

Agriculture By the Numbers

July 2021

NDSU Extension Agribusiness and Applied Economics

Farm Program and Crop
Insurance Payments
Critical in 2020

Adjusting Marketing Plans
for Drought Conditions

Forced Livestock Sales

Black Swans Cause Cattle
Price Volatility

Farm Program and Crop Insurance Payments Critical in 2020

By Bryon Parman, NDSU Extension Agricultural Finance Specialist

Crop insurance and farm program assistance have been an important backstop for farmers in the U.S. and North Dakota for a very long time. Since the very first farm bill, which came about in the Depression era, farm programs have helped provide a safety net such that a bad year did not force as many farmers to exit the industry.

The farm bill is updated every few years to accommodate industry changes and new risks, but once implemented, requires no further action by the federal government because its actions are automatic once certain conditions are met. Crop insurance has been around a long time, and given the unpredictability of weather and the high production costs of modern farming, it is a necessary tool farmers must use to manage risk.

During the last three years, however, the federal government has implemented additional ad hoc farm programs such as Market Facilitation (MFP) 1 and 2 and Corona Virus Food Protection (CFAP) to combat falling commodity prices due to trade disputes and the recent pandemic. These programs are different than the more traditional farm bill in that they are one-off payments and more tailored to the crop being grown rather than any weather-related issue or specific market trigger impacting the specific farmer.

However, these one-off programs have been instrumental in keeping net farm incomes in North Dakota above zero along with crop insurance. Figure 1 shows the state average net farm income in North Dakota from 1996 through 2020. Indeed, 2020 was actually one of the strongest years that North Dakota farmers have had since 2012, which was one of the best years of all time in the state.

Editor: Bryon Parman
Assistant Professor/Agricultural
Finance Specialist

701-231-8248
bryon.parman@ndsu.edu

NDSU

EXTENSION

Farm Program and Crop Insurance Payments Critical in 2020 – continued from page 1

Figure 1: North Dakota State Average Net Farm Income.

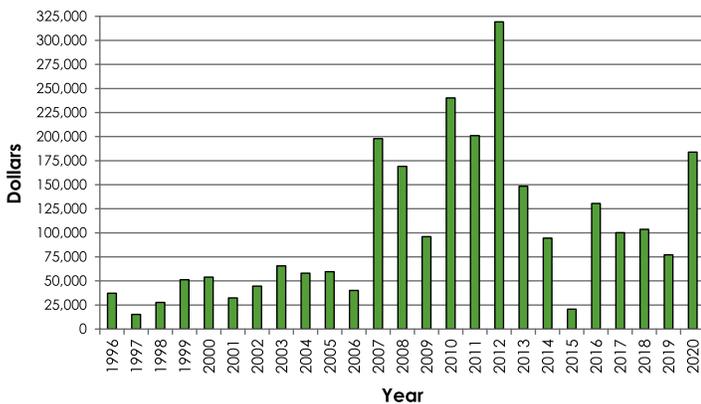
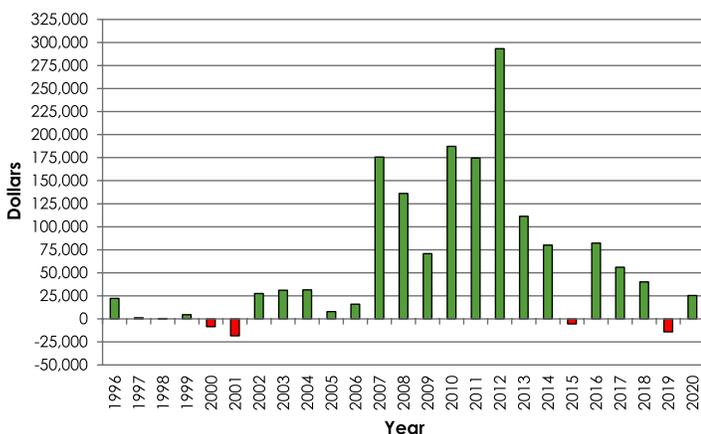


Figure 1 shows that in no year since 1996 have we had an average net farm income below zero. However, Figure 2 shows net farm incomes excluding government payments. This chart shows not only that net farm incomes in some years such as 2019 and 2001 would have been negative, but net farm income in 2020 falls from more than \$175,000 per farm to about \$25,000 per farm on average.

