2015

Production Costs Matter

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May 20, 2015

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Market Report	Year Ago	4 Wks Ago	5/15/15
Livestock and Products, Weekly Average			
Nebraska Slaughter Steers, 35-65% Choice, Live Weight.	147.00	*	161.00
Nebraska Feeder Steers, Med. & Large Frame, 550-600 lb.	245.80	288.14	282.98
Nebraska Feeder Steers, Med. & Large Frame 750-800 lb.	186.84	228.03	220.88
Choice Boxed Beef, 600-750 lb. Carcass.	225.34	259.02	262.07
Western Corn Belt Base Hog Price Carcass, Negotiated.	109.64	62.57	81.59
Pork Carcass Cutout, 185 lb. Carcass 51-52% Lean.	112.15	65.94	82.00
Slaughter Lambs, wooled and shorn, 135-165 lb. National.	136.00	137.18	140.82
National Carcass Lamb Cutout FOB.	369.40	369.07	359.69
Crops, Daily Spot Prices			
Wheat, No. 1, H.W. Imperial, bu.	6.98	4.59	4.89
Corn, No. 2, Yellow Nebraska City, bu.	4.62	3.66	3.52
Soybeans, No. 1, Yellow Nebraska City, bu.	14.65	9.44	9.28
Grain Sorghum, No.2, Yellow Dorchester, cwt.	8.02	7.59	6.98
Oats, No. 2, Heavy Minneapolis, Mn, bu.	3.87	2.97	2.83
Feed			
Alfalfa, Large Square Bales, Good to Premium, RFV 160-185 Northeast Nebraska, ton.	160.00	202.50	190.00
Alfalfa, Large Rounds, Good Platte Valley, ton.	120.00	77.50	*
Grass Hay, Large Rounds, Good Nebraska, ton.	105.00	115.00	120.00
Dried Distillers Grains, 10% Moisture Nebraska Average.	206.00	176.50	170.50
Wet Distillers Grains, 65-70% Moisture Nebraska Average.	67.50	59.50	54.50

*No Market

Production costs matter. Understanding relationships between costs and uncertain output is important in decision making. In the current grain price environment, a stronger understanding of costs and their interaction with other decisions (i.e., risk management), can minimize economic hardship or, in the extreme, reduce the probability of farm liquidation.

Producers operate with a wide variety of costs because of different production systems and preferences. For example, irrigation increases cost while also increasing expected yield. Irrigation also reduces the probability of a lower yield associated with drought. This lower probability of a substandard yield impacts the decision to use forward contracts and the selection of crop insurance alternatives.

The initial thought would be that a high premium crop insurance policy may not be needed because of the presence of irrigation. However, drought is not the only yield risk a producer faces. Crop insurance premiums reflect this. They are lower for irrigated than non-irrigated crops, but not zero.

Having irrigation may not warrant lowering crop insurance levels to obtain a lower crop insurance premium. While this appears prudent at the surface because it is reducing a measureable cost, it can have disastrous effects on income if a bad event occurs.

The above is one example of the many decisions a producer must make relating the cost of an input to an uncertain revenue stream. Other examples

include: (1) Is the marginal value of an additional fungicide application justified by the probability of there being a severe disease outbreak? and (2) Is the machinery cost savings in a no-till environment worth the changes in expected yield and risk?

The relation between how a product is produced and the revenue it generates makes costs matter. Operational costs represent an important piece of production costs. Accurately estimating operation costs generates information necessary for improving decision-making.

In the 2015 University of Nebraska Crop Budgets (http://farm.unl.edu/crops/budgets), the cost for operating field machines ranged from a high of 82% of all non-real estate cost (established alfalfa) to a low of 12% (establishing Roundup Ready alfalfa) with an average of 41%. For corn, the cost ranged from a high of 44% of all non-real estate cost (ridge-till, continuous) to a low of 20% (no-till on dryland) with an average of 30%. Obviously, machinery operating cost is a smaller percentage of total costs for no-till and other chemical-intensive production systems and a larger percentage of total costs for machinery-intensive systems.

When estimating the total cost for using any machine, it is important to consider all costs. Five areas that need to be considered in estimating this expense are labor, fuel, repairs, depreciation, and opportunity costs.

Labor and fuel costs are the most obvious and the easiest to estimate. Knowing the coverage rate (i.e., acres per hour, bushels per hour, etc.) is critical for these estimations.

