 20% in value. The simple average rate of return is zero. What is the weighted average return? The $1,800 loss on cryptocurrency overwhelms the $200 gain on baseball cards. You are down $1,600 on your $10,000 investment.

Figure 1. Percent change in breeding herd, Sept. 1, 2021 TO Sept. 1, 2022
Data source: USDA-NASS. Note: Individual State estimates not available for the 34 Other States (OS).
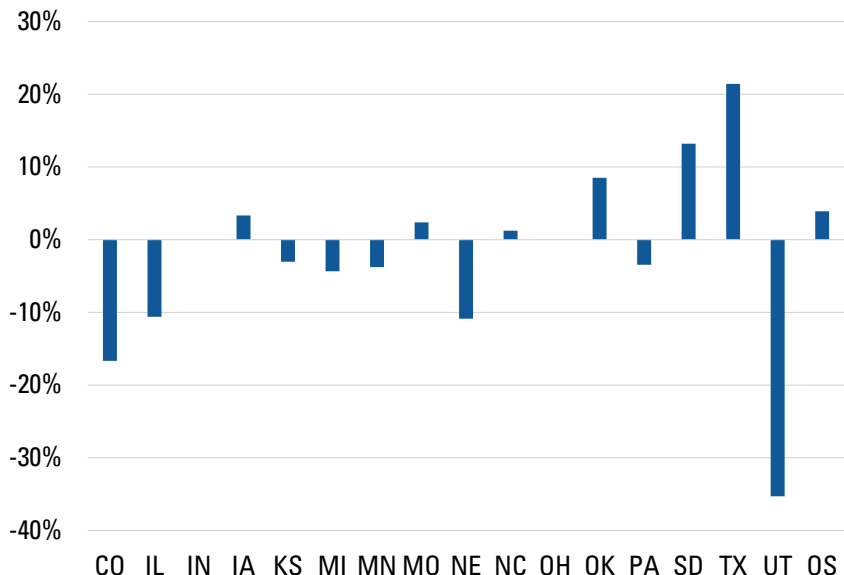
So the weighted average rate of return is negative 16%.

From producer surveys, NASS estimated the Sept. 1, 2022 national breeding herd inventory at 6.152 million head, down 0.6% from last year (Table 1). NASS tallied Utah's Sept. 1, 2022 breeding herd inventory at 55,000 head, down 30,000 head, or 35.3%, from last year (Figure 1).

So which percentage change is right? Odds are both are, with a bit more confidence that the national number is "more" right.

Sample size matters

NASS employs a "top-down" approach for hog inventory, pig crop and sows farrowing estimates. NASS first determines national estimates based on survey responses, slaughter data, balance sheet numbers, state recommendations and ratios of current year and quarter to previous year and quarter. Next, NASS reconciles state estimates to the national number. From a statistical perspective, larger sample sizes yield more precise results. Lumping samples from each state with the other states can generate fairly precise national estimates. Getting the national number "right" is most important as that is what drives market reactions.

Market analysts rarely forecast state-level inventories. Still, individual state numbers are important to the people in those states. They can provide early indications of changes in the local market that may be masked by aggregate, weighted average national numbers.

Cost changes drive decisions

Utah's hogs and pigs inventory is not large enough to alter national totals. But why did Utah's breeding inventory plunge 35.3%?

On June 10th of this year, Smithfield Foods announced plans to cease all harvest and processing operations at its subsidiary Farmer John plant in Vernon, California in early 2023.

Table 1. USDA quarterly hogs and pigs report summary. Source: USDA-NASS

	United States			Iowa		
	2021	**2022**	**2022 as % of '21**	**2021**	**2022**	**2022 as % of '21**
Sep 1 inventory *						
All hogs and pigs	74,867	73,800	98.6	24,100	23,400	97.1
Kept for breeding	6,190	6,152	99.4	900	930	103.3
Market	68,677	67,648	98.5	23,200	22,470	96.9
Under 50 pounds	21,690	21,343	98.4	6,010	5,680	94.5
50-119 pounds	20,211	19,887	98.4	7,760	7,760	100.0
120-179 pounds	14,246	14,073	98.8	5,470	5,200	95.1
180 pounds and over	12,529	12,345	98.5	3,960	3,830	96.7
Sows farrowing **						
Mar–May	3,034	2,988	98.5	510	505	99.0
Jun–Aug	3,050	3,018	99.0	505	500	99.0
Sep–Nov [1]	3,049	2,973	97.5	525	500	95.2
Dec–Feb [2,3]	2,919	2,902	99.4	475	485	102.1
Jun–Aug pigs per litter	11.13	11.13	100.0	11.40	11.60	101.8
Jun–Aug pig crop *	33,944	33,581	98.9	5,757	5,800	100.7