Figure 3 shows the importance of crop insurance. In Figure 1, 2020 was the fifth best year since 1996 for net farm income. However, in Figure 3, when government program payments and crop insurance indemnities are removed, 2020 becomes the worst year since 1996, with the average farm losing almost \$80,000.

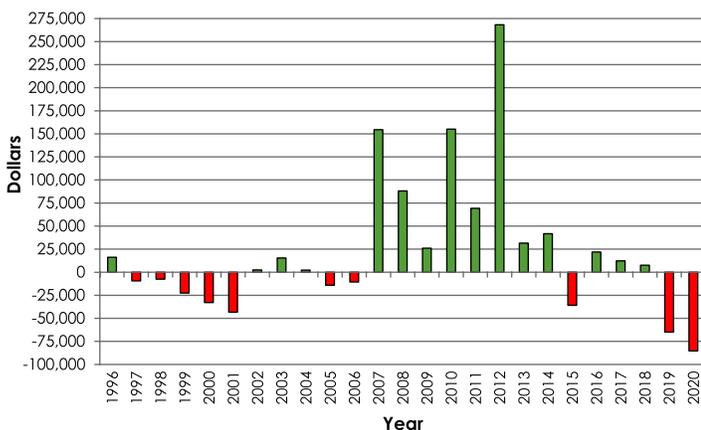
Figure 2: North Dakota Net Farm Incomes Without Government Payments.



Part of the reason for the wide swings in average net farm income when government program payments are removed during the last three years was because of how many farmers were impacted. Often only a fraction of the state's farms will receive some form of farm program payment in a given year.

In the more traditional farm bill environment, programs are triggered by conditions of weather or prices and likely will impact only a few crops in that year, while MFP and CFAP paid out on every crop listed and in larger amounts. For instance, 2015-2017 had lower net farm income without government payments, but not nearly the same difference as in 2018-2020.

Figure 3: North Dakota Net Farm Income Without Government Payments or Insurance Payments.



Additionally, North Dakota had widespread weather issues in 2019 and 2020 due to wet planting conditions. A larger than usual percentage of the state in 2019 took advantage of the prevented planting program due to wet conditions and not being able to get into the field. Others planted late and experienced a wet fall, causing further issues that persisted into 2020. This resulted in a large share of the state needing to collect crop insurance.

While an ad hoc farm payment may not be created in 2021, some of the CFAP money was not paid until after the end of 2020 and will show up as government payments this year. Couple that with the widespread drought impacting North Dakota and 2021 may be another year where crop insurance and farm programs help keep North Dakota farmers above water despite the higher commodity prices that have persisted during the year.

Adjusting Marketing Plans for Drought Conditions

By Frayne Olson, NDSU Extension Crop Economist/Marketing Specialist

Drought conditions in the northern Plains and western Corn Belt are impacting crop prices and forcing farm managers to re-evaluate their marketing plans. Growing uncertainty about corn, soybean and spring wheat production has increased average crop prices and amplified price volatility. Cash and futures market traders are watching weather forecasts very carefully.

Farm managers also are having more difficulty deciding how much, if any, additional production to price or sell before harvest because of production uncertainty. Higher prices are intended to stimulate more sales, but financial risks are involved in selling more bushels than can be produced.

Figure 1 shows the U.S. Drought Monitor on March 16, 2021, while Figure 2 shows the U.S. Drought Monitor for June 22, 2021. Please note the increase in drought severity in North Dakota, South Dakota, Minnesota and Iowa. While the Drought Monitor may not provide an accurate forecast of final crop yields, it is watched very closely by market traders and it impacts their expectations about future yield potential.

The challenge for farm managers living in drought areas is to estimate how many bushels, pounds or tons can be produced on their farm, and how much of their expected production do they dare sell before harvest. During years with significant drought, marketing year prices often set highs late in the growing season when yield uncertainty is the greatest. For spring wheat, this is often in July, while for corn and soybeans, it is often in August or early September.

Continued on page 4.

