

Ag Decision Maker

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A1-12 Historical Corn Yields by County

A1-13 Historical Soybean Yields by County

A1-14 Corn and Soybean County Yields

A2-05 Crop Marketing Terms

A2-40 Corn and Soybean Price Basis

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The following [Video](#) has been updated on extension.iastate.edu/agdm:

A1-10 Chad Hart's Latest Ag Outlook

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

A1-85 Corn Profitability

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Ukraine, Russia, and Crops

By Chad Hart, extension crop market economist

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The crop markets were already on a tear before the outbreak of the Russian-Ukrainian war, and the war provided more support for higher, and more volatile, prices. The conflict has significant implications for old crop and new crop pricing, along with impacts on ag input costs. Let me start with that last item first. The war and the economic sanctions being imposed on Russia has redoubled the pressure on the global fertilizer market. While the US currently does not import fertilizer from Russia, many countries in Europe and South America do. Global fertilizer supplies had already been limited due to a number of factors, including export restrictions imposed by China and Russia, economic sanctions on Belarus, and the curtailing of fertilizer production in Europe given the very high natural gas prices there. All of these events preceded the Russian-Ukrainian war and fed into the high global prices for fertilizer this past fall. The fallout from the war will continue to limit global fertilizer supplies and support high natural gas prices, leading to continued

high prices for fertilizer. Thus, crop production costs are rising dramatically, but crop prices have as well.

The crop most directly impacted by the war is wheat, specifically winter wheat. Russia and Ukraine produce roughly one-seventh of the world's wheat (Table 1). Both countries are major exporters of wheat. In 2021, Russia's wheat crop was smaller as production issues hampered winter wheat. Ukraine, on the other hand, saw a sizable boost to their wheat production. In total, world wheat production increased very slightly with the 2021 crop, leading to a tightening of the wheat market as wheat consumption continues to grow. The war exasperates this, as the fight and the associated sanctions lock up and potentially remove some Black Sea wheat from the global market. The war also impacted the upcoming 2022 crop as the vast majority of Russian and Ukrainian wheat was planted in the fall. Roughly 70% of Russia's wheat and 97% of Ukraine's wheat is winter wheat. So the war is likely damaging those crops and reducing expected production in the Black Sea region.



But wheat is not the only crop market impacted. Both the corn and soybean markets have also been pressured by the war. For soybeans, the pressure is indirect. While Russia and Ukraine are not major soybean producers, they are major sunflower producers. In fact, the two countries export roughly 80% of the global trade total in sunflower oil. And given the substitutability of vegetable oils, all of the oilseed markets, including soybeans, have reacted to the war. The corn market has felt both direct and indirect impacts from the war. The indirect impacts result from the competition between corn and wheat in the global feed markets. The direct impacts come from the growing supplies of corn originating from the Black Sea region. Both Ukraine and Russia have been increasing corn production over the past decade, with most of the production heading to the export markets. Over the past year, USDA had signaled that Ukraine was poised to capture a larger share of corn exports to China. The war has essentially blocked those crop movements.

Prior to the start of the war, old crop winter wheat prices (represented by the Chicago and Kansas City markets) had been relatively flat in the early part of 2022. Spring wheat prices (represented by the Minneapolis market) have actually worked a bit lower. The impacts of the drought in South America had boosted soybean prices, while corn split the difference between the soybean and wheat markets,

Table 1. World wheat production. Source: USDA-WAQB.

Country or Region	2020-2021 estimate	2021-2022 forecast	Change from February 9	Change from 2020-2021
<i>Million tons</i>				
World	776.0	778.5	2.1	2.5
United States	49.8	44.8	--	-5.0
Foreign	726.3	733.7	2.1	7.5
Argentina	17.6	20.5	--	2.9
Canada	35.2	21.7	--	-13.5
Australia	33.3	36.3	2.3	3.0
European Union	126.9	139.0	0.1	12.1
Turkey	18.2	16.3	--	-2.0
Russia	85.4	75.2	-0.3	-10.2
Ukraine	25.4	33.0	--	7.6
Kazakhstan	14.3	11.8	--	-2.4
China	134.2	136.9	--	2.7
India	107.9	109.6	0.1	1.7
Northwest Africa	7.5	12.4	--	4.9

Table 2. World corn production. Source: USDA-WAQB.

