

Ag Decision Maker

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The following **Video** has been updated on extension.iastate.edu/agdm:

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The following **Profitability Tools** have been updated on extension.iastate.edu/agdm/outlook.html:

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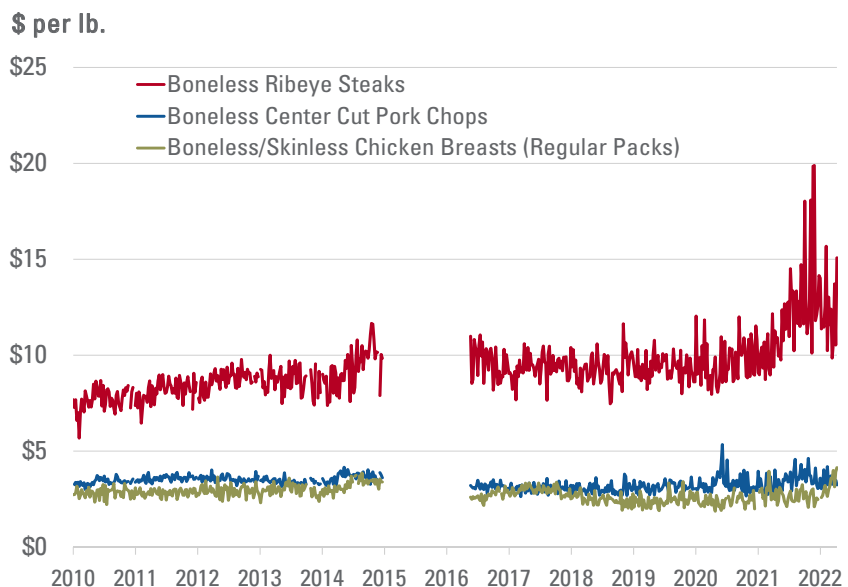
Consumers respond to meat price differences

By Lee Schulz, extension livestock economist
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Ribeye steaks are the most popular steak sold in the summer, according to the Beef Checkoff. Pork chops are the most popular cut of pork, according to the Pork Checkoff. Boneless center cut pork chops are sometimes called an "America's Cut." Two in five Americans say that the breast is their favorite cut of chicken, according to the National Chicken Council. Price comparisons among these cuts can offer notable insights into the meat market.

For the week of April 8 thru April 14, bone-in ribeye steaks averaged \$9.91 per pound at major retail supermarkets, according to the USDA National Retail Report–Beef, published by the Agricultural Marketing Service, Livestock, Poultry, and Grain Market News division. This was 19.8% higher than the same week last year. Boneless ribeye steaks were \$15.08 per pound, up 33.8% from 2021.

Figure 1. Advertised Prices at Major Retail Supermarket Outlets National, Weekly. Data source: USDA-AMS.



The equivalent, USDA National Retail Report–Pork, showed bone-in center cut chops at \$2.75 per pound, and boneless center cut chops at \$3.24 per pound. These advertised prices were up 16.5% and down 19.4%, respectively, compared to a year ago.

USDA's National Retail Report–Chicken, showed boneless/skinless chicken breasts in value packs (generally greater than 3 lbs.) averaged \$3.15 per pound this year compared to \$2.12 per pound during the second week of April 2021. This 48.6% price surge was larger than the price hike of regular packs (less than 3 lbs.), which, at \$4.14 per pound, were up 37.1% year over year.

Nominal dollar prices matter, but relative values are the important driver of consumer demand. Recall, demand for any good is a function of consumers' tastes and preferences, income levels (or budget constraints), and prices of competing substitute and complementary products.

Two views on price relationships

The Consumer Price Index (CPI) provides a wide-angle view on changes in prices consumers pay over time. The US Bureau of Labor Statistics releases the CPI each month. In March 2022, the *all items* index (not adjusted seasonally) was 8.5% higher than in March 2021. Core CPI inflation, which excludes food and energy, which tend to be volatile, was up 6.5%.

The food index was up 8.8%. Meats and poultry indices outpaced price hikes for most other goods, surging 14.8% and 13.2%, respectively, compared to March 2021. But two other essential expenditures reached even deeper into consumers' wallets, with transportation up 22.6% and energy rocketing 32.0% higher.