Figure 1. U.S. Drought Monitor for March 16, 2021

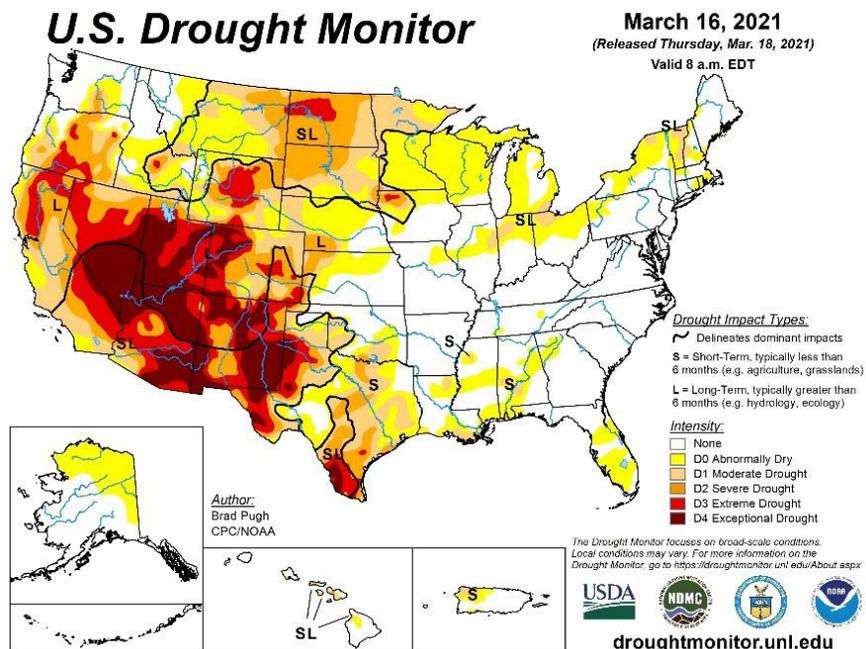
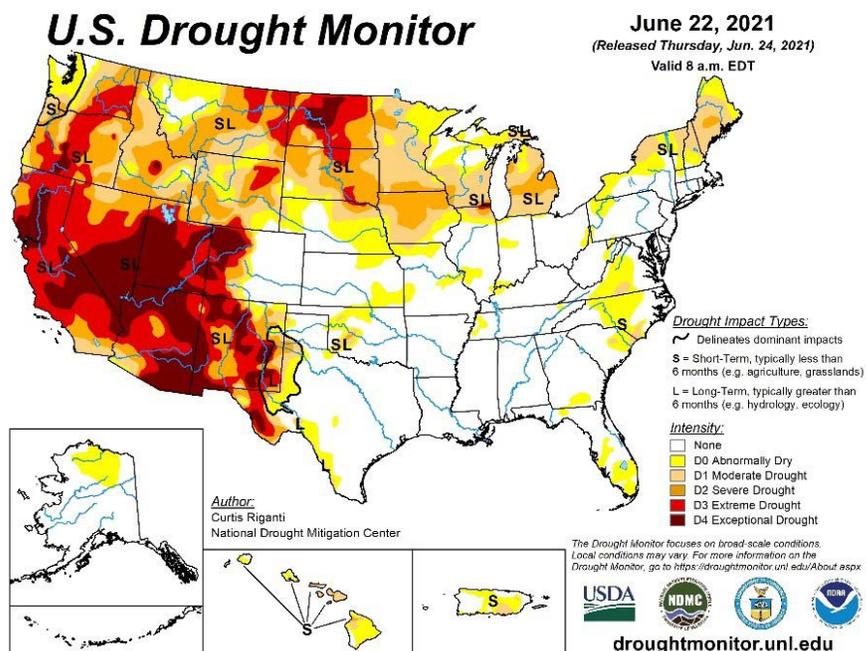


Figure 2. U.S. Drought Monitor for June 22, 2021



Adjusting Marketing Plans for Drought Conditions

— continued from page 3

Most basic crop marketing plans break the marketing year into three, or sometimes four, time periods; preplant, growing season and postharvest. The farm manager then sets price, timing and sales volume targets for each of these blocks of time.

The sales volumes in each block are adjusted based upon yield expectations. For example, in the preplant time period, average or trend-line yields often are used. During the growing season, yield expectations are adjusted higher or lower based upon growing conditions. The postharvest sales use actual production, less the amounts that already have been sold.

Estimating yield potential during droughts is very difficult and many farm managers are uncomfortable making additional sales before harvest because they are concerned they will not have enough bushels to fill a delivery contract. However, as noted above, the marketing year price highs often occur during the growing season.

Unfortunately, producers have no simple solution to this management problem. Each farm operation and farm manager is unique, with different risk tolerances, cash flow needs and cost structures.