Full USDA report: https://downloads.usda.library.cornell.edu/usda-esmis/files/rj430453j/2f75sj094/z029qc565/hgpg0922.pdf

* 1,000 head; **1,000 litters; [1] Intentions for 2022. [2] December preceding year. [3] Intentions for 2022-23.

Vernon is the nearest city to Los Angeles. Smithfield harvested only company-owned hogs at the plant which mainly came from operations in Utah and Arizona. Smithfield's news release said that it would reduce its sow herd in Utah and was exploring strategic options to exit its farms in Arizona and California. The moves were said to be a result of escalating costs of doing business in California. The company said it would continue to serve customers in California with its Farmer John brand and other brands and products from existing facilities in the Midwest.

Smithfield is providing transition assistance to all employees affected by the moves, including relocation options to other company facilities and farms, as well as retention incentives to ensure business continuity until early next year. The unemployment rate in Los Angeles was 4.9% in August 2022. Workers looking for jobs in the area, likely have or will find them.

Breeding herd age matters
A sound culling strategy is an integral part of herd management. It maintains a steady flow, replacing the less productive sows on a regular basis, without disrupting the overall performance of the breeding herd. Producers voluntarily cull to remove sows identified as having sub-optimal performance. These sows may have shown farrowing difficulties, smaller litter sizes

Figure 2. Percent change in pigs saved per litter, Jun-Aug 2021 to Jun-Aug 2022. Data source: USDA-NASS. Note: Individual State estimates not available for the 34 Other States (OS).
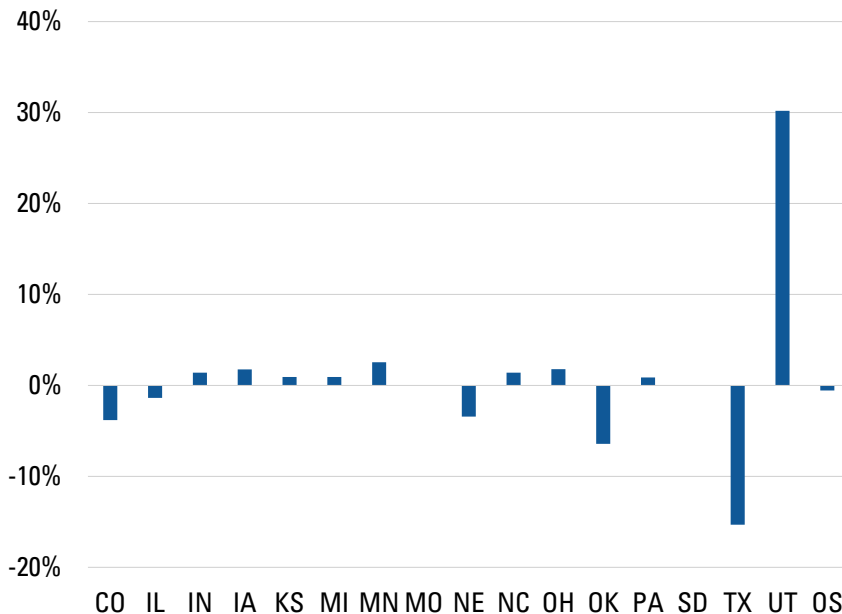
and lower productivity compared to the herd average. The deeper the voluntary cull, the greater the opportunity to boost per unit productivity, but at the expense of fewer units. This is what we have witnessed with the Utah breeding herd.

The June-August 2022 pig crop in the Beehive State, at 442,000 head, was down 9.4% from the previous year. Sows farrowing during the period totaled 32,000 head, down 30.4% from a year ago. The average pigs saved per litter was 13.80 for the June-August period, compared with 10.60 last year. That's an increase of 30.2% (Figure 2). The 13.80 pigs saved per litter is the largest litter rate for any state, in any quarter, ever.