We can focus on meat and poultry by looking at relative values using any cut as the base. Using boneless ribeye steak as a base is a straightforward, relative value comparison. Boneless ribeyes are more expensive than both boneless center cut pork chops and boneless/skinless chicken breasts in regular packs.

The challenge for beef is clear: beef's price is rising relative to beef's two main competitors. From 2016 through 2020 boneless ribeye steak prices averaged 3.7 times the prices of boneless/skinless chicken breasts in regular packs, up from 2.7 times in 2010. From 2016 through 2020 boneless ribeyes averaged 3.0 times the prices of boneless center cut pork chops, up from 2.3 in 2010.

From another angle, 2016 through 2020 prices of boneless/skinless chicken breasts in regular packs averaged 27.7% of boneless ribeye steak prices. Boneless center cut pork chop prices averaged 33.4% of boneless ribeye steak prices. Those percentages were some of the lowest pork and chicken prices relative to beef on record.

Boneless ribeye steak prices increased at a faster pace during 2021. Prices of boneless/skinless chicken breasts in regular packs averaged 23.2% of boneless ribeye steak prices. Boneless center cut pork chop prices averaged 29.9% of boneless ribeye steak prices.

So far in 2022, relative prices for boneless/skinless chicken breasts in regular packs are back to recent averages at 27.3% of boneless ribeye steak prices, closely matching the 2016 to 2020 period. Boneless center cut pork chops have remained more competitive with ribeyes. This year, pork chop prices have averaged 28.8% of boneless ribeye steak prices, similar to last year.

A major reason for the surge in both absolute and relative prices of boneless ribeye steaks—and beef in general—is strong consumer preferences. Beef's price hikes are larger than the supply levels would typically dictate. People are creatures of habit: we buy many things because we like them. We change only when something major, such as a significant change in relative cost, causes us to reconsider our habitual purchases. Recalibrating our purchasing behavior in response to new price relationships takes time. Also, after a year of pandemic-related life style disruptions, people were busting at the seams for some normalcy and needed to celebrate—and beef is a celebration food.

How much will consumers switch?

At some point, beef prices may get so high relative to pork and poultry that even the most ardent beef lovers will shop around. Economists have tools to predict the possible magnitude of switches.

Cross-price elasticity of demand measures how much the quantity demanded of one product changes in response to a change in the price of another product. For example, say the cross-price elasticity for beef with respect to the price of chicken is 0.05. That means a 1% decrease in the price of chicken decreases quantity demanded of beef by 0.05%. Expanding the decimal point, a 20% dip in chicken prices relative to beef prices should only shave quantity demanded of beef by 1%. That relationship assumes all else holds constant.

A positive cross-price elasticity means that products are substitutes, chicken for beef for example. A negative cross-price elasticity means that products are complements. Vegetables, grains, potatoes, and sauces (think barbecue sauce or applesauce for pork) are complementary goods to meat. However, the quantity demanded of meat is generally not very responsive to changes in the prices of these complementary products. The logic, consumers purchase a desired meat (beef, pork, or chicken) first and then choose a side dish or ingredients to accompany their choice of meat.

Own-price elasticity of demand measures the responsiveness in the quantity demanded of a product to a change in its own price. For example, an own-price elasticity for beef of -0.86 means that a 1% increase in the price of beef decreases quantity demanded of beef by 0.86%, all else equal. A 20% price increase would shave quantity demanded by 17.2%. A product is said to be price inelastic—not responsive to price—when the absolute value of its own-price elasticity is less than 1.0.

Some demand elasticities published in academic and government research are based on data that are 30-75 years old. More recent research suggests it now takes a larger price hike of beef over pork and poultry to entice consumers to switch. That is, beef is becoming more cross-price inelastic. Willingness of consumers to keep buying increasingly pricey beef suggests beef is becoming more price inelastic to changes in its own price. Both measures becoming more inelastic reflect rock solid consumer demand for beef.

Versatility complicates analysis

So far we have discussed substitution across meats: beef versus pork, beef versus chicken, or pork versus chicken. Other relative prices are also important. Meat and poultry products are highly versatile,

and something is available for everyone on any budget. Consumers can interchange cuts in several recipes.