Even though each farm is different, some marketing strategies provide increased flexibility and could deliver a more favorable risk-return tradeoff. Using futures or options-based strategies rather than contracts that require physical delivery provides more flexibility. Futures and options markets have high trading volumes and are very liquid, meaning that entering and exiting trading positions is easy to do.

Cash market contracts with an elevator or processor can provide pricing and payment flexibility but require physical delivery of the contract grain. If a production shortfall occurs, the farm manager must deliver grain from existing inventories or renegotiate the terms of the original contract. This renegotiation may require the purchase of grain from the spot market to fill the deficit or shift delivery into the next crop year.

In contrast, the farm manager could sell futures contracts to “lock in” the futures price on a portion of the expected production. The futures contracts are repurchased when the cash grain is sold. If the farm manager believes a shortfall in production may occur before harvest, and the manager has oversold the farm’s production, the excess futures contracts can be repurchased at any time. Because physical

delivery is not required, the farm manager has no need to renegotiate a contract.

Just because some of the futures contracts were offset early does not mean that a loss will occur on the trade. If futures prices decrease after the contracts are purchased, the farm manager will see a gain when the contracts are resold (sell high, buy low). However, if futures prices increase, a loss will occur.

Another strategy would be to purchase put options to partially compensate for a decrease in futures prices. Put option premiums increase, or gain value, when futures market prices decrease. Once again, if a shortfall in production is expected, a portion of the put options can be resold at any time. Option contracts do not need to be held until expiration. Even though the options markets are not as liquid as futures markets, buying and selling options when needed still is relatively easy.

Just like futures contracts, a gain or loss may occur on the trading of options, depending upon the price movements. If futures market prices decrease, the value of a put option will increase. If the futures market prices increase, the value of a put option decreases.

Options strategies are lower risk than futures strategies, but they also offer lower profit potential. The increase or decrease in an option premium value never will be equal to the increase or decrease in the futures market prices unless the option is very near expiration. This means that if the farm manager is using options to hedge expected production, a decrease in cash prices will not be fully offset by the increase in put option values.

If farm managers want to trade futures or options contracts, they must work with a licensed broker and open a trading account. Establishing a trading account is not difficult but does require planning. The farm manager also will need to deposit funds into a margin account and set up an electronic funds transfer system to cover potential trading losses.

Finally, what is important to remember is that federal crop insurance provides an important financial safety net during drought conditions. However, crop insurance compensates a farm manager for the bushels that are not produced. In contrast, a marketing plan establishes a price for the bushels that **are** produced. Developing a marketing plan for the expected production is still important.

Forced Livestock Sales

By Ron Haugen, NDSU Extension Farm Management Specialist

When selling more livestock than normal due to weather-related conditions, producers have two IRS provisions to consider: IRC 1033(e) and IRC 451(g).

Involuntary Conversion of Draft or Breeding Animal, IRC Sec 1033(e)

A livestock producer who sells more **draft, breeding or dairy** animals than normal due to weather-related conditions may defer recognition of the gains for up to two years.

The animals must be replaced within two years with other animals used for identical purposes. This applies only to the number of animals sold in excess of normal business practices.

A declaration of a disaster area is not necessary, but the producer must be able to show that weather-related conditions forced the sale of more livestock than normally would be sold. If a federal disaster declaration is made, the replacement period is four years. The U.S. secretary of the Treasury can extend the period further if the drought persists three years or more.

The tax basis of the replacement livestock is equal to the basis in the livestock sold plus any additional amount invested in the replacement livestock that exceeds the proceeds from the sale.

If the animals are not replaced, or if the replacement cost is less than the gain from their sale, the difference must be reported as a gain for the sale year by amending the producer's tax return. The return will be subject to additional tax and interest.

It is a dollar-for-dollar replacement not head for head.

Making the Election 1033(e)

The producer makes this election by attaching a statement to the individual's tax return. The election must include the following information:

- Name, address and ID number
- A declaration that the election is made under I.R.C. § 1033(e)
- Evidence of the weather-related conditions that forced the sale or exchange of animals
- Explanation of how the sale is related to weather conditions
- Number and kind of livestock sold or exchanged
- Number of livestock of each kind that would have been sold or exchanged under normal business circumstances (generally, the average number of animals sold during the three preceding years)
- The amount of gain realized on the sale or exchange
- The amount of income to be postponed

Example 1: Election under I.R.C. §1033(e) to postpone recognition of gain from livestock sold because of weather-related conditions

John Taxpayer (000-00-0000)
123 County Road 1
Anywhere, USA 12345

The weather-related conditions evidenced by the attached rainfall reports, Drought Monitor chart and news clippings affected availability of forage and feed, and caused taxpayer to sell 40 head of beef cows instead of 25 head in 2021. The raised cows have zero tax basis.

