

# INCENTIVES TO CONSIDER ROTATIONAL STOCKING

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## Introduction

The largest cost for an Indiana cow/calf producer is feed. Ultimately, feed is over 50% of the cost of production with the largest part of the feed expense being forage. If producers are able to increase the productivity of their forage they would then be able to decrease the cost of supplemental feeds. By implementing grazing management systems such as Management Intensive Grazing (MIG), better known as rotational grazing, producers can do just that.

Because of the rest cycle in MIG, hay can be produced. This does two things. It encourages young growth, which is more palatable to the cattle and the hay produced can be used as feed when foraging isn't an option.

The question really is "is it worth it?" To answer that question some analysis has to be done. The Oldham site at the Feldun-Purdue Agricultural Research Center will be used as an example. This site was set up using a buried water line and electric fence. To tell us if this is a project worth undertaking two analyses should be done. First, is this economically profitable and if it is, is it financially feasible?

## Economic Profitability

To find out if MIG is economically profitable a Net Present Value should be done. This tells what the income this project will bring in the future is worth today. This investment should have a life

of 15 years, so that is the length of the analysis. First you have to know what rate of return this investment could make if invested elsewhere. This rate is the discount rate. When calculated from the averages of the top 25% of beef producers in Illinois, this rate of return was only 3.6%. Because you could get a higher rate by doing other projects or for investing in the stock market, the 10 year average return from the S&P 500 (11.36%) was used so this project could be compared to other options.

Next the amount of cash income for the MIG is found. Because hay prices are volatile four different average prices (50, 60, 70, and 80 \$ per ton) were used. The average price was used continually throughout the 15 year life. This means that this price is what you would normally get over that period of time. These prices represent either one of two things, what you could get if you sold the hay or what you would have to pay for hay if you hadn't produced your own. The Oldham site produced an average of 38 tons per year, so the prices were multiplied by the average tonnage to give cash income. (Table 1.)

Cash expenses include fence replacement, hay equipment and miscellaneous. Because electric fence has a shorter life than a buried water line, it was decided that the fence would need to be replaced after 12 years so the cost of replacement would be a cash expense in that year. To harvest the hay it is necessary to either own the machinery or hire a custom harvester. To

simplify analysis, a custom rate of \$43/ton was used. This is what it would cost for a custom harvester and is similar to what it would cost a producer to do it themselves if all costs associated with haying such as fuel, labor and hours of machine use are included. There are also miscellaneous costs that must be included for things like fence repair and time and effort to move the cattle. These are estimated at 5% of the cost of haying. Income taxes are also included as a separate expense at 28.4% (25% federal and 3.4% Indiana State).

When expenses and taxes are taken from cash income, annual net cash flow is found. These must then be discounted using the discount rate to find what that cash flow is worth *today*. These present values are then added together and the cost of the investment is subtracted to find a Net Present Value. A different value was found for all four average prices but only two were positive numbers (Table 1).

This tells us several things. First, this is only a “go” project when prices are above \$60.78/ton (where NPV is 0). Secondly, any price above \$61 is returning above the rate of the S&P 500(11.36%) so the MIG is a better investment than the stock market. Lastly, the amount of the NPV can be added to or subtracted from the initial investment price to give a new price that would be the maximum that should be paid. (For \$60 hay the max investment is the initial investment of  $\$3347.75 + -42.25 = \$3305.02$ )

However, if hay prices are below \$61/ton this analysis says the MIG isn't worth it. But, before deciding against MIG several other factors should be

looked at. This analysis didn't include a change in stocking rate or increased grazing days. It also didn't look at herd health improvements or improvements in environment.

### **Financial Feasibility**

Being economically profitable doesn't necessarily mean that MIG is financially feasible. Although a water line and electric fence are not a large investment comparatively, they can put a significant dent in a cash flow. A five year equal payment loan with 8% interest could be taken out to help soften the blow (Table 2).

Tax savings on interest should be taken out of the payment, and then the payment is subtracted from the annual net cash flow. This determines if there is a surplus or deficit. If there is a deficit at any point the MIG is not considered financially feasible.

Only \$80/ton average was financially feasible. \$70/ton average lost money in year 12 when the electric fence was replaced and both \$50/ton and \$60/ton had trouble making the payment. There are several options to help make these more feasible. First there is the possibility of supplementing the grazing system from other parts of the business. This could be from anywhere such as calf or other crop sales, to off farm income. There is also the possibility of changing the terms of the loan like paying a down payment. Lastly the entire amount could be paid in the first year to avoid a loan.

## **Conclusion**

Management Intensive Grazing is profitable if average hay prices are above \$60.78. It is not, however, financially feasible unless hay prices are above \$77. There are many other factors which were not included in this analysis that could change these outcomes such as increased stocking rates and grazing days along with improvements to herd health and the environment. More complete analysis will follow.

**Table 1.**

<b>Average hay price</b>	\$50.00	\$60.00	\$70.00	\$80.00
<b>Cash Income</b>	\$1,900.00	\$2,280.00	\$2,660.00	\$3,040.00
<b>NPV</b>	-\$1,960.47	-\$42.25	\$1,875.97	\$3,794.20

**Table 2.**

<b>Payment</b>	<b>Payment Amount</b>	<b>Principle</b>	<b>Interest</b>	<b>Balance</b>
1	838.39	570.59	267.80	2776.86
2	838.39	616.24	222.15	2160.62
3	838.39	665.54	172.85	1495.08
4	838.39	718.78	119.61	776.29
5	838.39	776.29	62.10	0.01