Even within cuts, relative prices matter: consider bone-in versus boneless. Cuts with the bone left in are typically less expensive. Bone-in cuts often provide the most flavor, but trade-offs exist. The bone and higher fat content mean less edible meat and gauging serving sizes can be more difficult, plus fat and bone may require more work to “get to the meat of the cut.” Bone-in cuts can take a little longer to cook. Bone-in options may not be pre-packaged as readily, so consumers might need to pay a visit to a grocer’s meat counter or a butcher to find them.

Long-run averages suggest bone-in cut prices are about 85% of their boneless equivalents for ribeye steaks and center cut pork chops. Value pack prices of boneless/skinless chicken breasts are 80% that of regular packs. These relative prices can change dramatically from week to week. Consider in 2022 alone: bone-in prices for some weeks have been roughly at par with boneless prices. Other weeks they have been as low as 65%. The same goes for value packs of boneless/skinless chicken breasts versus regular packs. Prudent consumers continually scrutinize weekly meat and poultry features to get the most meat for their food dollars.



Has the earth's climate changed before?

By Don Hofstrand, retired agricultural business specialist

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

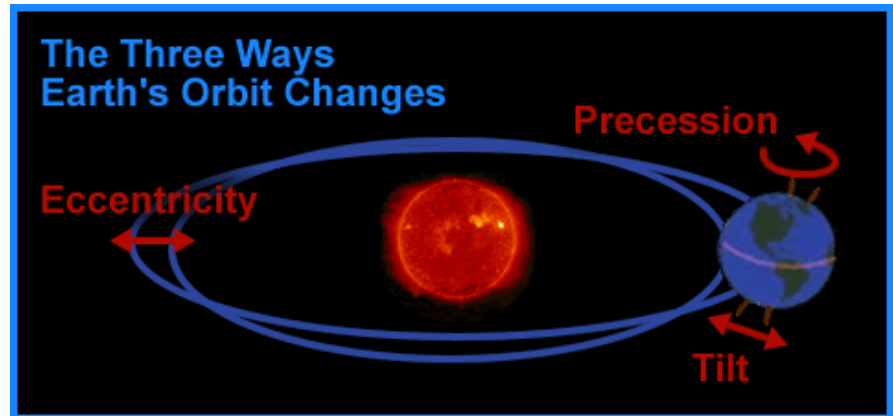
This article is part of our series focused on the causes and consequences of a warming planet.

The earth's climate has changed many times over its long history. Two of the major causes of these changes are the shifting of the earth's land masses and variations in the position of the earth relative to the sun.

The earth's crust is composed of tectonic plates which cause continents to drift. Millions of years ago there was just one huge continent called Pangea. Due to shifting tectonic plates, this huge land mass gradually broke apart forming the continents we see today. These changes impacted the earth's climate.

As continents moved toward the poles, snow and ice collected on the land. The white surface reflected most of the sunlight back into space leaving little light to be absorbed by the earth as heat. As the land moved towards the poles, the poles became colder.

At one time, South America and Antarctica were connected. When they broke apart, it allowed an ocean current to form that circled Antarctica. The ocean current blocked warm Equatorial water from reaching Antarctica resulting in the cooling of Antarctica and the development of an ice sheet over the continent.



Source: Windows to the Universe Original

Slight variations in the position of the earth relative to the sun impact temperature because of the change in the amount, angle, and timing of sunlight striking the earth's surface. The climatic movement of the earth in and out of ice ages is partially due to these variations.

The orbit of the earth around the sun is not an unchanging circle. Rather, it is an ellipse that gradually changes in shape over time. This variation in the earth's orbit causes a change in the distance from the earth to the sun and impacts the amount of sunlight reaching the earth's surface.

Another variation is the tilt of the earth's axis relative to the sun. The tilt changes slowly over time, varying from 22-25 degrees. A change in the earth's tilt impacts the angle at which sunlight strikes the earth's surface.

A third variation is a very slow wobble of the earth's axis. The wobble is similar to that of a spinning top. If we were to look into the night sky 13,000 years ago, we would see the North Star but it would be a different star than it is today because of the earth's wobble.

Although the earth's climate has changed before, these changes have occurred over extremely long periods of time. They have virtually no impact on the rapid changes in temperature and climate the earth has experienced.