In contrast to Utah, the Sept. 1, 2022 Texas breeding herd totaled 170,000 head, up 30,000, or 21.4%, from last year. The June-August 2022 Texas pig crop totaled

714,000 head, 6.8% below last year. Pigs per litter averaged 9.40 pigs, down 15.3% from the previous year. Sows farrowed during June 2022 through August 2022 totaled 76,000 head, up 10.1% from last year. Adding so many gilts changes the age distribution of the breeding herd. Before parity three, sows are generally less productive. Other factors are also likely driving the large change in productivity.

Oklahoma also saw a 40,000 head breeding herd rise from Sept. 1, 2021 to Sept. 1, 2022 with a 7.5% hike in sows farrowing in June-August 2022 compared to a year earlier, while the June-August 2022 litter rate fell 6.4%.

Sizable swings in litter rates
Collectively the 14 largest pig producing states had a June-August 2022 litter rate of 11.17 pigs compared to 11.16 pigs last year. Individual states

had much different year-over-year differences. For instance, Colorado's litter rate was down 3.8%, Nebraska's was down 3.4%, Illinois's was down 1.4% while Indiana's and North Carolina's were both up 1.4%, Iowa's and Ohio's were both up 1.8% and Minnesota's was up 2.5%. For Iowa and Minnesota, these increases led to record high pigs saved per litter for any quarter.

Monitoring disease impacts

The Swine Disease Reporting System includes multiple projects that aggregate data from participating veterinary diagnostic laboratories in the US and reports the major findings to the swine industry. The project is funded by the Swine Health Information Center. The goal is to share information on endemic and emerging diseases affecting the US swine herd, assisting veterinarians and producers in making informed decisions on disease prevention, detection, and management. The website dashboards provide an up-to-date **data source**, www.swinehealth.org/.

Pathogen detection and monitoring at the state level can help identify notable changes in hogs and pigs numbers. For example, on July 1, 2022, the one-third mark of the June-August 2022 quarter, the percent of positive PRRSV adult/sow farm cases in Iowa, Minnesota, and Ohio was more than three standard deviations below the baseline. On the other hand, the percent of positive PRRSV adult/sow farm cases in Missouri, Nebraska and South Dakota was over three standard deviations above the baseline.

Commercial slaughter and price forecasts

Table 2 contains the Iowa State University price forecasts for the next four quarters. Prices are for the Iowa-Minnesota producer sold weighted average carcass base price for all purchase types. Basis forecasts along with lean hog futures prices are used to make cash price projections. The table also contains the projected year-over-year changes in commercial hog slaughter.

Table 2. Commercial hog slaughter projections and price forecasts, 2022-2023

	Year-over-Year Change In Commercial Hog Slaughter (%)	ISU Model Price Forecast, IA-MN Base Price, All Purchase Types ($/cwt)	CME Futures (9/30/22) Adjusted for IA-MN Producer Sold Weighted Average Carcass Base Price for All Purchase Types Historical Basis ($/cwt)
Oct–Dec 2022	-1.13	77-81	78.18
Jan–Mar 2023	-0.80	78-82	79.42
Apr–Jun 2023	-1.67	88-92	88.95
Jul–Sep 2023	-0.28	90-94	91.08

Melting snow and ice raises sea level

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.

Melting land ice and warming oceans are two significant causes of sea level rise. In this article, we will discuss melting land ice. Next month, we will discuss the warming of the oceans.

Snow and ice floating in water, called sea-ice, covers much of the Arctic Ocean. The Arctic sea-ice has been melting rapidly in recent years, as discussed in **last month's newsletter article**, www.extension.iastate.edu/agdm/articles/hof/HofSep22.html. Although melting sea ice impacts the warming of the Earth, its impact on raising sea level is minimal.

To understand this, put an ice cube in a glass and fill the glass with water. Does the glass overflow when the ice cube melts? No, the water level in the glass is unchanged. That's because the volume of water displaced by the floating ice cube (the amount of the ice cube below water) is equal to the amount of water contained in the ice cube.

Conversely, melting snow and ice on land does raise sea level. For example, if a chunk of the ice covering Greenland breaks off and falls into the ocean, sea level rises.

It is like dropping an ice cube into a glass of water. The water level in the glass will rise by the amount of water the ice cube displaces in the glass, possibly causing the glass to overflow.