Dividing the wage rate by coverage rate results in an estimated labor charge per acre.

$$\frac{Wage\ Rate/_{Hour}}{Acres\ Covered/_{Hour}}$$

This does not include the labor needed in most operations to transport the machinery to the field and for daily maintenance such as fueling. The coverage rates for estimating labor costs are more accurate when longer periods of time and more acres are used for calculations. For instance, using 70 acres being covered in two, eight hour days is preferable to timing how long it takes to cover 5 acres because the multi-day calculation would include time spent in daily maintenance and travel.

Estimating fuel costs can be accomplished by dividing the product of fuel price per gallon times gallons of fuel consumed per hour by the coverage rate.

$$\frac{Fuel\ Price/_{Gallon}\ X\ Fuel\ Consumption/_{Hour}}{Acres\ Covered/_{Hour}}$$

Just like calculating labor costs, using longer periods of time to calculate fuel consumption and acres covered results in more accurate calculations since machinery use should include daily maintenance costs and transportation to the field. The American Society of Agricultural and Biological Engineers (ASABE) produces a handbook of standards for calculating machine costs. This handbook recommends adding 15% to the price of fuel for motor and hydraulic oils and materials.

Calculating repair cost is considerably more difficult. There are problems even if detailed repair records are maintained. For instance, there may be a number of years when few repairs are needed and several years when extensive repairs are needed. . The cost for these repairs should be spread over all the years a machine is used.

ASABE standards provide a method to estimate these costs but the function it uses is a complicated one based on the list price of a new, comparable machine, the type of machine, and how much the machine has been used in the past. Since repair costs increase each year, the list price of a new, comparable machine is used to account for these price increases. The type of machine also affects repair cost since some machines like combines have more moving parts that wear out sooner than other machines such as chisels. Finally, how much a machine has been used in the past must be accounted for since repair costs increase as machines wear out.

Depreciation cost are also difficult to estimate. ASABE standards address this issue as well but the functions used for calculations are also complicated and based on the list price of a new, comparable machine, the type of machine, and its age as well as accumulated use.

Opportunity cost may be the most overlooked cost associated with machines. This is the potential income if the money invested in machinery were used elsewhere. Since rates paid by banks on deposits are so low, one is tempted to ignore this cost. However, you should be receiving something from all your investments or there is no reason to invest.

Given the difficulty of calculations using the ASABE standards, some tools have been developed to help producers with estimating costs.

Iowa State University has a download tool for those using Excel spreadsheets. This tool and a description of machinery cost estimation can be accessed online at http://www.extension.iastate.edu/agdm/crops/html/a3-29.html. The tool is straight forward but does require that users have Excel on their computer.

The University of Idaho also has a machinery cost calculator that can be accessed online at http://web.cals.uidaho.edu/idahoagbiz/management-tools/. While this decision aid does not require Excel to use, it does require the program be downloaded on the user's computer. This decision aid is comparable in difficulty to the tool from Iowa State.

RightRisk also has a tool that can be accessed online at http://www.rightrisk.org/ to estimate machinery costs. This tool looks and feels like a spreadsheet but does not require Excel to operate. It does, however, require the tool be downloaded to the user's computer. The RightRisk team is a group made up mostly of faculty from the Universities of Nebraska, Wyoming, and Colorado State.

The above tools calculate costs for field machines. The University of Nebraska has an online tool for calculating costs of a pivot irrigation system. This tool can be accessed at http://agecon.unl.edu/irricost. It is web based, meaning it is accessed via a web browser rather than downloading a program to the user's computer. It was designed to help producers who desire to share a pivot to determine an equitable charge for use. A video is available at this site that shows how this decision aid can be used.

Putting a price on a pivot system used on a neighbor's land is tricky because there are no alternative users. Also, there is no way to know how much use it will get in any given year because rainfall is variable. Because of this, the irrigation cost tool suggests that rental rates be in the form of a fixed amount each year to share fixed costs and a charge per acre inch of water applied to cover variable costs.

Whether you are looking at a field machine or an irrigation system, accurately estimating machine costs can provide important information for management decisions. While not easy, there are programs available without charge online that can help with this task. As with all calculation programs, accurate inputs are essential. The old saying, *garbage in, garbage out*, holds true when using these decision aids.

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