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



Hogs and pigs inventory contraction continues

By Lee Schulz, extension livestock economist
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The US inventory of all hogs and pigs on March 1, 2022 was 72.209 million head, down 2.3% from a year ago and down 2.6% from December 1, 2021 (Table 1). There were 23.0 million hogs and pigs on Iowa farms, down 2.5% from a year ago and down 3.4% from last quarter.

The US breeding herd inventory, at 6.098 million head, was down 1.9% from last year and down 0.4% from the previous quarter. The Iowa breeding inventory, at 900,000 head, was down 4.3% from last year and down 2.2% from last quarter. This was the

smallest March 1 Iowa breeding ever in the history of the data back to 1963. The 900,000 head of Iowa sows, gilts, and boars ties September 2021 for the smallest breeding herd inventory of any quarter. Iowa has 14.8% of the national breeding herd.

The US market hog inventory, at 66.111 million head, was down 2.4% from last year and down 2.8% from last quarter. The Iowa market hog inventory, at 22.100 million head, was down 2.5% from last year and down 3.4% from last quarter. Iowa has 33.4% of the national market hog inventory.

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 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
Mar 1 inventory *						
All hogs and pigs	73,933	72,209	97.7	23,600	23,000	97.5
Kept for breeding	6,215	6,098	98.1	940	900	95.7
Market	67,718	66,111	97.6	22,660	22,100	97.5
Under 50 pounds	20,238	20,045	99.0	5,340	5,440	101.9
50-119 pounds	19,138	18,765	98.1	7,210	7,150	99.2
120-179 pounds	15,375	14,833	96.5	5,650	5,390	95.4
180 pounds and over	12,966	12,468	96.2	4,460	4,120	92.4
Sows farrowing **						
Sep–Nov	3,165	3,012	95.2	560	520	92.9
Dec–Feb ¹	2,929	2,901	99.0	485	475	97.9
Mar–May ²	3,034	2,988	98.5	510	485	95.1
Jun–Aug ²	3,050	3,031	99.4	505	505	100.0
Dec–Feb pigs per litter	10.94	10.95	100.1	11.30	11.30	100.0
Dec–Feb pig crop *	32,059	31,750	99.0	5,481	5,368	97.9

Full USDA report: <https://downloads.usda.library.cornell.edu/usda-esmis/files/rj430453j/vd66x375g/df65wc745/hgpg0322.pdf>

* 1,000 head; **1,000 litters; ¹ December preceding year. ² Intentions for 2022.

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

	Year-over-Year Change In Commercial Hog Slaughter (%)	ISU Model Price Forecast, IA-MN Base Price, All Purchase Types (\$/cwt)	4/1/22 CME Futures Adjusted for IA-MN Producer Sold Weighted Average Carcass Base Price for All Purchase Types Historical Basis (\$/cwt)
Apr-Jun 2022	-2.96	109-113	111.16
Jul-Sep 2022	-1.54	108-112	109.80
Oct-Dec 2022	-0.17	88-92	90.16
Jan-Mar 2023	0.50	87-91	89.33



Custom rate survey shows average costs of common farming practices

By Alejandro Plastina, extension economist, 515-294-6160 | plastina@iastate.edu
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Many Iowa farmers hire some custom machine work in their farm business or perform custom work for others. Others rent machinery or perform other services.

In order to help producers and custom operators examine the market, Iowa State University Extension and Outreach publishes the [Iowa Farm Custom Rate Survey](https://extension.iastate.edu/agdm/crops/pdf/a3-10.pdf), extension.iastate.edu/agdm/crops/pdf/a3-10.pdf.

This year’s survey, published in March, includes 122 responses and nearly 3,400 custom rates for tasks related to tillage, planting and seeding, spraying, harvesting, farm labor and more.

Most custom rates saw an increase of 3-10%. The cost for labor increased almost 14%, reflecting the challenges of a

tight labor market nationwide.

Custom planting ranges from \$11 to \$40 per acre, depending on the type of planter and setup. Combining corn shows an average of \$36.75 per acre and combining soybeans averages \$36.05 per acre.

Some costs have already trended higher, due to increases in diesel and fuel prices since the survey was issued. The survey assumed diesel prices would be \$3.33 a gallon in 2022, based on forecasts from the US Energy Information Administration. The survey may lag increases in diesel prices and other inputs in some areas. This means that for custom farming practices that involve these inputs, the cost may be even higher.

