Crop price movements over the past few months have been volatile and often in opposite directions. Drought and other global weather issues have pushed prices higher, but projected supplies remain high and usage has eased off slightly to relieve a lot of that price pressure. So the markets have bounced up and down, through several waves of information. With each bounce, the price range has become a bit tighter. In May, the futures-based season average price for corn for 2021 sourced as high as $6 per bushel and dropped as low as $4.80. In June, the range shrank to a dollar ($4.80 to $5.80). In July, the range was 60 cents ($4.90 to $5.50), with the majority of the month between $5.10 and $5.30 per bushel. Soybean prices have followed a similar pattern. The highs have been pressed out as production estimates remain robust. The lows have moved up some as usage continues to hold through the higher prices of this summer.

While this pattern has provided more stable pricing over the past month, that stability could dissipate quickly. As we move toward harvest, there are a few critical factors to watch for signs of significant price shifts. On the supply side, the crop condition ratings can be a leading indicator. For the demand side, advance export sales often signal changes. Let’s look at where these indicators stand currently.

USDA’s weekly Crop Progress reports provide the crop condition ratings. These weekly grades for the crops mostly based on a “windshield” inspection of the crops (how do the crops look as you travel around the countryside), but they do have a strong correlation with the final crop yields ultimately reported by USDA. Typically, ratings above (below) the 5-year average are linked with yields above (below) trend. Figures 1 and 2 show the corn and soybean crop condition...
ratings for 2020 and 2021, along with the 5-year average and the range of ratings since 1986. For corn, this year’s ratings started off strong with the early planting push, but the drought quickly knocked those ratings down below the 5-year average. Starting in mid-June, the national corn crop had a “Good to Excellent” rating for roughly two-thirds of the crop. And that rating has slowly descended to 62% by the end of July, keeping it steadily but slightly below the 5-year average. Looking forward, the 5-year average rating tends to drop a couple more points as we approach harvest, so we might see the same for the ratings in 2021. However, traders will be watching to see if we get a similar rating shift to 2020. Last year, the drought did not fully show up in the ratings until late August and early September (weeks 33-35), when the 2020 crop went from being rated slightly above average to slightly below. The shift in ratings eventually paralleled a shift in the national corn yield, from the July estimate of 178.5 bushels per acre to the final estimate of 172 bushels per acre.

The storyline for soybeans is similar to corn. The first rating was high, based on early planting. But subsequent ratings were lower as the drought was factored in. Relative to the 5-year average, the 2021 crop has been holding steadily but slightly below average. And just like with corn, the concern is we could see another slide, like in 2020. During August and September, the 5-year average rating drops only a point or two. In 2020, the decline was 10 points. Last year, that decline brought the soybean crop rating back down to the average. If we get the same size decline this year, the rating moves from slightly below average to substantially below.

Based on historical relationships, each point swing of “Good to Excellent” rating translates to roughly a 0.2 bushels per acre change on the national soybean yield. So while the ratings have been fairly steady thus far, there could be additional market fireworks ahead.
Another weekly report from USDA gives us frequent updates on the demand picture. The Foreign Ag Service (FAS) in USDA publishes a weekly export sales report. It details the sales and shipments of ag products over the course of the marketing year. Within the report, FAS also tracks advance purchases by international buyers for the upcoming crops. And just like with the crop ratings, we will be watching for movements similar to last year. Figures 3 and 4 display the advance export sales for soybeans and corn. Soybeans started off the 2021 calendar with some large early purchases. By the time farmers were filling out their prospective planting surveys in March, international buyers, mainly China, has stepped up and purchased over 200 million bushels of soybeans. However, that early surge did not last and sales fell back to a more usual pace throughout the spring and early summer. It was during the latter half of last summer when soybean export sales took off and reached over a billion bushels before harvest. Currently, we are not seeing that same intensity this year. While USDA’s projections show a pullback in international demand for the 2021 crop, the outlook still points to a strong export year, 4th largest ever. But the sales will need to start moving soon.

As soybean sales have slid below last year’s pace, corn sales continue to exceed last year. In 2020, the international surge began in July, with sales exceeding 700 million bushels by harvest. This year, the surge came in early May. Over a three week period, roughly 500 million bushels of corn were locked up for export, well ahead of normal sales patterns. Chinese purchases represent the vast majority of the sales, with Mexico and Japan picking up much smaller amounts. Since that surge, corn export sales have returned to a normal pacing throughout the summer. As with soybeans, 2021 corn exports are expected to be lighter than 2020 exports. However, 2021 is also still expected to be the 2nd best export year ever.
For the past month, the crop ratings and the advance export sales have both followed their average patterns over time. The lack of movement in them has allowed price swings to dampen and price levels to settle towards the lower end of the range. Over the past three weeks, corn futures have pointed to a 2021/22 season-average price in the low $5 range, with soybeans coming in around $13 per bushel. Continued stability in the crop ratings and advance sales will translate into a continued drifting of prices lower. However, if we see shifts similar to last year in either ratings or sales, it would reintroduce some upside potential for both markets.