Similarly, if a portion of Greenland land ice melts and the water flows into the Arctic, sea level will rise. It is like adding water to the glass of water.

A complete melting of Greenland's land ice would raise sea level by about 24 feet. A complete melting of Antarctica's land ice would raise sea level by roughly 200 feet. Although this level of melting would take hundreds or thousands of years, it does show the potential impact of these land ice sheets on sea level.

Glaciers in parts of the world are being impacted. Scientific studies have confirmed that most of the world's glaciers are retreating. Most of the smaller ones are rapidly disappearing.

For example, in 1850 there were about 150 glaciers in what is now Glacier National Park. Today there are only 25. It is expected that the Park will become glacier-free sometime in the future.

Sea level is expected to rise in the future. Research on Antarctica indicates that significant sea rise may occur in the near future. NASA has stated that we are probably already locked into at least three feet of sea level rise.

Fifteen of the world's twenty megacities are vulnerable to sea level rise and increased coastal storm surges. More than half of the world's population lives within 35 miles of the sea. Recent research estimates that over 25% of the world's population live close enough to coastal areas and at a low enough elevation to be vulnerable to sea level rise, including more intensive storms and flooding.

Rising sea levels, even a small increase, can have devastating effects on our coastal areas. As seawater reaches inland it can flood freshwater wetlands, contaminate soils, cause destructive erosion, seep into freshwater aquifers and destroy wildlife habitat.

See the **Ag Decision Maker website**, www.extension.iastate.edu/agdm/energy.html#climate, for more from this series.

Export concerns

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

The projections for the corn and soybean markets have shifted dramatically over the past couple of months. The September and October USDA reports outlined several adjustments, incorporating new acreage information from the Farm Service Agency and new survey data from NASS's farmer and objective yield surveys. For both crops, USDA's new estimates indicate less acreage and less yield. The national corn planted area estimate was decreased by 1.2 million acres to a total of 88.6 million acres. The national average corn yield estimate dropped to 171.9 bushels per acre. Putting together the acreage and yield updates, USDA found evidence to reduce projected corn production by over 500 million bushels, moving below 14 billion bushels for the year. That puts this year's production over 1 billion bushels below the 2021 total, tightening corn supplies over the next 12 months. Similar supply changes were observed in the soybean market. Nationally, USDA reduced total planted area for soybeans by 600,000 acres, to 87.5 million acres. The national average soybean yield estimate came in at 49.8 bushels per acre, down 2.2 bushels over the past couple of months. Overall, the projection for national soybean production is 4.313 billion bushels, which

is a large crop, but not quite as large as last year.

USDA also updated corn usage, with cuts impacting the major usage categories. The recent slowdown in ethanol production translated into a decline in corn grind out for the 2021 crop. However, corn export sales out of the 2021 crop were increased and feed usage was larger with the drought. Given the September Grain Stocks report, USDA set the 2021-22 corn ending stocks at 1.377 billion bushels, well below previous estimates. The reduction in stocks allowed USDA to increase its 2021-22 season-average price estimate to $6.00 per bushel. For the new (2022) crop, feed and residual usage estimates fell by 50 million bushels, exports declined by 225 million bushels, and corn usage for ethanol was slashed by 100 million bushels. Overall corn usage is projected to be down by over 800 million bushels for the new corn marketing year. The 2022-23 ending stocks are now set at 1.172 billion bushels, down 216 million bushels from August and down 205 million bushels from last year. The 2022-23 season-average price estimate rose to $6.80 per bushel.

Soybean usage adjustments reduced mainly international consumption. For the 2021 crop, USDA lowered exports,

reflecting lower sales into China, along with reductions in seed and crush usage. Those changes boosted the 2021-22 ending stocks to 274 million bushels, so stocks rose, but the market remains tight. The 2021-22 season-average price estimate stayed at $13.30 per bushel. For the 2022 crop, the usage reductions spread and grew. The domestic crush expectation dropped by 10 million bushels. So while USDA still expects domestic usage to grow, they cut that estimated growth by 25%. The larger reduction shows up in exports, with 110 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 74 million from last year. However, the 2022-23 season-average price estimate slipped to $14.00 per bushel.