The information in the survey is meant to be a starting point for farmers and agribusiness to engage in conversations and negotiations. The survey is not meant to set the rate for a particular practice or operator. This is an opinion survey and represents the responses of participants.

This survey is only possible with the participation of Iowa farmers, custom operators and farm managers. To join the survey list for 2023, email the survey authors.

For more information, Plastina can be reached at 515-294-6160 or plastina@iastate.edu, and Ann Johanns can be reached at 515-337-2766 or aholste@iastate.edu.



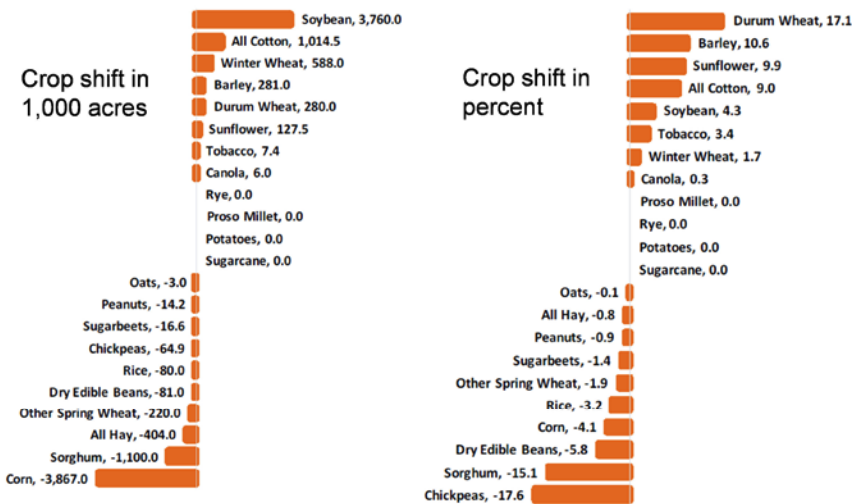
Global adjustments in agriculture

By Chad Hart, extension crop market economist
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The war in Ukraine has impacts well beyond the Black Sea region. Agricultural markets worldwide have been adjusting ever since the Russian invasion began. But the war is not the only issue pressuring ag markets. In fact, the war's impact is only amplifying some signals that were already affecting production and marketing decisions. The latest USDA reports, the [March Prospective Plantings report](https://nass.usda.gov/Publications/Todays_Reports/reports/pspl0322.pdf), nass.usda.gov/Publications/Todays_Reports/reports/pspl0322.pdf, and the April [World Ag Supplies and Demand Estimates \(WASDE\) report](https://usda.gov/oce/commodity/wasde), usda.gov/oce/commodity/wasde, outline many of the ways global agriculture is shifting to factor in not only the war, but also the continuing problems with global supply chains and the higher costs of almost everything.

Arguably, the Prospective Plantings report was much more about the supply chain issues and higher input costs than about a farmer response to the war. While the war is a contributing factor to higher ag input costs, especially fertilizer, those input costs were already very high before the war. Global supplies of fertilizer were limited prior to the conflict and those supplies have become even more limited with the economic sanctions on Russia

Figure 1. US crop acreage shifts. Source: USDA NASS.