The number of animals sold in each of the three preceding years was:

2018 - 28 head

2019 - 23 head

2020 - 24 head

Total 75 head. The three-year average is 25 head.

The 40 beef cows were sold for \$50,000 in 2021. Taxpayer elects to postpone the \$18,750 gain on the 15 extra head sold.

Computation of income to be postponed:

40 head sold in 2021 for \$50,000 total gain realized

25 three-year average sale (reported in 2021) \$31,250 gain ($\$50,000 \div 40 \times 25$)

15 head sold due to weather-related conditions and electing to postpone the gain. \$18,750 deferred gain ($\$50,000 \div 40 \times 15$)

Continued on page 6.



Forced Livestock Sales — continued from page 5

Deferral of Income for One Year of Sale of Market Animals, IRC Sec 451(g)

Livestock producers using the cash method of accounting can elect to defer for one tax year the income of **any** qualified livestock sold due to weather-related conditions. The area must be federally recognized and declared as eligible to receive federal assistance.

The animals do not need to be raised or sold in the declared disaster area, just that a weather-related event caused the area to receive a federal disaster designation and caused the sale of the animals.

Only livestock sales in excess of normal business practice qualify for deferral. The animals are not replaced and the elected gain is simply put off to the next year.

Making the Election 451(g)

The producer makes this election by attaching a statement to the individual's tax return. The election must include the following information:

- Name, address and ID number
- A declaration that the election is made under I.R.C. § 451(g)
- Evidence of weather-related conditions that forced the sale or exchange of animals and federal disaster designation
- Explanation of how the sale is related to weather conditions
- Number of livestock of each kind that would have been sold or exchanged under normal business circumstances (generally the average number of animals sold during the three preceding years)
- Total number of animals sold in the current year and the number sold due to the weather-related circumstance
- The amount of income to be deferred

Example 2: Election under I.R.C. §451(g) to defer gain due to weather-related conditions

Election is made under IRC Section 451(g) by the due date of the return (including extensions) for the tax year in which the area was designated a federal disaster area.

John Taxpayer (000-00-0000)
123 County Road 1
Anywhere, USA 12345

Because of weather-related conditions (evidence attached), 130 head of calves were sold in 2021 instead of the usual 75.

Received \$123,500 for the 130 head. 55 head sold above normal sales, \$52,250 of income deferred.

One strategy for cow-calf pairs is using section 1033e for the cows (breeding stock) and using section 451g for the calves. An excellent guide on this topic is IRS Publication 225, "Farmers Tax Guide." Contacting your tax professional for help always is a good idea.

Reference: J.C. Hobbs, Oklahoma State University

Black Swans Cause Cattle Price Volatility

Tim Petry, NDSU Extension Livestock Marketing Economist

Cattle prices have been very volatile in the last several years. Most livestock marketing textbooks identify four important livestock price patterns: long term, cyclical, seasonal and irregular.

Most of my columns focus on seasonal and cyclical price patterns because they are important for developing marketing plans. But when irregular patterns occur, they get emphasis because re-evaluating marketing plans may be necessary.

Past examples of irregular price patterns that caused abrupt cattle price declines followed by varying lengths of subsequent rebounds are the Sept. 11, 2001, terrorist attacks and the 2003 discovery of bovine spongiform encephalopathy (BSE) in a U.S. cow.