As the paragraphs above outline, the drought shrank the crops, but crop usage has retreated roughly as quickly. And the category with the largest sustained pullback for both crops is exports. For corn, USDA's projection show 2.15 billion bushels exiting the country from the 2022 crop. That would be 321 million bushels below last year's total and 597 million below 2020, an

over 20% reduction in exports over a couple of years. The early export sales data is sadly supporting those projections. Early sales are well off the pace of the last couple of years and are even below the five-year average pace. By the time the corn harvest reaches one-third complete, we usually have roughly 800 million bushels already sold to international markets. Over 2020 and 2021, those early sales exceeded a billion bushels. Currently, we are still below 500 million and the weekly rate of sales is not showing signs of improvement. While global corn supplies are smaller, the US market is relatively tighter than the rest of the world. Thus, US corn is having a rougher time competing for export sales.

That lack of competitive advantage is showing up in nearly every market. As Figure 2 shows, any growth in corn export sales is hard to find. Currently, Honduras is the only significant market that has purchased more corn at this point in the year compared to last year. But even that growth is tiny (it can't be seen in the chart as it is only 590,000 bushels). The largest decline is with China, continuing the reduction that started with the 2021 crop. Chinese corn purchases surged under the Phase 1 trade deal for the 2020 and 2021 crops. But as the deal approached its end date, sales to China declined quickly. Despite the fall in sales, China remains our second largest customer for corn (the

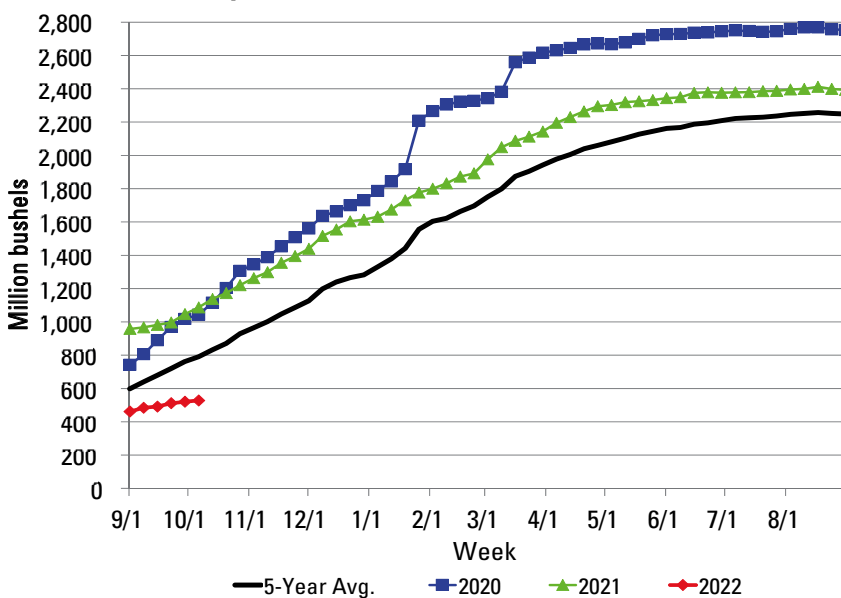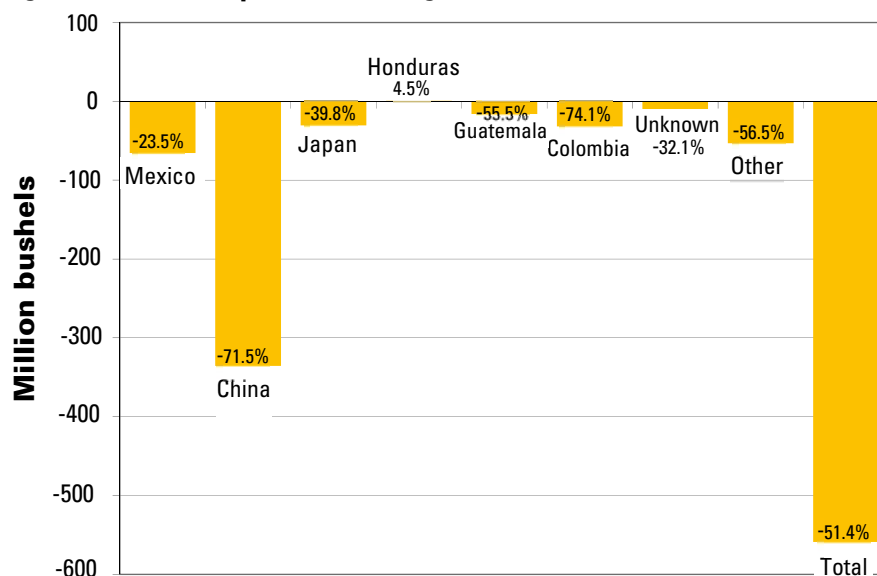**Figure 1. US corn export sales. Source: USDA-FAS.**

