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Enterprise Risk Analyzer: A new tool for the ranch

By James Sedman and John Hewlett

Many of today's ranch businesses include more than one enterprise - multiple livestock or cropping enterprises such as different hay and forage production for feed.

Properly analyzing these individual enterprises is an integral part of risk management planning.

The Enterprise Risk Analyzer (ERA) tool gives producers a way to examine the effect of all cash and non-cash income and expenses on an individual enterprise level. The tool divides direct cash expenses (such as feed, fuel, and vaccines) among enterprises, as well as indirect or non-cash expenses (such as owner labor and depreciation) that are generally more difficult to assign to individual enterprises.

Big Horn Basin Ranch Example

The ERA tool provides three main benefits: profitability analysis for each enterprise and its contribution on the overall business; expense analysis by category for each enterprise; and breakeven yields and prices for each enterprise.

This information is critical for producers to make necessary adjustments in their business planning and best allocate capital to enterprises to maximize profits.

The Big Horn Basin ranch is primarily a cow-calf operation, running approximately 365 cow-calf pairs, along with several smaller cropping enterprises generating feed for the cow herd. The general tab in the ERA tool contains the information for the various enterprises. In our example, the ranch has a cow-calf enterprise and several cropping enterprises: native hay; oat hay; alfalfa hay (establishment year); and baled alfalfa hay.

The table below shows the minimum, most likely, and maximum price and yield values for each enterprise. This information provides the basis for further analysis.

The next step is to input the ranch's IRS 1040 Schedule-F information to allocate income and expenses across the different enterprises including depreciation for all assets.

The user then allocates revenues and expenses in the allocator tab. All cash and non-cash items are divided among enterprises, with the unallocated amount shown on the right.

Remember to use the same method of dividing non-cash and indirect costs and returns (such as allocating dollar amounts as a percentage of acreage used or gross sales) consistently for all items or results may be distorted.

The tables below summarize income and expenses for the ranch on an enterprise basis.

We will look closer at the net income and breakeven analysis using the ERA tool for this example ranch in the next installment in this series.

For more information

RightRisk.org is an interactive, comprehensive website for producers at any stage in the risk management planning process. In addition to the Enterprise Risk Analyzer (ERA) tool, the site contains numerous budgeting and planning tools in spreadsheet form. Simply logon to RightRisk.org and select "Risk Management Tools" from the "Resources" tab. The ERA tool includes a step-by-step user guide with example farm and ranch scenarios already loaded.

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Stochastic Elements	Estimate	Yield per Enterprise Unit	Units (bu/ton/lbs)	Price per Unit	Expected Revenue per Enterprise Unit *(most likely)*
Cow-Calf	*Minimum*	350	lbs.	$ 0.65	$ 281.75
	Most Likely	373.97		$ 0.75	
	Maximum	400		$ 1.50	
Native Hay	*Minimum*	1	ton	$ 65.00	$ 105.96
	Most Likely	1.5		$ 70.64	
	Maximum	1.75		$ 80.00	
Oat Hay	*Minimum*	1.5	ton	$ 65.00	$ 211.92
	Most Likely	3		$ 70.64	
	Maximum	4		$ 80.00	
Alfalfa Establishment	*Minimum*	1.5	ton	$ 65.00	$ 176.60
	Most Likely	2.5		$ 70.64	
	Maximum	4		$ 80.00	
Alfalfa - Baled	*Minimum*	1.5	ton	$ 75.00	$ 240.00
	Most Likely	3		$ 80.00	
	Maximum	4		$ 150.00	

