Getting Started In Ag:
Dealing With Inflation and Supply Chain Disruptions

The Covid-19 pandemic has caused many disruptions, one of the more serious may be inflation. Virtually everyone involved in production agriculture is dealing with the effects of inflation at present. In addition, indications are that it may be with us for a considerable time. If you are just starting out in agriculture, you may be unaware of the many ways inflation can sap the profitability of your business, how to properly quantify its effects or strategies for dealing with it. Inflation can be most easily defined as too much money chasing too few goods and services, leading to rising prices. Inflation is often viewed as a hidden tax because as prices rise you often have no choice but to pay more.

Supply chain disruptions and inflation are often interconnected. For example, manufacturing disruptions that have come about due to Covid or other issues, have reduced supply and led to increasing prices. This scenario is playing out in many ag-related sectors, from machinery and related parts, to crop inputs, to livestock to pharmaceuticals and other ag-related industries.

It is important to plan ahead with as much detail as possible for this type of risk. The more you budget and outline alternative scenarios to address potential supply and price issues, the better are your chances of identifying both weak links and potential opportunities. Keeping as many options open as possible helps keep your business able to adjust quickly as conditions change.

Input Price Effects

Agriculture is often hit hard in times of significant inflation because it is an input-heavy business. Most crop or livestock operations are dependent on significant inputs e.g., seed, fuel, feed, fertilizer, and machinery parts are just a few of the basic essentials that cannot be omitted. In addition, most farmers and ranchers are not able raise prices in response to input price increases. And, while commodity prices may increase in inflationary times, these increases are frequently not substantial enough to offset price hikes on the input side.

Table 1. Wyoming cattle and input price comparison

	Jan. 2021	Jan. 2022	% change
Feeder cattle (500-600lb) $/cwt	$170.34	$200.60	17.76%
Selected Input Prices (IL report)	2020	2021	% change
Nitrogen Fertilizer (Dry, price/ton)	$366.67	$912.00	148.73%
Diesel Fuel (price per gallon)	$2.03	$2.85	40.39%

Source: www.ams.usda.gov/mnreports/lswwysums.pdf
www.ams.usda.gov/mnreports/gx_gr210.txt

For example, the price of 5-600 pound feeder cattle in Wyoming has increased 17 percent from this time last year, while prices for nitrogen and diesel fuel have increased 149 percent and 40 percent respectively, Table 1. Rising prices are often followed by rising interest rates that presents another set of problems. The Federal Reserve will likely change policy to reduce the money in supply at some point, in turn leading to an increase in the cost of borrowing outside capital.

Clearly inflation can wreak havoc in a farm or ranch budget. The question becomes how to best to plan for it. Proactive managers can adjust the values in their partial or enterprise budgets. However, these price increases must be accounted for on a longer term basis, potentially over several production cycles. Keeping a long term focus should be a central goal; as a result, it is important to account for the time value of money in the budgeting process, as well as variable prices.

Using the MTRA tool

Consider the following example corn budget using the Multi-Temporal Risk Analyzer (MTRA) tool from RightRisk.org to understand the effects of increasing interest rates. MTRA is designed to calculate the effects of a proposed management change over time. Its ability to show the influence of the time value of money over a 20-year period is particularly useful in this case. We can reveal the effects of inflation in specific parts of a crop or livestock budget, such as rising input prices like fertilizer or feed, as well as gauge the direct effects of inflation over a long period (up to 20 years) using MTRA analysis.

For example, we can calculate the long term effect of an increase in nitrogen fertilizer price taken from an example corn budget. Assume nitrogen fertilizer expense in our corn budget increases from $200 per acre to $400 per acre. We enter $200 as the most

Multi-Temporal Risk Analyzer

- Partial Budget, risk simulation analysis that includes over 1,000 possible outcomes in the simulated results
- Users define inflows and outflows with a range of variability entered for each
- Users can select up to 20 years for each inflow and outflow category
- Simulated results include probability analysis on both a cash and net present value basis

Visit **Rightrisk.org** for more information.

likely value under added costs. The tool allows for a range of values for each revenue or cost category (most likely, low, and high) to account for the possible variability.

We enter $400 as the high value if we anticipate a potential expense of $400 per acre and $100 for the low, where we assume that the effects of inflation will be long-term in nature. We select all 20 years for the effect of these changes by clicking ALL and enter 5 percent for the interest rate to account for the time value of money. Further, we estimate corn grain revenue using the Wyoming average price over the past five years as $3.46/bu and yield as 150 bu/ac, giving an average total revenue of $519/ac. We enter this as the most likely, high, and low values in the added returns section and click ALL to select all 20 years to keep this revenue estimate constant, in order to gauge the effects of changing fertilizer expense. Next we click RUN to generate the output analytics.

Output is presented on a cash- and a net present value-basis (NPV-basis). In addition, it can be viewed as a single simulation result or a cumulative probability distribution; the result of 1,000 randomly generated draws from possible outcomes.

The graph showing the cumulative probability distribution on a present value basis is of particular interest, Figure 1. The cash-basis most likely revenue of $519/ac less the fertilizer expense of $200/ac is easily calculated leaving a net revenue of $319/ac per year. The NPV-basis results are much lower due to the effect of the time value of money; the 5 percent interest rate entered to account for inflation.

The most likely net revenue is estimated as $4,025 or $201 per acre per year with a 50/50 probability over the 20-year time frame. In other words, we could expect a net revenue on average of $118 less per acre due to the projected inflationary increase in fertilizer prices, given our assumptions. Further, we see there is a zero percent probability of net revenue falling below $78/ac on a NPV-basis and 100 percent probability that the high will not exceed $274/ac, given the range of fertilizer values. This is just one example of the type of questions MTRA can help answer.

Mitigation Strategies

Numerous strategies may help limit the negative effects of inflation. First, consider locking in critical input prices in advance. Forward pricing brings stability to a budget and can offset other unavoidable price increase, though this means resisting the temptation to hold out for lower prices. Suppliers are often eager to work with you, as this adds an element of stability to their business as well.

Second, evaluate whether inputs are providing an adequate return on investment. For example, $100 per acre phosphorous may make sense at a given commodity price but it may not make sense at $400 per acre. It comes down to knowing what is affordable in your situation. Making sure that every input or expense delivers a positive contribution to the bottom line can help keep overall expenses manageable.

Third, consider diversifying operating input suppliers where possible. This can help reduce expense increases due to supply chain disruptions. Fourth, carefully evaluate your enterprise mix with an eye on risk and uncertainty. For example, a livestock enterprise might provide extra benefits in the form of manure for fertilizer and soil health when added to an all-crop enterprise mix. Adding an alternative hay crop with minimal fertilizer requirements may reduce risk, while offering stable cash flow.

Finally, it is important to stay informed and up to date on input supplies, availability and prices. The more informed you are about changing prices and other factors, the more accurate your forecasts will be. For more information on strategies to deal with inflation and other risk management issues, visit RightRisk.org.

Figure 1. MTRA estimated net revenue per acre of corn, cash- and net present value-basis probability distribution at 5 percent inflation