

FARM ECONOMICS AND RISK MANAGEMENT

-- A GROWER PERSPECTIVE

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INTRODUCTION

My aim will be to cover two general areas. The first will be a brief overview of the farm economy and a look at the crop economics we face in planning for the 2008 crop season. The second will be a presentation of some of my thoughts on risk management. The objective will be to provide some insights into the thinking of your customers as we head into spring 2008. An overriding disclaimer is that, in this volatile agricultural economy, words written in early January may be superseded by events before mid-February.

FARM ECONOMICS

We all know that the agricultural economy is pretty good (a Minnesotan uses “pretty good” when the rest of the world says “exuberant”) as we head into the 2008 crop season. All available indicators say so. Grain prices are high. The CRB all-commodity index is about 450, which is twice the level of five years ago. Net farm income in 2007 may be a record high. Land prices, which are a good indicator of agricultural investment capital available, are soaring. A recent magazine article was headlined “The Farm Sale Circus”. (Farm Futures, December 2007). Cash land rental rates in our community are up 20 – 30% from two years ago. Farm equipment salesmen have had people standing in line outside their door. The farm debt/equity ratio has been dropping since 1990. Now at about 10% nationally, it is the lowest many years.

But, the rising cost reality has yet to hit hard. The University of Minnesota Center for Farm Financial Management projects corn production costs for 2008 to be \$489/A (costing land at \$134/A). That is 47% above 2002 costs. Soybean costs is projected at \$321/A. That is 38% above 2002 costs. That projection may underestimate fertilizer costs and includes land at far below newly-negotiated case rental rates.

Public policy issues are not now on the front burner. But, it is worth noting that under the “new” farm bill not much has changed for most crop farms. The federal government “safety net” is far below current production costs, so there is not much safety in the safety net. While both debt and interest rates are low, no doubt credit availability and cost sometime in the future will again become issues. We don’t know the policy direction which will be taken to deal with consternation in the financial markets, and how that will affect agriculture. We do know that the federal debt level will require interest rates which will make treasury bonds attractive to buyers.

In short, we go into the 2008 crop production season with the following key observations:

- Farm financial condition is good
- Farmers feel good
- All inputs tied to crude oil prices are cause for consternation
- The impact of rising input costs has yet to hit
- The impact of measures to deal with the financial calamity is unknown
- This an election year

Given what we know and what we don’t know, what will we grow in 2008? Corn, soybean, and wheat markets are all bidding for acres in 2008. We are making planting decisions at a time when daily market price fluctuations are as great as annual movement once was. The combination of the biofuels market and the impact of huge fund participation in commodity markets continue to be felt. In a climate of extreme uncertainty, it is most likely that farmers will weight planting decisions heavily in the direction of long run perspectives. In the northern Corn Belt this means less corn, more soybeans, and more wheat than in 2007. Added to the decision mix is awareness that a La Nina pattern is developing in the Pacific Ocean. This tends to be associated with moisture shortages in the Corn Belt (but not necessarily in the Northern Corn Belt).

For 2008 crop planning, I have found it useful to work with the Rotation Profitability Calculator, developed by Michael Duffy at Iowa State University and modified for Minnesota by Kent Olson, University of Minnesota. (www.extension.iastate.edu/AGDM/crops/al-80nratercalculator.xls). Using early January harvest price bids and input costs, corn-soybean rotation generates \$235/A returns to management; corn-corn-soybeans generates \$223/A; and continuous corn generates \$162/A. On our farm, we increased corn acres relative to soybeans last year, but will be planting relatively more soybeans in 2008. We will also be planting some spring wheat.

RISK MANAGEMENT

The second area on which I have been asked to speak is risk management. It is an intensely interesting area of management. It has been said that the less one knows, the more one says. That saying applies to risk management. It is an increasingly important management task for several reasons.

- the trend of tightening operating margins heightens the financial impact of unfavorable events
- the importance of international agricultural developments adds to uncertainty as we mesh more heavily into world commodity trade
- global warming increases the likelihood of extraordinary climatic events

The words “risk” and “uncertainty” are often used interchangeably. Let’s begin the conversation with some definitions. The American Heritage Dictionary defines “risk” as “the possibility of suffering harm or loss: the probability of such loss”. It defines “uncertainty” as “not known or established, not determined”.

To bring the concepts home, someone said: Buying a 40 year old Jaguar sports car, 2,000 miles from home, on eBay is a risk. Driving it home is an uncertainty. We will consider “risk”.

I will spend a few minutes on three aspects of risk. One aspect is risk analysis. Another is attitude toward risk. The third is categories of risk in crop production.

Incidence and Impact

Several years ago I heard an insurance analyst give a talk on risk management. He focused on two concepts of risk: incidence and impact. Incidence refers to the notion of the likelihood that something unfavorable will happen. Impact refers to the effect that the event will have on you or your business. Let’s discuss incidence in the context of crop yield.