August is not a time when farmers are active selling crops. Those that typically pre-harvest market have already made the sales and those that don’t pre-harvest are waiting for the crops to come in. This year’s markets have been encouraging for farmers of all types as prices have grown and held well above the levels over the past several years. As Figure 5 shows, last year at this time, corn futures were signaling an average price around $3.60 per bushel. Soybean futures pointed to an average price below $9 per bushel. So even while we’re at the lower end of the recent trading range, the price outlook is still historically very strong.
This article is the sixth in a series focused on the causes and consequences of a warming planet

Carbon dioxide has been a driver of the world’s climate for millions of years. It is a greenhouse gas that absorbs heat radiated upward from the Earth and holds the heat in the lower atmosphere. So, carbon dioxide in the atmosphere helps to warm the Earth to a comfortable temperature.

A problem arises when too much carbon dioxide is in the atmosphere. The Earth gets warmer than we want. We cannot blame this on Mother Nature. Left to nature there would be just the right amount of carbon dioxide in the atmosphere. Through our activities, the amount of carbon dioxide in the atmosphere has expanded, causing the Earth’s temperature to rise which in turn causes the climate to change. For example, each us contributes about 16 tons of carbon dioxide to the atmosphere each year.

Carbon dioxide is the most prevalent long-lived greenhouse gas. Carbon dioxide emissions come from decomposed plants and animals stored deep in the earth. The carbon is brought to the Earth’s surface where it is emitted into the atmosphere through the process of burning. The carbon can be in a solid form (coal), liquid form (crude oil), or gaseous form (natural gas).

While the pre-industrial atmospheric carbon dioxide concentration was about 280 parts per million (ppm), current measurements show the concentration is 416 ppm. The previous high in carbon dioxide during the last 800,000 years was 300 ppm. With strong economic growth and no limits on carbon dioxide emissions, scientists predict atmospheric concentration could reach 600 ppm by 2050. In addition, once carbon dioxide is emitted, it can stay in the atmosphere for centuries.

Carbon dioxide has an important natural cycle that does not add to the atmospheric concentration and is critical for plant life on earth. Crops, trees and other plants use the process of photosynthesis to grow and flourish. Photosynthesis takes carbon dioxide from the air and uses it to build the plant. When the plants die and decompose, the carbon dioxide is released back into the atmosphere.

So, the flowers in your back yard take carbon dioxide out of the air in the spring and summer when they grow and release it back into the atmosphere when they die in the fall. But this annual fluctuation should not be confused with the long-term upward trend in atmospheric carbon dioxide over many years.

See the Ag Decision Maker website for more from this series, www.extension.iastate.edu/agdm/energy.html#climate.
Updates, continued from page 1

**Internet Updates**
The following [Information Files and Decision Tools](http://www.extension.iastate.edu/agdm) have been updated on [www.extension.iastate.edu/agdm](http://www.extension.iastate.edu/agdm):

- Economic Analysis of Foliar Fungicide Treatment on Corn – A1-81 (3 pages)
- Economic Analysis of Foliar Fungicide Treatment on Corn – A1-81 (Decision Tool)
- Risk Management Options for Dairy Producers – B1-53 (5 pages)
- Farm Employee Management: Employment Eligibility Verification - The Basics of Form I-9 Compliance – C1-77 (2 pages)

**Current Profitability**
The following [profitability tools](http://www.extension.iastate.edu/agdm/info/outlook.html) have been updated on [www.extension.iastate.edu/agdm/info/outlook.html](http://www.extension.iastate.edu/agdm/info/outlook.html):

- Corn Profitability – A1-85
- Soybean Profitability – A1-86
- Iowa Cash Corn and Soybean Prices – A2-11
- Season Average Price Calculator – A2-15
- Ethanol Profitability – D1-10
- Biodiesel Profitability – D1-15

---

This institution is an equal opportunity provider. For the full non-discrimination statement or accommodation inquiries, go to [www.extension.iastate.edu/diversity/ext](http://www.extension.iastate.edu/diversity/ext).

**Permission to copy**
Permission is given to reprint ISU Extension and Outreach materials contained in this publication via copy machine or other copy technology, so long as the source (Ag Decision Maker Iowa State University Extension and Outreach) is clearly identifiable and the appropriate author is properly credited.