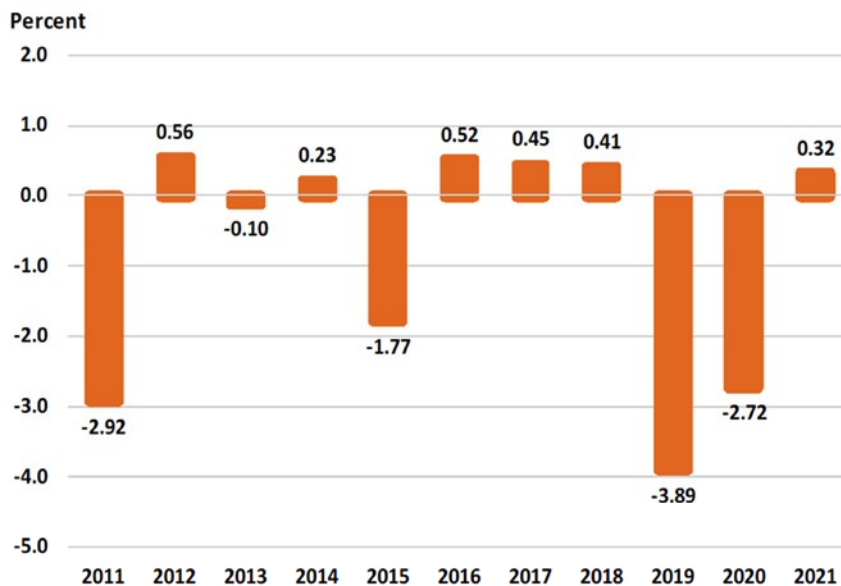
and Belarus (two of the world's largest fertilizer exporters) and the decision by China to restrict fertilizer exports. The threat of higher production costs sent US farmers looking for lower cost crops to plant. As Figure 1 shows, many farmers turned to soybeans as the crop of choice. The left side of the figure shows the shift in crop area in the number of acres, while the right side of the figure shows the percentage change in crop area. In terms of total area, soybeans gained nearly 4 million acres, while corn lost roughly the same amount. Along with soybeans, cotton, winter wheat, barley, durum wheat, and sunflowers gained significant area. Meanwhile, sorghum, hay, and other types of spring wheat lost area.

Looking across all of the major crops, the amount of land in crop production is remaining fairly steady as the gains and losses basically offset each other. This result was surprising given the strength of crop prices over the past few months. Historically, when crop prices are high, we see additional land come into crop production. For example, during the last run of crop prices like we are experiencing now (2011-2012), principal cropland area jumped from 314 million acres in 2011 to 324 million acres in 2012. This year, principal cropland area increased by just 200,000 acres. We are not likely to see more cropland added by the time the June acreage survey comes. Figure 2 shows the percent change in principal cropland between the two big

USDA acreage surveys (March Prospective Plantings and June Acreage reports). As the data for the last 11 years indicates, when planting conditions are good, farmers plant a few more acres than originally intended, but the bigger adjustments tend to come when weather impacts planting progress and fewer acreage get planted. While the war has created additional pressure on global crop area and supplies, US area didn't react as much as usual due to higher production costs.

But acreage and supplies are not the only adjustments occurring in global agriculture. The war in Ukraine has also significantly impacted the flow of ag products across the globe. Countries that depend on the Black Sea region for their crop needs are now looking for other sources to fill those needs. For example, the countries in North Africa and the Middle East purchase a lot of the crop and oilseed production from southern Russia and Ukraine. The war has essentially shut off those trade flows and has sent those countries searching for different suppliers. The US is capturing some of those shifts. But the largest country to watch as the world adjusts to the war will be China. Prior to the outbreak of the war, Chinese purchases of many commodities from the US had been declining. However, over the past several weeks, Chinese interest in US crops has gained some steam. USDA's projections for exports from the 2021 corn

Figure 2. Percent change in principal cropland between March and June surveys. Source: USDA NASS.



and soybean crops have been boosted in the last two WASDE reports. Figures 3 and 4 display the export patterns we have experienced over the past two and one-half years, along with a line for the five-year average level of crop exports. For corn, the 2020 marketing year set the record for export quantities. China led the charge, becoming our largest corn customer with significant purchases throughout the 2020 and 2021 calendar years, lining up the Phase 1 trade deal. However, as the specific targets under the Phase 1 trade deal ended with the calendar year, Chinese purchases fell and the export pace for corn fell below last year's level. The gap between the years had been widening until the Russian invasion. Since then, the gap has shrunk slightly, but the expectation is that the gap will continue to shrink, with more purchases coming from China, North Africa, and the Middle East.

While corn exports are slowly gaining, soybean exports have been more robust. Like with corn, the export pace before the war had cooled, with China being the major change agent. Over the past decade, China has been the largest market for US soybeans, representing roughly 60% of our exports over the past few years. The soybean market has worked through the dramatic swings in the US-China trade relationship. The trade/tariff war in 2018 and 2019 had cut soybean exports significantly. The signing of the Phase 1 trade deal allowed sales to rebound and reach new highs, with the 2020 marketing year being the top year for soybean export quantities. However, as was true with corn, the export pace early in the 2021 marketing year was lower, as China pulled back, putting export sales around the five-year average. But since the start of the war, soybean sales, especially to China, have ramped up.