Table One. Enterprise Information for Big Horn County Ranch

Enterprise Allocator Worksheet		Cow-Calf	Native Hay	Oat Hay	Alfalfa Establishment	Alfalfa - Baled
FARM REVENUE						
GROSS FARM REVENUE (cash + non-cash)		121,759	12,380	2,765	2,306	25,040
TOTAL FARM EXPENSES - CASH		86,843	6,557	1,756	2,297	12,072
Farm Expenses - Non-cash Expense Adjustments						
Depreciation Expense (average of beginning and ending)	-	32,209	2,984	936	831	4,843
Supplies & Prepaid Expenses - Decrease (Increase)	-					
Investment in Growing Crops - Decrease (Increase)	-					
Crops Held for Feed NOT for Sale - Decrease (Increase)	-					
Accounts Payable - Increase (Decrease)	-					
Short Term Notes Payable - Inc (Dec) - Not Ann Op Loan						
Accrued Interest (average of beginning and ending)	-	15,320	2,318	459	424	2,584
Acc. Prop, R.E., Payroll Taxes - Increase (Decrease)	-					
Accrued Lease Payments - Increase (Decrease)	-					
Owner Labor - annual	-	12,275	475	111	177	1,110
Management (owner) - annual	-	14,675	893	238	323	1,694
Return on Equity Capital - annual dollar amount	-	24,071	4,575	965	781	5,100
TOTAL NON-CASH EXPENSE ADJUSTMENTS		98,550	11,245	2,709	2,536	15,331
GROSS FARM EXPENSES (cash + non-cash)		185,393	17,802	4,465	4,833	27,403
NET FARM INCOME FROM OPERATIONS		(63,634)	(5,422)	(1,700)	(2,527)	(2,363)

Table Two. Example Ranch Total Allocated Income and Expenses

Monitor soil moisture to increase irrigation efficiency

What options do you have?

By Caleb Carter

Monitoring soil moisture can increase irrigation efficiency by reducing runoff and deep drainage losses and by avoiding crop water stress.

Many methods exist that reflect the amount of money invested, level of technology used dependent on an irrigation method, and management strategies and goals.

Important Considerations

Consider the irrigation method and the level of control you have on the amount and timing of irrigations. The more control, the more detailed information that can be used. Consider the crops and soils. Some devices work better in annual than perennial crops. Some are better in coarse soils versus fine soils. Can you go to the field every couple of days? Or do you want a more automated system?

Different methods may give slightly different readings; they will usually track changes in soil moisture similarly. Look at trends as soil moisture changes, and remember, it is as much an art as a science.

What Options Exist?

The least-expensive technique is the look-and-feel method. The feel and appearance of soil changes with variations in soil moisture and texture, and with practice can be estimated to within about 5 percent. Take walnut-sized soil samples at 1-foot increments for the root zone of the crop and in at least three sites depending on soil and crop variability. Use a soil probe for best results – especially for deep soil samples. For more information, refer to the Natural Resources Conservation Service document "Estimating Soil Moisture by Feel and Appearance" http://bit.ly/soilfeel.

A meter or sensor is a step up. These include tensiometers or electrical resistance blocks. A tensiometer is an air-tight, water-filled tube with a porous ceramic tip that is stuck in the ground. On the top is a vacuum gauge. The device measures soil water tension displayed in centibars (cb). With an effective range of 0 to 80 cb, these are best suited for coarse soils or horticultural applications in which the soil is not allowed to dry excessively. With no cables or buried blocks, they are good for cultivated fields and annual crops.

Although easy to use, tensiometers need to be serviced regularly. This means filling with water and using a pump to create the vacuum. Price is based on length, ranging from 6 to 48 inches, and $45 to $80 respectively.

Electrical resistance blocks come in two main varieties: gypsum blocks and granular matrix sensors. Both absorb water from the surrounding soil and work off the principle water conducts electricity; there is less electrical resistance with increased soil moisture.

Gypsum blocks range from $5 to $15 apiece and last about a year. Granular matrix sensors range from $25 to $35 apiece and last three to seven years. The most important factor in reliability is good soil contact, and is the number one reason for poor performance. Install the blocks/sensors in a representative location in the field, minimizing soil compaction and damage to canopy cover.

There are two options to read electrical resistance blocks: a hand-held meter or a data logger. Hand-held meters cost $150 to $600, are portable, can be used to monitor multiple locations, and have no buried wires. A producer might have to wade through a wet crop to where the sensors are buried to take the reading. This process only gives real-time readings; there are no readings showing the change in soil moisture over time.

Data loggers cost $60 to $500, read several sensors on a regular schedule, store the data, and graph it over time. Soil moisture trends can be quickly seen. Buried wires are required, so these may be more suited to perennial crops.

Soil moisture monitoring systems are becoming more practical and feasible for the average producer as technology advances and prices fall. Still, they should not replace personal observations and experience. Rather, the new information can be combined with personal observations to make better irrigation decisions.

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