Incidence:

Of course, we don’t know for certain what the future holds, but good management requires that we plan for it. Someone said: “Even if God Himself guaranteed farmers exactly what was going to happen, 90% would still wait to see if He was right”. This has been a widespread attitude, but it is changing. How do we assess “incidence”? We usually look into the future by exploring the past.

One way of exploring the past is memory. Societies not steeped in the Western scientific traditions rely heavily on memory. Memory is often relayed and heightened through stories and folklore. Until the advent of data collection and the science of analysis, memory was the only way of reconstructing the past to forecast the future. The point of it all is that memory, while not “scientific”, is a useful way of utilizing history to predict the future. Thereby, it is a tool to evaluate the likelihood of an unfavorable event to occur.

For those of us who like pictures, charts are a good way to assess crop yield risk. National, state, and county average yield data are compiled by USDA, NASS, and state statisticians. We keep a yield chart for our farm. I find it to be a very efficient way of gauging the likelihood of a crop yield shortfall.

Predictive mathematical models have been becoming more popular for prediction. Computers make it easy to fit equations to masses of data. They can provide quantification to produce precise probabilities of possible events. It can be useful to know that the probability of drought is, say, 10%, 40%, or 80%. However, unless one knows the assumptions, the model, and the database, one can be precisely wrong. To properly interpret a model’s utility, it is useful to know the confidence interval of the forecast. For example, suppose a model predicts a crop yield of 200 bu./A. If its confidence interval is 190 to 210, its utility for making decisions is different from one whose confidence is 100 to 300.

Impact:

Impact measures the consequences of suffering harm. It is easiest to consider short-term impact. That will vary substantially among farms. Consider, for example, an anticipated 200 bu./A corn crop. Priced at \$3.50/bu. it has \$700 gross revenue. If farm A has \$600/A costs the margin is \$100. If farm B has \$400 costs, the margin is \$300. Now, if the actual crop yield drops to 150 bu./A, farm A has a loss of \$75/A, while farm B has a gain of \$125/A. Farmer A should be more interested than farmer B in reducing risk. While one can generate many examples, the point is simple: the impact of harm is different from farm to farm, and it is critically important for managers to consider the impact when planning crops and strategies.

Long-term impacts are more difficult to manage. Some possible incidences are agricultural, such as developing resistant populations of weeds and pests to chemicals. We go to some lengths to provide “refuges” to maintain susceptible populations. We are urged to, and do, rotate herbicides. But we don’t know with a high

degree of certainty what the likelihood of some of their impacts will be. Hence, there is some tendency to ignore the possible impact. Other long-term events are beyond individual farm control and are also of uncertain consequence. These include possible environmental change with unknown impact on agriculture. They also include possible government regulations relating to air quality, water quality, greenhouse gases, habitat, and esthetics, all of which might have a big impact on the way we farm. In many of these areas we have little idea of what the impact will be. Unfortunately, we are short-changing necessary funding to analyze possible impacts.

Attitude:

Individual's attitude shapes the way they approach risk. Books and articles have been written on this subject. Many are in conjunction with marketing and investing management. But they also apply to overall risk management. Two University of Nebraska analysts have developed four categories of attitude. I have re-labeled their conclusions as: The Cautious, The Networkers, The Students, and The Dare Devils.

- The Cautious - they follow the rules
 - they are organized and want accuracy
 - they want to understand strategies
 - they want to avoid risk
- The Networkers – they are social, they volunteer, they become board members
 - they tend to act on a hunch
 - they like to know what other people are thinking, and doing
- The Students - they search for data and information
 - they are analytical
 - they are independent decision makers
- The Dare Devils - they like thrills
 - they are creative
 - they are quick thinkers
 - they are flexible
 - they see life as a game to be played

Risk Categories

For farmers, there are three categories of risk . They are: crop yield, crop inputs, and markets.

Yield:

Yield variability is huge in some parts of the country. In other it is relatively minor. I farm in a relatively low-risk area. Our crop yields are rather constant. Yet, there is yield variation which is significant in some years. A chart shows this quite clearly. Because of our soils, we tend to do better than county average in dry years, and less well in wet years. Coupled with climate data , these can be useful tool to plan for the next year's crop. We have not yet developed a formula to tie our yield variability to crop input planning, but would like to do so.

One of the ways to reduce yield risk appears to be with genetically engineered corn hybrids. Data from our nearby University of Minnesota Southern Research and Outreach Center shows that the multi-stacked corn hybrids tend to have lower yield variability as well as higher average yields. Especially in stress growing seasons, genetic resistance to pests appears to have benefits.