Country or Region	2020-2021 estimate	2021-2022 forecast	Change from February 9	Change from 2020-2021
<i>Million tons</i>				
World	1,123.3	1,206.1	0.8	82.9
United States	358.4	383.9	--	25.5
Foreign	764.8	822.2	0.8	57.4
Argentina	51.5	53	-1.0	1.5
Brazil	87.0	114.0	--	27.0
Mexico	27.3	27.6	--	0.3
Canada	13.6	14.0	--	0.4
European Union	67.1	69.8	-0.2	2.7
Serbia	8.1	6.2	--	-1.9
FSU-12	48.9	63.2	0.1	14.3
Ukraine	30.3	41.9	-0.1	11.6
Russia	13.9	15.2	0.2	1.4
South Africa	17.0	16.3	-0.7	-0.7
China	260.7	272.6	--	11.9
India	31.7	32.5	2.5	0.9

with soybean prices up roughly 20% and corn prices up 10% prior to the war. As the Russians invaded, old crop prices initially jumped in unison, with winter wheat prices passing corn and catching up to soybeans in percentage terms, before falling back during the first weekend of the war. Since then, price volatility has been experienced in both directions. All wheat prices spiked higher in the first week of March, with Chicago wheat futures peaking 70% higher than at the first of the year. KC wheat prices were 60% above the initial prices of the year, while Minneapolis wheat rose 25% higher. Corn prices moved somewhat higher as well, while soybeans saw the smallest shift.

However, as the war continues and cease-fire talks start and stop, the wheat markets have cooled. As of March 11, 2022, winter wheat prices still have seen the largest percentage gains, with Chicago up 45% and KC up 38%. Old crop corn futures are nearly 30% higher, while old crop soybeans are up 22% and spring wheat is 11% higher.

The jumps in new crop prices haven't been quite as large, but they have made the acreage discussion for 2022 much more interesting. As with old crop prices, the various wheat prices had been trailing corn and soybean prices in the early part of 2022. As the reports on South American production declined, corn and soybean prices worked higher throughout February. The war shot new crop winter wheat prices past corn and soybeans in relative terms, with spring wheat bouncing higher for a brief time, before falling back. New crop Chicago and KC wheat futures are currently 33% higher than the start of the year. New crop corn futures are 20% higher, with soybeans and Minneapolis wheat up roughly 15%.

The big swings in prices have created issues along the marketing chain for crops. Some merchandizing locations have pulled spot bids temporarily, while other locations moved their base of their bids from the nearby futures contract (March) to deferred contracts (mainly May), in an effort to reduce cash price volatility and find a better buyer/seller balance (while many folks like to sell \$7.50 corn, many others do not like to buy it). As the real impacts of the war on

Figure 1. May futures price indices. Sources: CME and MGEX.