USDA has bumped its export projection up by 65 million bushels over the past couple of months.

As the world reacts to the events in Ukraine, the impacts on US agriculture have been mixed. The war has created issues that are forcing already high production costs higher. But the war is also providing reasons for strong crop prices to remain. Usually, the export markets are the first to decline when crop prices move higher. However, the concerns about limited ag production and export potential from the Black Sea region have global customers moving quickly to secure supplies. The higher prices have not yet discouraged international sales. A major concern for farmers has been whether prices would fall just as production costs have risen to meet them. The strength in the export markets suggests that the higher prices today will stick around for a while and cover those production cost increases as we work through the upcoming growing season.

Figure 3. Corn export sales. Source: USDA FAS.

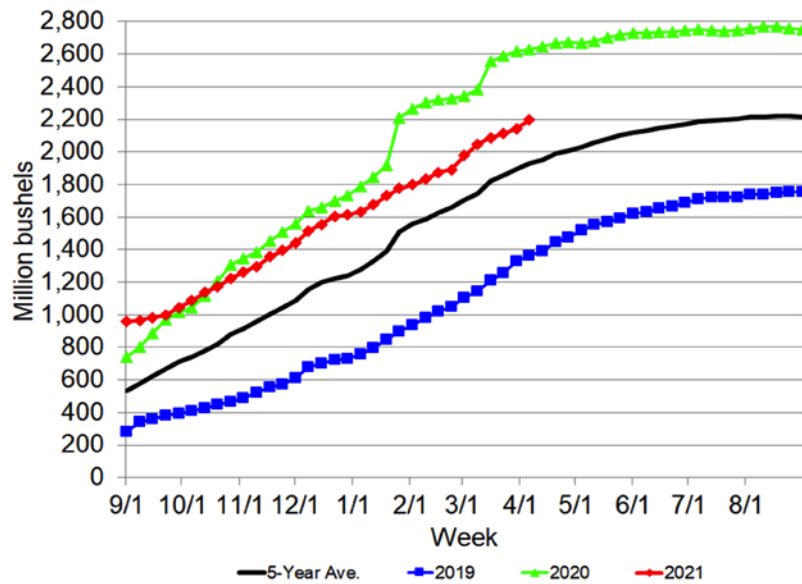
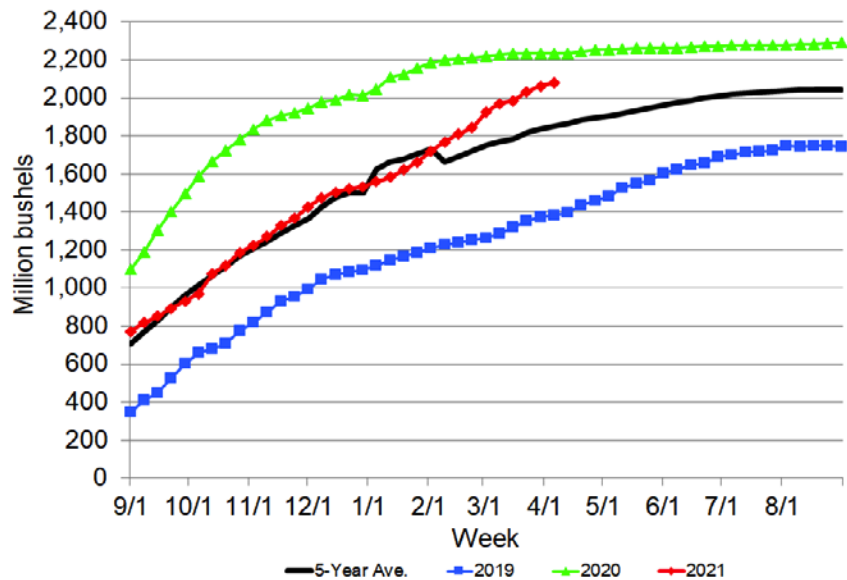


Figure 4. Soybean export sales. Source: USDA FAS.



Listen to the [April 2022 Crop Market Outlook video](https://youtu.be/GQKJyRWGprQ), <https://youtu.be/GQKJyRWGprQ>, for further insight on outlook for this month.

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

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