BARNYARDS & BACKYARDS

AUGUST 2014

UNIVERSITY OF WYOMING

University of Wyoming Extension | Profitable & Sustainable Agricultural Systems | RMA Risk Management Agency

Enterprise Risk Analyzer: A new tool for the ranch - II

By James Sedman and John Hewlett

We saw in a previous installment how the Enterprise Risk Analyzer (ERA) tool helped evaluate alternatives for a Big Horn Basin ranch.

The main goals are to assess how all income and expenses are spread across their cow-calf and four feed-producing enterprises (alfalfa hay, native hay, oat hay, and new alfalfa/seeding), determine the profitability of each enterprise, and evaluate the largest expense category for each.

The ERA tool provides an accurate profitability snapshot by showing individual net revenue for each enterprise and its net effect on the entire operation. Previously, we saw the total cash and non-cash income and expenses allocated to each enterprise. Go to http://InsuringSuccess.org to view previous articles.

Net Income Analysis

After income and expense data has been entered, the ERA tool will show each enterprise's effect on net income (NI).

For more information

Visit RightRisk.org to use the Enterprise Risk Analyzer (ERA) tool for your risk management planning; simply select "Risk Management Tools" under the Resources tab to begin. The Excel-based spreadsheet tool includes preloaded Big Horn Basin farm and ranch scenarios along with a user guide. RightRisk.org has numerous other risk management planning resources including online tools, courses, and producer profiles to assist in your risk management planning needs.

Under the NI Analysis tab, values are shown for each minimum, most likely, and maximum cash income and net revenue scenario. These estimates are made using the range of prices and yields entered for each enterprise under the General tab in the ERA tool.

All enterprises show a positive return when considering only cash expenses in our example. When non-cash expenses are introduced, the whole farm net income drops to a negative $75,646 due primarily to the large non-cash adjustment in the cow-calf enterprise. This information is summarized in Table 1.

Break-even Analysis

Further analysis using the ERA tool can provide break-even prices and yields for each enterprise along with probability estimates for each scenario. This allows the user to compare the three expected prices and yields (minimum, most likely, and maximum) with the cost data.

Risk analysis like this helps evaluate the likelihood of future profitability based on expectations for changing prices or yields. In the Big Horn County ranch example, operational changes can be made based on these expectations (ideally before it is too late).

The primary enterprise in this example is cow-calf. The tool generates break-even values based on price and yield for both cash expenses and total gross expenses.

The break-even price for the cow-calf enterprise in the most likely yield scenario (sales of 374 pounds per cow) is $0.64 per pound for cash expenses and $1.37 per pound for gross expenses.

The ERA tool generates a probability graph based on these figures to show the probability of a given price covering expenses (Figure 1).

NET INCOME ANALYSIS	WHOLE FARM	Cow-Calf	Native Hay	Oat Hay	Alfalfa Establishment	Alfalfa - Baled
FARM REVENUE						
TOTAL FARM INCOME - CASH	164,250.00	121,759.00	12,380.00	2,765.00	2,306.00	25,040.00
TOTAL NON-CASH INCOME ADJUSTMENTS						
GROSS FARM REVENUE	164,250.00	121,759.00	12,380.00	2,765.00	2,306.00	25,040.00
FARM EXPENSES						
FARM EXPENSES - CASH	109,525.00	86,843.00	6,557.00	1,756.00	2,297.00	12,072.00
FARM EXPENSES - NON-CASH EXPENSE ADJUSTMENTS	130,371.00	98,550.00	11,245.00	2,709.00	2,536.00	15,331.00
GROSS FARM EXPENSES	239,896.00	185,393.00	17,802.00	4,465.00	4,833.00	27,403.00
NET FARM INCOME FROM OPERATIONS	(75,646.00)	(63,634.00)	(5,422.00)	(1,700.00)	(2,527.00)	(2,363.00)

Net Income RISK Analysis	WHOLE FARM	Cow-Calf	Native Hay	Oat Hay	Alfalfa Establishment	Alfalfa - Baled
NET Enterprise CASH INCOME (cash income - cash expenses)						
Minimum	14,397.00	15,115.12	1,071.64	(478.46)	(1,019.30)	(292.00)
Most Likely	54,725.00	34,916.00	5,823.00	1,009.00	9.00	12,968.00
Maximum	215,544.50	151,077.62	9,771.64	2,414.04	1,873.20	50,408.00
NET Enterprise REVENUE (gross revenue - gross expenses)						
Minimum	(115,974.00)	(83,434.88)	(10,173.36)	(3,187.46)	(3,555.30)	(15,623.00)
Most Likely	(75,646.00)	(63,634.00)	(5,422.00)	(1,700.00)	(2,527.00)	(2,363.00)
Maximum	85,173.50	52,527.62	(1,473.36)	(294.96)	(662.80)	35,077.00

