



Getting Started In Ag: Know Your Fertilizer Costs

Prices for most commodities are currently at unusually high levels. Unfortunately, so are prices for most critical inputs. It is imperative, as discussed in previous articles, to make sure every dollar spent on inputs is effective and provides an acceptable return on investment. Fertilizer is no exception.

Fertilizer is a key input for most crop and livestock operations. Prices for most fertilizers are closely linked to fuel prices, also currently at near record levels (Table 1). These conditions, coupled with foreign supply issues, have driven prices even higher. These factors will be a significant driver of the cost of production for most crops and forages grown in the state in 2022.

Most operators find it difficult to achieve satisfactory levels of crop production without fertilizer. It is imperative to carefully consider fertilizer input cost and corresponding crop yield to evaluate how much you can afford to apply at expected sale prices.

ONLINE FERTILIZER TOOLS FROM RIGHTRISK.ORG

RightRisk Analytics include web-based tools to evaluate fertilizer inputs, including the quantity of fertilizer to apply. The tool is based on the concept of diminishing marginal returns; as fertilizer inputs increase, there is generally a diminishing benefit in the form of declining yields in response. The tool can help evaluate the most economic level of fertilizer to apply for a variety of example crops listed, based on previous yield-research for each crop. Users enter fertilizer cost, crop harvest costs and sale prices. The tool allows producers to adjust yield increments and fertilizer applied from their own data as well.

Select from the list of crops on the left hand of the screen to begin. For example, if we select improved grass hay from the menu, the tool then generates a preloaded example showing nitrogen fertilizer applied in 40-pound increments per acre, the associated yield increases, the fertilizer cost per pound, crop harvest

FOR MORE INFORMATION

You can find the fertilizer cost tools under the Risk Management Tools tab at RightRisk.org. There are numerous risk management tools, courses, and other resources that may be of great benefit if you are new to production agriculture.

cost per pound and the crop sale price. We will assume the yield increments already entered remain the same for this example (Table 2).

Entering fertilizer cost requires some additional calculations. Assume we are applying 160 pounds of 46-0-0 (nitrogen) fertilizer per acre or 73.6 pounds of nitrogen (46 percent of 160 pounds). We enter the fertilizer cost on a per-pound basis for the available nutrient applied. Assume the fertilizer price is \$900/ton and it yields 920 pounds of nitrogen per ton (0.46 times 2,000). We divide \$900 by 920 to arrive at the cost per pound of \$0.98 per pound of nitrogen applied. This, times 73.6 pounds (160 pounds of 46-0-0 applied), results in a cost per acre of \$72.13 per acre. For our example hay crop we assume \$50/ton for harvest cost (cutting, raking, baling and stacking), and an expected sale price of \$200 per ton. It is important to remember to include all harvesting costs to ensure the resulting answer is as accurate as possible.

Click CALCULATE to generate results showing the optimal level of fertilizer at 120 pounds per acre. Here added returns minus added costs equal a positive \$13.30 per acre. Note that even with high prices for the hay crop, the yield benefit from applying fertilizer at 160 pounds per acre is offset by its high cost (added returns less than added costs). The 160 pound

FERTILIZER—HOW MUCH CAN YOU AFFORD TO APPLY? Visit RightRisk.org/Analytics

- Crops covered
- Native Meadow
 - Improved Grass Hay
 - Grass-Alfalfa hay
 - Dryland Grass Pasture
 - Dryland Crested Wheatgrass
 - Garrison Foxtail
 - Corn for grain and silage
 - Malting Barley
 - Wheat (including dryland winter)
 - Sugar beets (both yield and sugar)
 - Dry edible beans

Table 1. Selected fertilizer prices (USDA-AMS IA report)

Product	Price Range/Ton	Avg/Ton
Anhydrous Ammonia	\$1430-1551	\$1,519
Urea (46-0-0)	\$735-953	\$841
Liquid N (28-0-0)	\$640-708	\$669
DAP (18-46-0)	\$835-850	\$943
Potash (0-0-60)	\$770-859	\$805

Source: Feb. 8, IA market report. Mymarketnews.ams.usda.gov/viewreport/2963

Table 2. Fertilizer cost input screen

Improved Grass Hay

Data for an example production system* have been entered into the table as a starting place for calculating information for your situation.