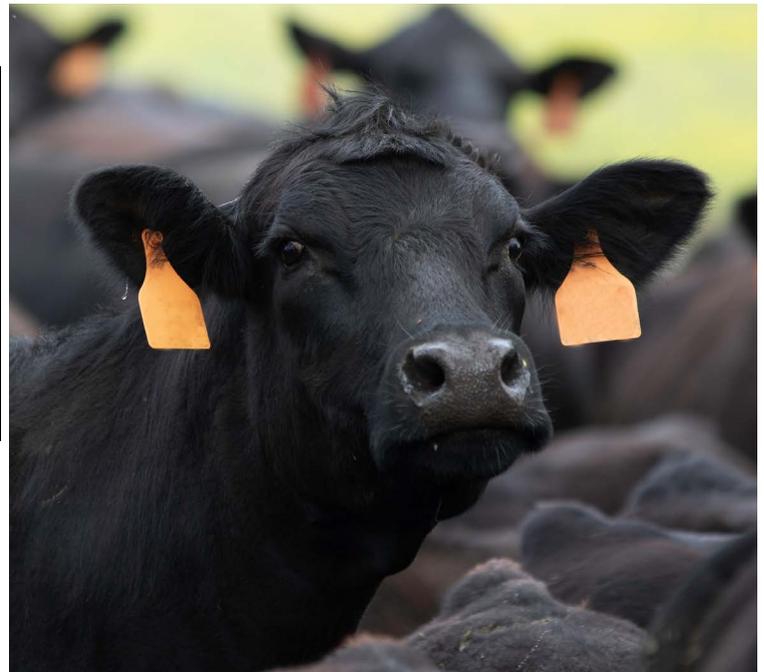
A 2002 quote by Donald Rumsfeld, then U.S. secretary of Defense, when holding a news briefing about the possibility of Iraq having weapons of mass destruction, sums up what has happened to cattle prices.

He stated, “There are known knowns; there are things we know that we know. There are known unknowns; that is to say, there are things we now know we don’t know. But there are also unknown unknowns; there are things we do not know we don’t know.”

Rumsfeld’s “unknown unknowns” could be classified in the irregular cattle price pattern category.

Those events lately also have been called “black swan” events. A black swan event is defined as “an unpredictable event typically with extreme results.”

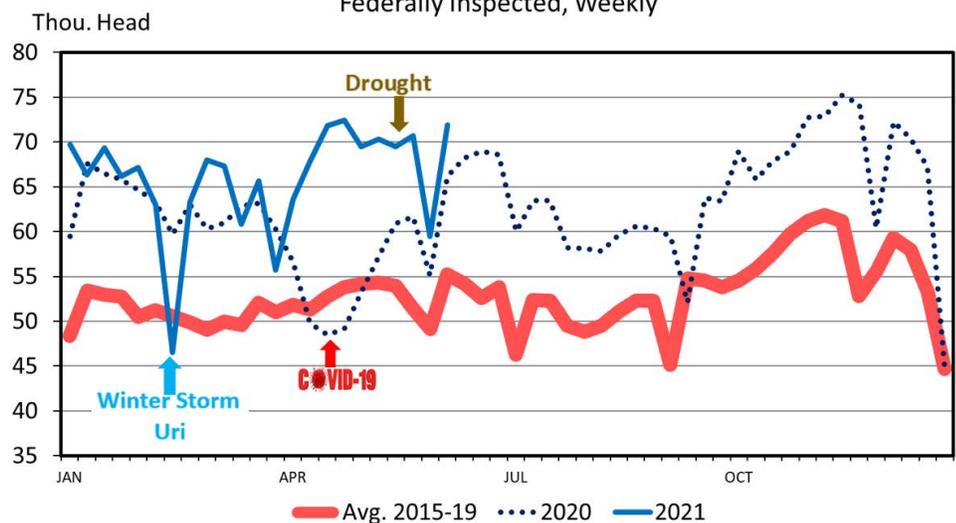
Let’s look at examples of factors that have affected cattle prices in the last couple of years and are affecting prices now.



Jacqueline Nix_istockphoto.com

An example of a known known is the U.S. beef cow herd has declined for two straight years: 2019 and 2020. Drought developed in many Western states in 2020 and expanded into the northern Plains in 2021, with forced beef cow liquidation. Higher beef cow slaughter in the first half of 2021 is expected to continue and will result in the beef cow herd declining again in 2021.

BEEF COW SLAUGHTER
Federally Inspected, Weekly



Declining beef cow numbers will be supportive to cattle prices in the next several years.

An example of a known unknown is the 2020-2021 corn price rally due, at least in part, to strong demand from China. July 2021 corn futures prices

Continued on page 8.

Black Swans Cause Cattle Price Volatility

— continued from page 7

were in excess of \$7/bushel in May. One year ago, the July 2021 contract traded at \$3.25.

I doubt if many expected prices to now be that high back then.

We know that corn prices will continue to be volatile as information on the number of planted acres, crop development and expected yields, along with the dynamic export market, affect prices.

Volatile corn prices will affect calf and feeder cattle prices. Remember the adage “a 10 cent/bushel change in corn prices will cause a \$1/hundredweight change in fall calf prices in the opposite direction.”