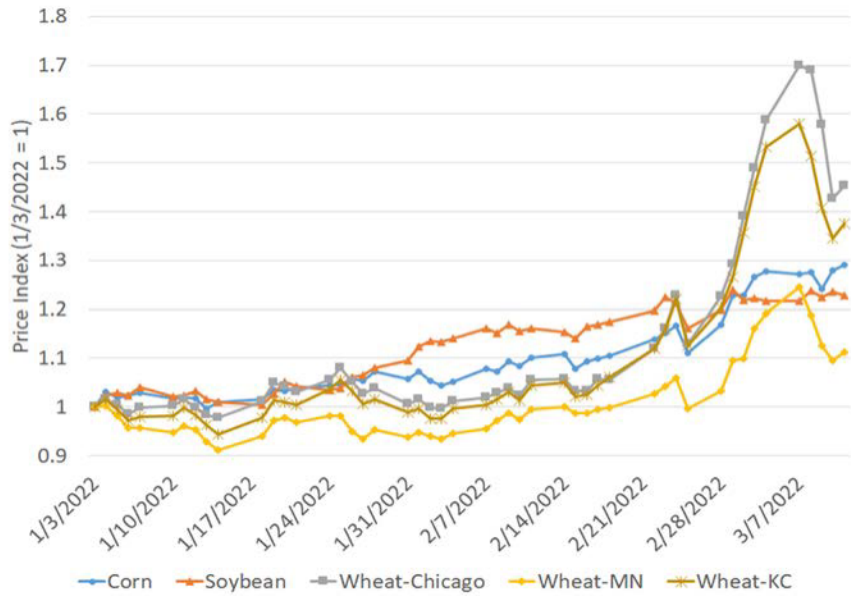
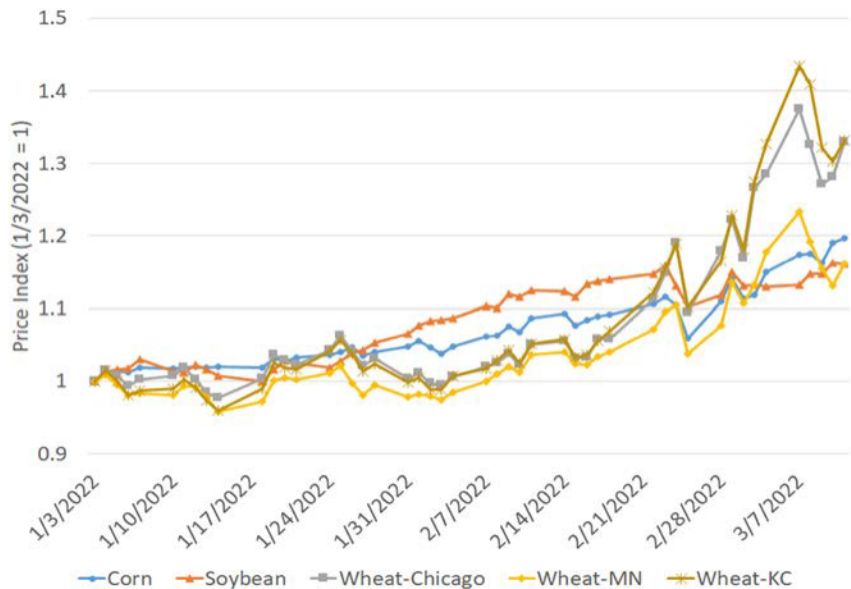


Figure 2. November/December futures price indices. Sources: CME and MGEX.



crop markets are revealed, the price volatility should slowly decline. But until then, producers and end users should expect a bumpy ride. The advantage to crop producers is that the federal crop insurance prices captured some of the heightened prices, with the revenue insurance products having the second highest corn price ever and the highest soybean price ever. Producers have a myriad of opportunities to lock in some of the best prices in roughly ten years, with old crop corn cash bids north of \$7 per bushel and new crop corn bids above \$6 per bushel and similar pricing for soybeans. For those that were able to lock in their input costs this fall, these prices offer significant profit potential. For those who were not able to lock in those costs, the prices are likely still robust enough to provide a profit, but the cost squeeze is definitely building up.

Listen to the [March 2022 Crop Market Outlook video](https://youtu.be/lomhPgiS040), <https://youtu.be/lomhPgiS040>, for further insight on outlook for this month.



Some quirks but typical beef market trends expected

By Lee Schulz, extension livestock economist
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On April 20, 2020, expiring May 2020 West Texas Intermediate crude futures settled at negative \$37.63 a barrel. This was the first time in history the price of US oil turned negative. This was part quirk, part supply and demand driven. Futures contracts that required buyers to take delivery of oil in May 2020 were expiring the following day. Nobody wanted the oil because there was no place to store it. Demand for oil was collapsing. Refineries were unwilling to turn oil into gasoline and other products because so few people were using it.

The meat market also has idiosyncrasies. On February 22, 2022 the Choice boxed beef cutout was at a \$2 per cwt discount to the Select cutout (Figure 1). This was the nineteenth time this daily inversion has happened since 2004 when USDA's Agricultural Marketing Service began reporting the data in its current form. This particular negative Choice-Select spread, however, was the largest over the period.

Individual prices for specific cuts ultimately drive cutout values and differences in the Choice-Select spread. On February 22, 2022, the Choice value for chuck, brisket, and round traded at a notable \$1.80, \$2.21, and \$6.00 discount, respectively, to the Select value. Choice quality grade

loins were discounted \$1.98 to Select quality grade loins, a stark contrast to typical pricing. The Choice rib primal was only at a small \$2.67 premium to Select ribs. The load count of Select grade beef cuts trading in the negotiated market was comparatively small that day. Retailers, looking to get needs covered, paid up for the limited supply.