To calculate your own results input or change the information and press the CALCULATE button to find the most economical level of fertilizer:

	First Increment	Second Increment	Third Increment	Fourth Increment	Fifth Increment	Sixth Increment	Seventh Increment
Fertilizer Applied per Acre	0	40	80	120	160	0.0	0.0
Yield per Acre	1.11	1.69	2.15	2.50	2.74	00.0	00.0
Fertilizer Cost	\$ 0.98	per Pound (If you don't know the cost per pound, click here to use the Fertilizer Formulation Analysis software.)					
Crop Harvest Cost	\$ 50.00	per Ton/Acre	▼	Crop Units per Acre			
Crop Sale Price	\$ 200.00	per Unit					

CALCULATE | Reset



per acre rate is displayed in red where the expected result is estimated as \$-3.20/acre (Table 3).

Suppose you do not know either the cost per pound or the quantity of nutrients in the fertilizer applied or you are considering a custom mix of several different fertilizers, each with a different cost. A second tool can help estimate the cost of the mix applied for more than one nutrient (Table 4). The user enters the quantity applied, the formulation or contribution of each type of fertilizer, and the overall cost to estimate: 1. The pounds of crop-available nutrient per acre, 2. The cost per pound of nutrient applied and 3. The total cost of crop-available nutrients applied per acre.

OTHER TIPS TO MANAGE FERTILIZER COSTS

There are several other ways to make fertilizer applications as effective as possible. First, it can pay to shop around to collect prices and application costs from as many suppliers as possible. Lock in prices early wherever possible. Keep in mind timing of application is also key; Wyoming is prone to extreme weather events that can reduce the effectiveness of a fertilizer application. Any fertilizer is too expensive if there is a good chance it will be washed away. Make sure application equipment is in good condition to ensure fertilizer is placed where it will offer the greatest benefit to the crop. There is no one size fits all application method, so work to identify the method most effective for you.

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Table 3. Fertilizer cost results

Fertilizer per Acre	Yield Ton/Acre	Added Yield Ton/Acre	--- Added Costs ---		Added Return [\$200.00/Ton]	Added Return Less Added Costs
			Fertilizer [\$0.98/Pound]	Harvest [\$50.00/Ton]		
0	1.11	---	---	---	---	---
40.0	1.7	0.6	\$39.20	\$29.00	\$116.00	\$47.80
80.0	2.1	0.5	\$39.20	\$23.00	\$92.00	\$29.80
120.0	2.5	0.4	\$39.20	\$17.50	\$70.00	\$13.30
160.0	2.7	0.2	\$39.20	\$12.00	\$48.00	\$-3.20

Table 4. Fertilizer formulation date entry screen

Pounds Applied per Acre	----- Fertilizer Formulation -----				Price per Ton Applied
	Nitrogen (N)	Phosphorus (P ₂ O ₅)	Potash (K ₂ O)	Sulfur (S)	
000.0 lb./A	00	00	00	00	\$ 000.00
000.0 lb./A	00	00	00	00	\$ 000.00
000.0 lb./A	00	00	00	00	\$ 000.00
000.0 lb./A	00	00	00	00	\$ 000.00
000.0 lb./A	00	00	00	00	\$ 000.00
000.0 lb./A	00	00	00	00	\$ 000.00
000.0 lb./A	00	00	00	00	\$ 000.00
000.0 lb./A	00	00	00	00	\$ 000.00
000.0 lb./A	00	00	00	00	\$ 000.00
000.0 lb./A	00	00	00	00	\$ 000.00

CALCULATE | Reset

It may also be of some benefit to consider manure as a commercial fertilizer alternative. Manure can be extremely beneficial to soil structure in addition to offering an excellent source of fertilizer. It could be a cost-effective source of soil nutrients when compared to high-priced commercial fertilizers, although it may not be a good fit or unavailable to some operators. Take a close look at tillage and field operations as well. Transitioning to a reduced till or no-till system can reduce both operating costs in the short term, as well as reducing long term fertilizer needs by increasing available organic matter in the soil.