Figure 2. US corn export sales changes. Source: USDA-FAS.

countries listed in Figures 2 and 4 are the current top six markets for each crop, in order). While the Chinese shift explains a majority of the corn export loss, it is not the only major reduction. In fact, all of our major markets, with the exception of Honduras, are down by over 20%. If this continues, we can expect USDA to continue to cut the export projection further.

For soybeans, the general story on exports is similar, but the early data does look better. USDA's current export projection sits at 2.045 billion bushels. That is down 110 million bushels from a couple of months ago, is down 113 million from last year, and is down 221 million from 2020. So the soybean market is staring at a roughly 10% pullback in exports over two years. On a percentage basis, it is not as large as the fall in corn exports, but given the relative

dependence of soybeans on exports, it's a significant cut. US soybeans are facing increased competition as global supplies are at record levels and the US dollar continues to strengthen against currencies of both our competitors and customers. With that said, the early sales data has been somewhat encouraging. While sales are not nearly as strong as they were two years ago, they are running just ahead of last year's pace and the five-year average. And it's the five-year average line that we should monitor, as USDA's projection puts us right on the average line by the end of the marketing year.

Digging down into the country level data, the changes are relatively small, but it's our bigger customers that are showing year-over-year growth. While China represents the largest drop for corn, it is the largest gain for soybeans, reversing some of the decline from last year. Mexico and Japan are also in positive territory, but the gains are much smaller. We are seeing some losses in Egypt and the European Union, as they are likely sourcing what they can from Ukraine for now. The challenge will be to maintain this early positive pace, as Chinese crush margins have been weak over the past few weeks and competitors (especially Argentina) have been aggressive in the soybean market.

Over the past couple of months, the markets have been volatile in both directions. That has

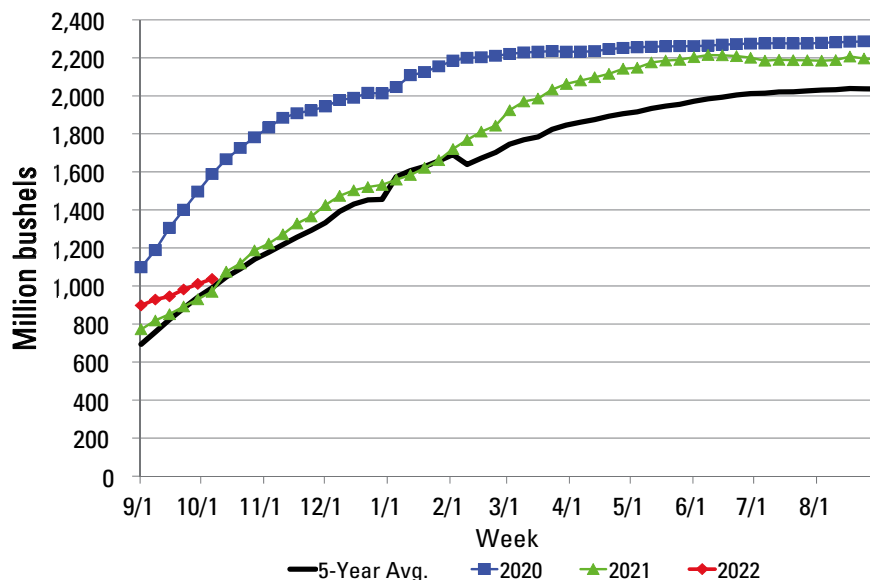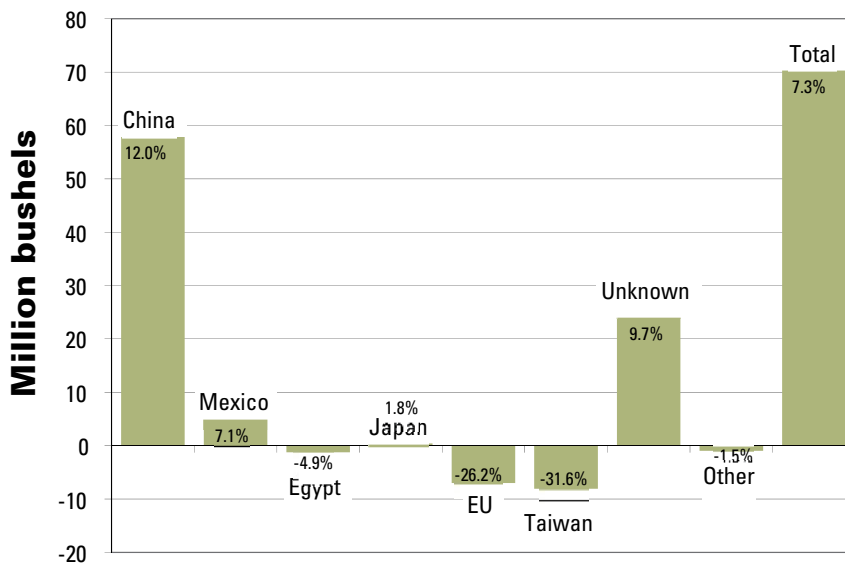Figure 3. US soybean export sales. Source: USDA-FAS.