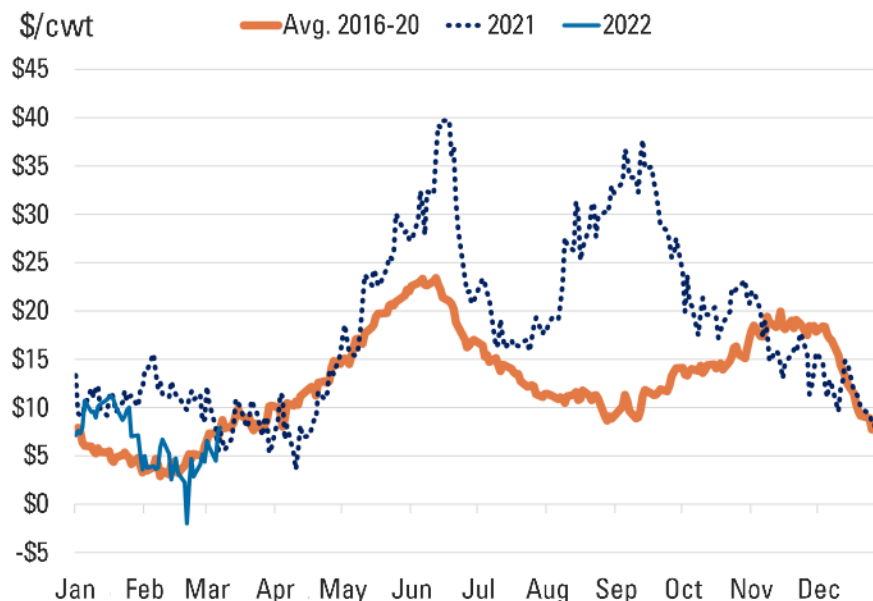
Cutout represents carcass value

The boxed beef cutout represents the estimated gross value of a beef carcass based on prices paid for individual parts of the carcass. The seven primals are: the rib, chuck, round, loin, brisket, short plate, and flank. The primals are made up of various sub-primals. USDA's

Agricultural Marketing Service calculates two closely monitored daily beef cutout values—Choice and Select. They are published in the National Daily Boxed Beef Cutout, [LM XB402](https://mymarketnews.ams.usda.gov/viewReport/2452), mymarketnews.ams.usda.gov/viewReport/2452, and Boxed Beef Cuts – Negotiated Sales – Afternoon report, [LM XB403](https://mymarketnews.ams.usda.gov/viewReport/2453), mymarketnews.ams.usda.gov/viewReport/2453. They also publish a morning report.

A steak labeled USDA Choice means the beef came from a steer or heifer stamped Choice by an official USDA meat grader. Choice and Select are two of the four quality grades used by USDA. The degree of marbling (the white flecks of fat within the lean meat, often referred to as intramuscular fat) is the primary

Figure 1. Choice minus Select beef values. Boxed beef cutout, 600-900 lbs, negotiated, daily. Source: USDA-AMS Market News.



determination of quality grade. Maturity of the carcass is the other factor. Marbling is what gives beef its flavor, juiciness, and tenderness. Carcasses that grade Select have less marbling than their Choice counterparts. Prime quality grade beef has abundant marbling, and is generally sold in restaurants.

The Choice-Select spread is important because roughly 85% of all graded beef is in one of these two quality grades. Anything that shifts the supply or demand for either Choice or Select beef can impact the Choice-Select spread.

Understanding Choice-Select seasonality

When cold weather is prevalent, consumers focus on roasting cuts and enjoying meals indoors. Winter weather generally keeps grills in hibernation. The chuck and round primal experience seasonal strength during the fall and winter. The brisket experiences its highest prices in the winter months. Often only small differences exist between Choice and Select values for the chuck and round. Regardless, if cuts from these two primals are Choice or Select, low temperature cooking can achieve similar results. Cuts from the plate, or short plate, are used to make fajitas, pastrami, skirt steak, and short ribs and do not show any value differences between Choice and Select quality grades.

Differences in values of loins and ribs drive differences in the Choice-Select spread. The loin contributes 21.26% and the

rib contributes 11.40% to the carcass yield. These are the most expensive primals. Cuts from these primals are naturally more tender, regardless of the degree of marbling, but Select grades may need to be monitored a little closer and cooked a little less to keep as tender as possible.

