

Will it Pay? Economics of Improving Grazing Systems

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So, will improving grazing systems pay? The answer is, it depends. It depends on the current situation and what can be expected out of the new grazing system.

Changes in management can affect any one or more of three areas: production, revenue, and cost. Very seldom will a change in management affect only one of these. In order for a change to be profitable additional value must be more than increased costs, or costs must be reduced more than value lost.

A method that producers can use to examine the potential impacts of a proposed management change on profits is Partial Budgeting. Although it can be made into a complicated process, partial budgeting can be a very simple yet effective method to determine changes in profits. It is important to realize that in constructing a partial budget, you are concerned only with CHANGES. Thus, total numbers of acres, pastures, revenue, etc are not needed; only differences in what is impacted.

Essentially you need four things to develop a partial budget: additional costs, reduced revenue, additional revenue, and reduced costs. If the additional revenue plus reduced costs equals more than the additional costs and reduced revenue then a proposed change is profitable. Anything else is either a breakeven or losing proposition. Not all proposed changes will impact all four areas but it is likely that more than one area will be affected.

When developing a partial budget you should think through everything that will be necessary to implement the proposed change and what the effects of these changes will be. These effects can then be placed in one of the four areas mentioned above.

Additional Costs – Will there be additional expenses or costs for the proposed change? Items of additional expenses may include clover seed, fertilizer, fencing, labor, the annual ownership costs of additional cows, etc. If a change involves a capital investment such as additional cows, permanent fencing, etc. include only the annual ownership costs of these items. Two good numbers to use include annual depreciation plus interest, taxes, and insurance, or annual payments.

Reduced Revenue – Sometimes a proposed change may involve reducing revenue either through reduced stocking rates, reduced weaning weights, or decreased grass production. In any case, be sure to place an accurate value on the lost production as it will impact revenues.

Additional Revenue – In some cases a proposed change may increase revenue either through increased conception rates, larger weaning weights, or higher stocking rates. Be sure and include all associated revenue. For instance, if you can increase the number of cows grazed, you should include the additional revenue from calves, as well as the additional cull revenue from cows and bulls.

Also, by implementing a change you may be eligible to receive some government assistance or cost-share. If that is case, include the annual government payments or cost-share as additional revenue. If the government assistance is a one-time payment, annualize the payment over the life of the associated investment, or subtract the difference from the investment amount and depreciate the difference.

For instance, say you decide to go to a fast rotational grazing system on 50 acres. By doing so, you are eligible for annual payments in the Conservation Security Program (CSP) of \$15 per acre or \$750 per year. You would include this \$750 under the additional revenue part of the partial budget.

Reduced Cost – Sometimes the result of a change is a reduction in cost. For instance, adding clover to an all grass pasture could reduce the cost of commercial nitrogen fertilizer. Again, include the cost that you will NOT incur as a result of adopting the change.

In developing a partial budget the first thing you need to know is how will the prospective change impact production. Secondly, will there be additional costs, reduced costs, or both? Finally, how will revenue be affected?

Examples

To illustrate how partial budgeting can work two examples are presented below. The first example compares going from a continuous grazing system to a rotational system and the second example looks at adding clover and reducing commercial nitrogen (N) fertilizer application. Keep in mind these are only examples, **you should use your own numbers for your operation.**

Example 1 - Going From Continuous To Rotational Grazing

Rotational grazing is often touted as being more profitable than continuous grazing. To examine the profitability of this project we need to make the following assumptions about our current situation:

1. We have 200 acres of Fescue-Bermuda pasture
2. The 200 acres is divided into three pastures of 60, 70, and 70 acres
3. Currently we have 100 beef cows (2 acres/cow) with a 85% calf crop and a 500 pound calf.
4. Our cows consume 1.50 tons of hay per cow per year

According to the research conducted by Drs. Hoveland, McCann, and Hill, going from a continuous system to rotational system will allow us to increase our cow stocking rate from 2 acres per cow to 1.45 acres per cow. They also say we can reduce our hay needs by an average of 31%. If we use this information in a partial budgeting form we end up with something similar to Example 1.

Additional Costs

We incurred two costs for going to a rotational system: fencing and breeding stock. Notice that the cow costs are broken into two parts, variable costs and fixed costs. Variable costs for cows are figured at \$375 per cow. Because breeding stock (cows and bulls) is an investment, you

should NOT include the purchase price for the cow in one year. What you should do is to include a depreciation plus interest charge for one year for any breeding stock. Instead of using depreciation, you may chose to include the annual payment amount if you borrow money to purchase breeding stock or fences.

Estimating fencing cost can be tricky because of the different types of fences. For instance, a permanent type fence such as a barb-wire, high-tensile, or net wire would be depreciated, while a “disposable” item such as poly-tape would probably be expensed in one year. In any case, include only the amount you expect to spend on an annual basis. The fencing cost estimates for this exercise came from the Beef Cattle Management & Marketing Systems available from your local county agent.

Additional Revenue

Because we added more cows we also had more pounds of weaned calves to sell. We also had additional cull revenue from the cows and bull. Keep in mind we are only adding the additional revenue from the extra 38 cows.

Reduced Costs

In addition to increasing the stocking rate, we are also able to reduce hay needs per cow. However, we now have more cows so we need to examine the net effect. The arithmetic for this scenario is shown on the partial budgeting example.