The last couple of years have seen a number of “unknown unknown” black swan events that caused seemingly endless cattle price volatility. Markets do not like uncertainty and tend to respond abruptly and sometimes too much.

2020 began with expectations for improving cattle prices as the beef cow herd declined, the U.S. economy was robust with low unemployment, and ratifying trade agreements with our top four beef customers caused record beef exports.

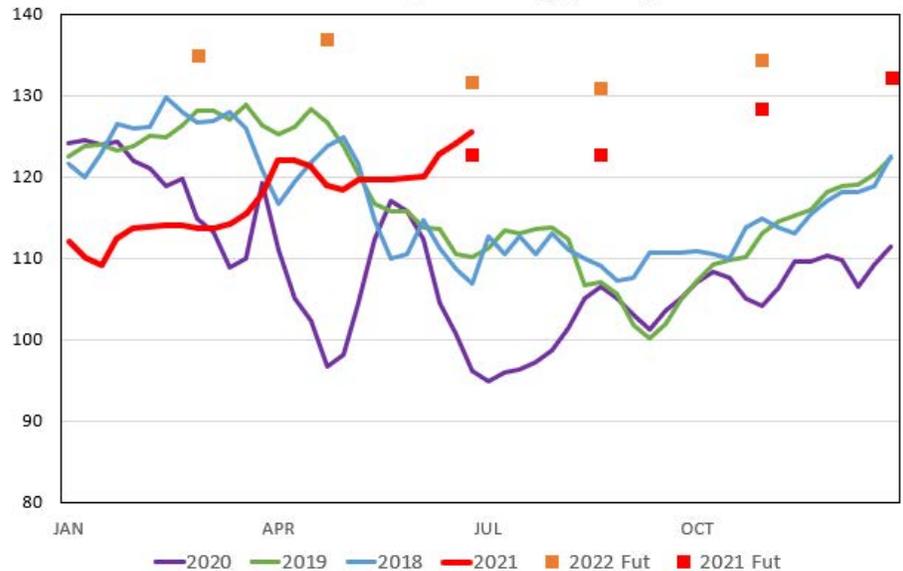
But the most catastrophic black swan event to happen in some time, the COVID-19 pandemic, started in early 2020 and quickly spread throughout the world, including the U.S. The domestic and world beef markets were severely disrupted as stay-at-home and social distancing orders were put in place.

The worst negative cattle price impact occurred in 2020, but lingering effects still are impacting cattle and beef markets.

Other recent black swan events that were less catastrophic but caused uncertainty and at least temporarily negatively impacted cattle prices were the Tyson packing plant fire in August 2019, the southern Plains winter storm Uri in February and the recent foreign cyber attack hacking of JBS, a major world meat packer.

FED STEER PRICES

5 Market Weighted Average, Weekly



Expectations are again for cyclically increasing cattle prices. Lower beef cow numbers will cause lower beef production, COVID-19 vaccinations are resulting in a return to normalcy and beef exports are again at record levels.

Fed cattle prices have continued to improve this year, with late 2021 live cattle futures prices near \$130.

2022 futures prices are all trading above \$130, with the April contract more than \$137. Those would be the highest fed cattle prices since 2017.

We can only hope for the black swans to stay away!



DrPAS_istockphoto.com

NDSU EXTENSION

EXTENDING KNOWLEDGE >> CHANGING LIVES

The NDSU Extension does not endorse commercial products or companies even though reference may be made to tradenames, trademarks or service names. NDSU encourages you to use and share this content, but please do so under the conditions of our Creative Commons license. You may copy, distribute, transmit and adapt this work as long as you give full attribution, don't use the work for commercial purposes and share your resulting work similarly. For more information, visit www.ag.ndsu.edu/agcomm/creative-commons.

County commissions, North Dakota State University and U.S. Department of Agriculture cooperating. NDSU does not discriminate in its programs and activities on the basis of age, color, gender expression/identity, genetic information, marital status, national origin, participation in lawful off-campus activity, physical or mental disability, pregnancy, public assistance status, race, religion, sex, sexual orientation, spousal relationship to current employee, or veteran status, as applicable. Direct inquiries to Vice Provost for Title IX/ADA Coordinator, Old Main 201, NDSU Main Campus, 701-231-7708, ndsu.eoaa@ndsu.edu. This publication will be made available in alternative formats for people with disabilities upon request, 701-231-7881.