The Choice-Select spread is typically narrowest in the first quarter of the year. This can be summarized as Choice and Select graded beef being closer substitutes during the winter than during the rest of the year.

Volatility reflects imbalances

Since the first of the year, the Choice boxed beef market has produced seven week-to-week price changes exceeding \$5 per cwt. The two that were positive were over \$10. Five were negative and started in February as boxed beef values were searching for their seasonal low. These price swings greatly influence the retail price of beef and consumer purchasing habits.

High fuel prices, rising food costs, falling stock values, and higher interest rates have consumers suffering through tough times. Restaurant business is always vulnerable during tight budgets. Some consumers may be opting to trade down to less-expensive dining options. Beef has great versatility. There are plenty of options for every taste and budget, and some substitution amongst cuts may also be occurring.

Tighter Choice supply will widen spread

Choice grade beef is entering a period of seasonal strength while Select may find it difficult to keep pace. The result, a widening of the Choice-Select spread over the next couple of months. This might be more supply driven than demand driven.

Seasonality of cattle production impacts the Choice-Select spread. The share of cattle grading Choice typically declines during late spring and early summer. A tightening supply of Choice grading cattle in the spring and summer reflects younger cattle being placed into feedlots in the fall. Placements of lightweight cattle are typically high in the fall with seasonally large numbers of spring-born calves available. Lightweight placements require more days on feed as a certain amount of weight gain is necessary to reach Choice quality grade.

In November 2021, placements of cattle weighing less than 700 pounds were up 7.1% compared to November 2020 while placements of cattle over 800 pounds were down 1.3% according to USDA National Agricultural Statistics Service estimates for feedlots with more than 1,000 head capacity (Figure 2). In December 2021, placements of feeders under 700 pounds were up 9.5% year-over-year, while placements over 800 pounds were up only 1.1%. Several factors accentuated the seasonal rise in lightweight placements. Drought in the

western half of the United States limited winter background opportunities. Lower forage availability and high feed prices pushed heifers into feedlots rather than to expand beef cow herds.

Sub markets offer options

Quality grades fall on a continuum. That is, sub-markets can exist for different ranges of a quality grade. An upper two-thirds and lower one-third Choice market allows retailers to offer Choice beef in their meat case that would have previously graded Select plus. Through the first nine weeks of 2022, nearly 75% of fed cattle graded Choice according to the USDA National Steer & Heifer Estimated Grading report, [NW LS196](#), mymarketnews.ams.usda.gov/viewReport/2816 (Figure 3). Just under 31% were in the upper two-thirds Choice category. This is down from levels at the beginning of recent years.

The upper two-thirds Choice threshold is more expensive to produce, relative to lower one-third Choice, which is reflected in the supply curve for each sub-market. High feed costs may encourage cattle feeders to not target as much towards upper two-thirds Choice. That's the marginal cost side. The marginal benefit is the lack of a discount, or premium value Choice provides, when compared to Select. The Choice-Select spread and upper two-thirds Choice premiums are key pricing differentials.

Figure 2. Cattle placed weighing less than 700 pounds, 1,000+ capacity feedlots, US, Monthly. Source: USDA-NASS.

