

Pushing the Pencil on Agronomic Decisions

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Agronomic decisions made this time of year often have significant impact on the profitability of crop production enterprises the following year. All too frequently, these decisions are made with little formal economic assessment, instead by a “seat of the pants” judgment by the crop producers and his advisors. Improving your skills on using some fundamental economic assessment tools can help provide good insight into other aspects of the issue and improve your chances of making the best economic decision.

Recently someone posed the question about including soybeans in a mostly corn rotation on a dairy farm. My initial inclination was that it probably is a profitable alternative but this depends on a number of factors. The value of the corn, the relative input costs of each, the farms need for corn or corn silage as feed, and the benefits that could be obtained from the inclusion of soybeans in the rotation. This is a typical cropping decision on a complicated Pennsylvania farm.

One solution is to use a partial budget analysis to address the problem. This approach helps to customize the solution for a particular farming operation. A partial budget is well known to economists but is often not that well utilized by agronomists in helping producers with cropping decisions. Penn State has an excellent publication on partial budgeting which can be found online at (<http://pubs.cas.psu.edu/freepubs/pdfs/ua366.pdf>) or can be obtained through our county extension offices.

There are seven basic steps to partial budgeting: 1) state the proposed change, 2) list the added returns, 3) list the reduced costs, 4) list the reduced returns, 5) list the added costs, 6) summarize the net effects and 7) consider non-economic factors.

In our example the proposed change might be to change from growing 500 acres of corn to 400 acres of corn and 100 acres of soybean. The added returns would be the revenue from soybeans, let's say 4500 bushels at 9.00/bushel or or \$40500. Reduced costs would be the reduced variable costs for corn grain production on 100 acres, let's estimate those at \$350/acre, or \$35000. The reduced returns would be the reduced income from corn grain of 150 bushels/acre or 15000 bushels @4.00/bushel or \$60000. The added costs would be the cash costs of growing soybeans, let's estimate that at \$240/acre or \$24000. The next step is to add up the positive (\$40500+\$35000) and then subtract the negatives (\$60000+\$24000). This indicates the change may cost us \$8500 this year- not what I would have expected.

But there are also several non-economic factors to consider; increased crop diversification, improved weed control in the long term, more timely corn planting and harvesting and the long term economic impacts. Consider that in the second and subsequent year of this rotation, there might be more added returns from the higher yield of a 100 acres of rotated corn (10 bu/a or \$4000/year), less need for insect control (\$1500/year) , less need for N fertilizer (50 lb N x 100 acres x \$0.50/lb N or \$2500) and less corn harvest losses (5 bu/A x 100 acres or \$2000/yr). Thus under this scenario, in the long term, the soybeans would add a net positive return of \$1500 per year while providing substantial non-economic

benefits. Other factors, such as substituting the soybeans for purchased soybean meal could add to the benefits of the proposed rotation in this analysis.

As you are faced with important economic decision making this winter, try using a partial budget to sort out the potential economic consequences. Be sure to also consider the non economic factors and also the long term economic effects of your decisions. With careful analysis and good estimates of future costs and revenues, this approach should help all of us make better agronomic decisions founded on some good economic data.