Adding it All Up

Once the totals for each section are added we can subtract the total additional cost plus reduced revenue from the sum of additional revenue and reduced costs. In this instance, we would expect to lose \$835 each year after we had our fences installed and our cows bought.

It is important to note that the annual cost of the cows relative to calf sales price, not the change to rotational grazing is the culprit to the loss in profits. If we just go to rotational grazing and do not add anymore cows, our profits increase by \$3,000 due to the cost savings from reduced hay needs. One final observation, rotational grazing becomes more economical as the price of forage (hay) increases.

Example 2 – Replacing Commercial Nitrogen with Clovers

Utilizing clovers in pastures is often promoted to reduce the dependence on commercial nitrogen (N) and increase plant diversity. Also, in toxic-fescue clovers have been shown to reduce fescue toxicity and increase weaning weights.

In Example 2, we compare adding Durana or Patriot clover to 100 acres using the same base stocking rate (2 acres per cow) from Example 1. By doing so, we eliminate the need for commercial N on 100 acres. However, we increase our seed cost plus our phosphorous and potash needs. We also decrease our overall stocking rate by 10-15%, but we increase our pounds weaned per calf by 20 pounds.

Notice in this example we have a reduction in revenue from the fewer cows, but we have an increase in revenue due to heavier weaning weights. In the final analysis, it pays in this example to replace commercial N with fertilizers even with a reduced stocking rate.

Keep in mind, this example assumes a base calf crop of 85%. If the pasture were heavily infected with toxic-fescue, you could increase calf crop percentage and weaning weights by incorporating clovers into the pasture. Also, the currently and expected high price of nitrogen fertilizer makes this a very attractive proposition. As was stated previously, use your numbers for fertilizer and seed cost if available.


Summary

Determining the economics of improving pasture and grazing systems is not an easy task. However, by utilizing a partial budgeting technique such as the one shown here, producers can make informed decisions. Information needed to develop a partial budget includes the current situation, expected impact on production, revenue, and cost.

Producers should be very careful to use production numbers relevant to their situation. For instance, do not assume a production response in fescue pastures will hold true for Bermuda grass. Also, look at several “what-if” scenarios. See how many additional pounds will need to be sold to breakeven. What impact do calf prices and seed costs have on the profitability of the venture?


As always, contact your local county extension agent to get the latest information on improving you pastures and making a profitable decision.

Example 1 Partial Budgeting Form

Problem: Go from continuous to rotational grazing			
Additional Costs: <ol style="list-style-type: none"> 1. Depreciation and interest on 38 additional cows @ \$900 each 8% interest for 6 years = \$4,743 2. Depreciation and interest on 1 additional bull @ \$1,800 @ 8% interest for 3 years = \$419 3. Additional variable costs for 38 cows = \$14,250 4. Fencing - additional annual cost = \$600 <p style="text-align: right;">Total additional costs = \$20,012</p>	Additional Revenue: <ol style="list-style-type: none"> 1. 38 additional cows with 85% calf crop, weaning 500 pound calves @ \$95/Cwt. = \$15,342 2. Cull 6 cows weighing 1,150 pounds @ \$42/Cwt. = \$2,898 3. Cull 1 bull weighing 1,800 pounds @ \$48/Cwt. every 3 years = \$288 <p style="text-align: right;">Total additional revenue = \$18,529</p>		
Reduced Revenue	Reduced Costs: Net difference in hay costs 100 cows consuming 1.50 t/yr of hay @ \$100/t = \$15,000 (continuous) 138 cows consuming 1.04 t/yr of hay @ \$100/t = \$14,352 (rotational) Reduced costs = \$648		
A. Total additional costs & reduced revenue	\$20,012	B. Total additional revenue & reduced costs	\$19,177
			\$20,012
Net Change in Profit (B minus A)			(\$835)


Example 2 Partial Budgeting Form

Problem: Replace commercial nitrogen with clovers on 100 acres (2 cows/acre)			
Additional Costs: <ol style="list-style-type: none"> 1. 3#/acre of Durana or Patriot @ \$5.25/acre good for 3 years = \$525/year 2. Additional 10# phosphorous/acre per year @ \$0.32/# = \$320 3. Additional 10# potash/acre per year @ \$0.21/# = \$210 <p style="text-align: right; margin-top: 20px;">Total additional costs = \$1,055</p>		Additional Revenue: <ol style="list-style-type: none"> 1. Additional 20 pounds on calves from 43 cows @ 85% calf crop sold for \$95/cwt. = \$694 	
Reduced Revenue <ol style="list-style-type: none"> 1. Stocking rate reduced by 15% → 7 cows @ 85% calf crop, 500 pound calf @ \$95/Cwt. = \$2,826 		Reduced Costs: <ol style="list-style-type: none"> 1. Savings on 2 applications of 60#/acre of commercial nitrogen @ \$0.55/pound = \$6,600 2. 7 fewer cows @ \$375/cow = \$2,625 <p style="text-align: right; margin-top: 20px;">Reduced costs = \$9,225</p>	
A. Total additional costs & reduced revenue	\$3,881	B. Total additional revenue & reduced costs	\$9,919

	\$3,881
Net Change in Profit (B minus A)	\$ 6,038

Partial Budgeting Form

Problem:			
Additional Costs:		Additional Revenue	
Reduced Revenue		Reduced Costs:	
A. Total additional costs & reduced revenue	\$	B. Total additional revenue & reduced costs	\$



	\$
Net Change in Profit (B minus A)	\$