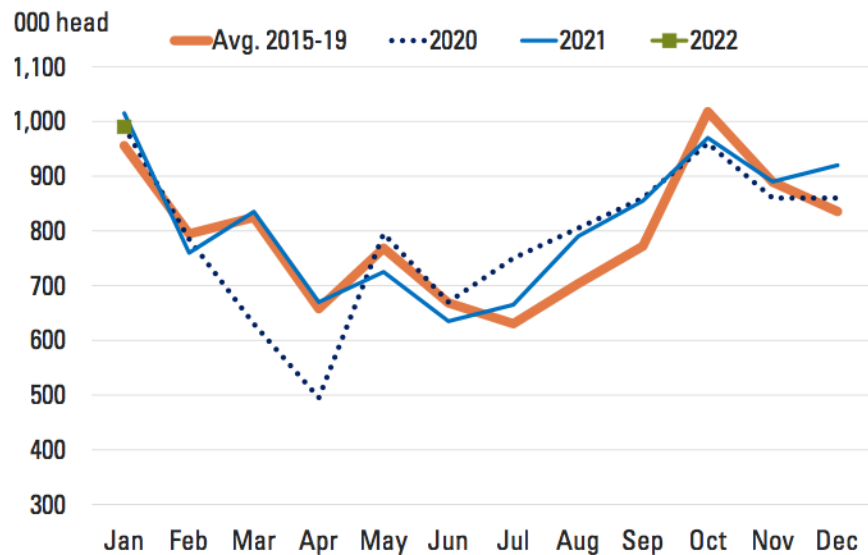
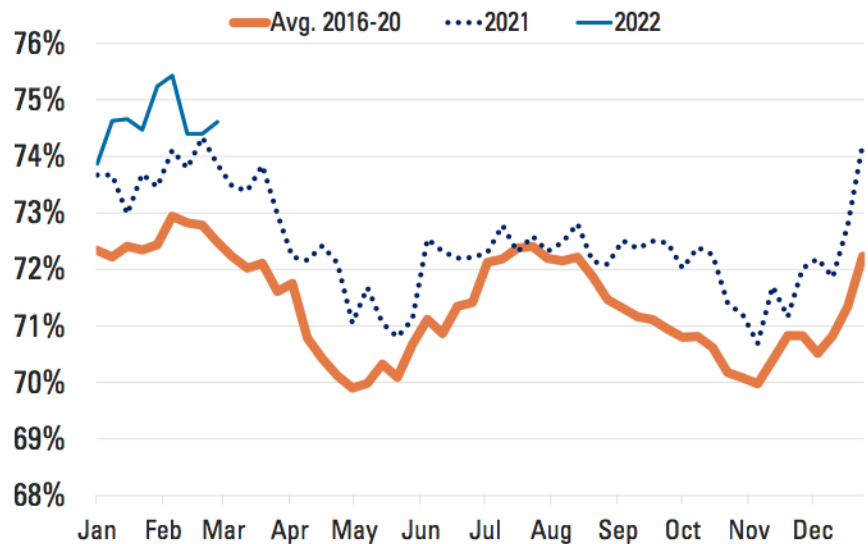


Figure 3. Percent of steers & heifers grading choice, national, weekly. Source: USDA-AMS.





The importance of water vapor

By Don Hofstrand, retired extension value-added agriculture 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.

Water vapor is the most prevalent greenhouse gas. It causes roughly half of the warming of the planet. Like other greenhouse gases, it lets almost all of the sunlight reach the earth's surface but absorbs heat radiated upward from the earth.

Most of us have experienced water vapor as a greenhouse gas. During periods of high humidity, the air cools slowly when the sun goes down because high levels of water vapor trapped heat are in the atmosphere. Conversely, temperatures in dry climates drop rapidly at night due to low levels of heat-trapping water vapor in the atmosphere. You will experience the same feeling when you move out of the sunshine into the shadows. You will feel little change in temperature if humidity is high but more change in temperature if humidity is low.

Although water vapor is a greenhouse gas, it is different than carbon dioxide. The concentration of water vapor in the atmosphere varies greatly by rapidly moving in and out of the atmosphere. By comparison, carbon dioxide is relatively uniformly distributed in the atmosphere and remains in the atmosphere for a hundred years or more.

Moreover, due to its short life in the atmosphere, water vapor concentration varies greatly among geographic regions of the earth. Conversely, due to the long life of carbon dioxide, the mixing caused by global winds results in carbon dioxide's concentration to be evenly distributed among regions of the Earth. This blending means that carbon dioxide emissions from a facility will eventually be distributed across all of Earth's atmosphere.

The air's water vapor holding capacity is highly sensitive to temperature. It ranges from

a maximum holding capacity of only 0.01% in extremely cold temperatures up to 3% in saturated air at about 90 degrees. So, as the earth warms, the atmosphere can hold more water vapor. More specifically, the atmosphere can hold about 4% more water vapor for every one degree Fahrenheit increase in temperature.

Water vapor has an important role in the warming of the earth because the atmosphere's water vapor holding capacity increases as air temperature rises. When carbon dioxide warms the atmosphere, the atmosphere can hold more water vapor, and the additional water vapor, because of its greenhouse effect, warms the atmosphere even more. Water vapor significantly magnifies the warming caused by carbon dioxide.

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.

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

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