Figure 4. US soybean export sales changes. Source: USDA-FAS.

meant crop prices have been treading water since August. The season-average price estimates based on futures have floated in the $6.50-6.75 range for corn and the $13.50-14.40 range for soybeans for some time now. They are not as high as they were in May, where corn topped out with a $7.40 projection and soybeans reached over $15. But they are also not as low as they were in July, with corn projecting at $5.50 and soybeans falling below $13. Thus far, traders are relying on the feeling that US crop supplies and usage are retreating at roughly the same pace. But as harvest winds down, supplies will be locked in. Then, these export sales will take on even more importance. And while soybean sales look to be in-line with projections, the corn market will need to see some additional purchases to reach expectations.

For more ag market outlook, **see this month's video**, https://youtu.be/WgoA1v9rAwc.

Pro ag outlook and management webinar series begins in November

Get updates on market and industry trends that will impact agriculture in 2023

By Ann M. Johanns, extension program specialist, 515-337-2766 | **aholste@iastate.edu**

Producers, ag lenders and suppliers can get a look at current market conditions and expected trends in crop and livestock income potential during the annual Pro Ag Outlook and Management webinar series, which begins Nov. 7.

Live webinars will be held daily Nov. 7-10, from noon to 1 p.m. Central time. A live question and answer session will follow each presentation. Programs will be available for on-demand viewing the day following each live broadcast. Only paid registrants will have access to the webinar recordings following the live events.

Agribusiness professionals, producers and others in the agricultural industry will benefit from hearing economic experts from Iowa State University address current and rising issues affecting Iowa agriculture. World events have had direct impacts on US producers in 2022 and attendees will gain insights and a better understanding of what to watch and prepare for going into 2023.

Speakers include Chad Hart, professor in economics and extension grain markets specialist at Iowa State; Alejandro Plastina, associate professor in economics and extension economist; Lee Schulz, associate professor in economics and livestock economist; and Bobby Martens, associate professor and ag supply chain specialist. All webinars will be moderated by Ann Johanns.

The program takes an in-depth look into the outlook for agriculture in 2023 and provides an opportunity to discuss the current Iowa economic situation with university experts.

Seminar dates and speakers

- Monday, Nov. 7. Alejandro Plastina provides an update on carbon markets and credits.
- Tuesday, Nov. 8. Lee Schulz provides an update on livestock outlook and profit potential for beef, pork and other Iowa industries.
- Wednesday, Nov. 9. Bobby Martens discusses logistics and transportation impacts on agriculture.
- Thursday, Nov. 10. Chad Hart discusses crop markets for 2023 and beyond.

Registration for the whole series is $20 per email address and includes access to the four live programs and archived recordings of each session. Register at: **https://www.aep.iastate.edu/proag/**

Viewing of the live and recorded programs is through a web browser and no additional software downloads are needed. Initial questions for the presenters can be sent to **agdm@iastate.edu**.