Table 1. Big Horn Basin Ranch Net Income Analysis

Figure 1. Break-even Price Probabilities for Cow-Calf Enterprise

James Sedman *is a consultant to the Department of Agricultural and Applied Economics in the University of Wyoming College of Agriculture and Natural Resources, and* **John Hewlett** *is a farm and ranch management specialist in the department. Hewlett may be reached at (307) 766-2166 or hewlett@uwyo.edu.*

Is fertilizing irrigated pastures, hayfields, a waste of your money?

By Dallas Mount

(Courtesy *Barnyards & Backyards* magazine)

Irrigated pasture or hayfield owners may be considering fertilizer to increase production.

How much fertilizer should, or should not, be applied? The right answer depends on several factors and may change year to year.

Considerations include:

- Intended use of the pasture/hayfield,
- Nutrients in the soil,
- Plants present in the pasture/hayfield,
- Expected irrigation water supplies, and
- Price or value of crop and cost of fertilizer and application.

Intended Use of Pasture/hayfield

Hayfields have a higher fertilizer requirement than pastures. Hay harvested from a field and fed to livestock in another location extracts nutrients from the field. Each ton of grass hay contains approximately 40 pounds of nitrogen and 20 pounds of phosphorus. Some can be replaced through natural cycles, but if the productivity of the site is to be maintained, then a large portion needs to be replaced. About half of the nitrogen in the hay or forage is returned to the soil if grazing the forage or feeding the hay at the same location. The other half is lost to the atmosphere.

Nutrients in the Soil

Start with a soil test. This will show the texture of the soil (i.e. sand, loam, clay) and the nutrients present. Most farming communities have a fertilizer dealer or farmer's co-op that will take and analyze soil samples. Several labs are available that will test the soil if you prefer taking the samples yourself. Contact a local University of Wyoming Extension office for soil sampling tips and plant or fertilizer recommendations.

Many extension offices also have soil probes available to make taking soil samples easier. Follow recommended practices in taking the soil sample or the results from the lab will not be very useful. Here is a guide for taking an accurate soil sample http://bit.ly/soilsampling.

Plants Present in Pasture or Hayfield

What will be grown will determine what nutrients are needed. Grasses generally have a high nitrogen requirement, and this will increase with more productive grasses. Alfalfa and other legumes have a symbiotic relationship with bacteria that fix atmospheric nitrogen. The nitrogen requirement is reduced with more legumes present; however, most legumes have a higher phosphorus requirement.

Nitrogen tends to leach through the soil with water or volatilize into the atmosphere unless quickly used by the plant. A legume and grass mix is ideal if the site is a pasture, but often these mixes create other management challenges, such as bloat. These challenges can be overcome with careful management. Legumes such as clovers are an option to fix nitrogen for the grasses.

Expected Irrigation Water Supplies

Irrigators depending upon snowpack should have a pretty good indication of water supplies by mid- to late March. If your area is likely to be short or run out of water early in the growing season, then decrease the amount of nitrogen applied to grass hay meadows.

An Example

The question of fertilizer comes down to economics. You need the following information: What impact will fertilizer have on yield? How much will the fertilizer and application cost? What is the value of the crop?

Your local extension office can help obtain the answers. Let's run an example to see how this might turn out.

Apply 80 pounds of nitrogen to grass hayfield

Yield without fertilizer: 1.2 tons per acre

Yield with fertilizer: 2 tons per acre

Cost of fertilizer: $0.80/pound nitrogen or $65 for 80 lb plus $5/acre application cost = $70/acre

Value of one ton of hay: $150. Value of additional 0.8 ton: $120

Value of additional 0.8 ton less fertilizer cost = $120 - $70 = $50

Applying 80 pounds of nitrogen resulted in an additional $50 of value from the acre of ground. If this is harvested hay, the additional costs of harvesting the additional 0.8 ton should also be considered.

This example is not to suggest you will have similar costs or increases in yields. Use your own estimates based on soil type, soil fertility, water availability, plant potential, current cost of fertilizer, and current value of the crop.

Dallas Mount *is a University of Wyoming Extension educator based in Platte County and serving southeast Wyoming. He can be reached at (307) 322-3667 or at dmount@uwyo.edu.*