Inputs:

Crop input decisions also have a risk component. When I began farming, input selection was relatively simple. We had a choice of a few crop varieties relatively cheap fertilizer, and a couple of herbicides. University of Minnesota varietal trial data was a simple guideline for input selection. However, variety choices have multiplied, herbicide combinations and rates approach infinity, and fertilizer costs have zoomed. So how do we handle decisions?

Fortunately, we continue to have a good set of crop variety yield data from University Experiment Stations. We use Minnesota, Iowa, and Wisconsin data. This provides a wealth of data which is statistically reliable. We like to use three-year data from each site and assemble it into a spread sheet to aid comparisons. A great deal of other plot data arrives in the mailbox. We also look at yield data from our farm, but are skeptical about using it for the next year's variety selections. Essentially, we look to varieties with highest average yield and least variability.

In some respects, the advent of glyphosate tolerant corn and soybeans, herbicide selection has again become relatively simple. The great advantage of glyphosate is that it dependably works. There is almost no risk of

failure. Other herbicide programs can be quite effective, but are more variable, depending on soil moisture and climate. In the long run, there is rightful concern about developing populations of glyphosate resistance weed populations. We are mindful of it, watch for it, and use glyphosate combinations to address the danger.

There are several risks associated with fertilizer programs: cost, optimum rates, soil fertility maintenance, and environmental. I don't have a clue to how to manage cost risk. I'm always reluctant to buy any inputs when they are at record high prices, but it seems that every month a new record is set. So, it's frustration exemplified. We are trying to manage fertilizer more precisely. Best management practice (BMP) guidelines have been promulgated for several years. Initially, they were single-point numbers for nitrogen, phosphorus, and potassium rates. A team of scientists in the northern corn belt has developed a dynamic BMP tool for nitrogen. This guideline relates target rates to anticipated crop yield, crop price, and fertilizer cost. As such, it has become a very useful tool to optimize rate and to reduce risk of inappropriate rate. We have been fortunate to have been hosting a fertilizer project conducted by a University of Minnesota scientist, Dr. Gary Malzer. Optimum rates of one nutrient appear to be related to rates of other nutrients. We are also observing great differences in optimum rates, depending on apparent mineralization rate differences among soil types. This project has produced data which we someday may be able to tie to precision application technology. It will be useful if the project can continue.

Manure supplies a significant amount of the fertilizer in our crops program. Fifteen years ago we spread cattle manure where we could, as far from the feedlot as we could reasonably go. We pumped hog pits and aimed to incorporate at a high enough rate to supply ample nitrogen for a corn crop. We are now doing laboratory analysis on pit samples before pumping. We apply with a rate controller, and, of course, continue to incorporate with application. We then follow with supplemental nitrogen where necessary.

Environmental risks are looming ever larger in fertilizer decisions. Relationships between nitrogen, phosphorus and water quality have been of concern for some time. We are now seeing growing concern about fertilizer and greenhouse gas emissions. Our most immediate concern is with total maximum daily loads of nutrients in impaired watersheds (TMDL). As impaired waters are identified and TMDLs are established, we may see restrictions on rates and application methods for fertilizers. This could alter both timing and quantity of fertilizer application. Global warming has focused attention on greenhouse gases. This could affect fertilizer in a number of ways. Petroleum is both a base for fertilizer production and a means for fertilizer distribution. Sanctions on emissions could affect both. There is also concern about nitrogen emissions from soils to air. This could affect timing and rates. Finally, carbon sequestration possibilities for agriculture would affect tillage practices and thereby rates and application methods. Such risks could become opportunities, if properly handled.

Markets:

Marketing is a major area of farm risk management. Access to markets is one area of risk. In our case, we wouldn't think of growing vegetables or food grade soybeans without a contract market. Non GMO corn and low-linoleic soybeans are now commanding a price premium. Those premiums have been variable and may, or may not exist at harvest. Hence, delivery contracts reduce the price risk.

Commodity pricing is highly uncertain. There are two kinds of price risk. One risk is selling below production cost. The other is not selling in the upper range of seasonal price. For many years, corn and soybean price patterns in southern Minnesota were quite predictable. They were usually lowest at harvest and highest following river opening in the spring. Marketing consisted of putting the crop in storage at harvest, charting the market when the Mississippi river thawed, and selling when the chart began to turn down. That was usually in May. Westward rail movement of grain, ethanol plants, and huge investment fund participation in commodity markets have changed the market. Local area developments have changed basis relationships with futures markets. Fund involvement has changed futures market behavior. These have led to a change in strategies. We have now handed over about 20% of our pricing to professionals. We have separated delivery, basis fixing, and futures markets. We are now pricing over a three-year period. We do some options and futures trading, but generally don't find it useful to spend the time required to monitor these trades. We continue to pay careful attention to price charts. For those of us who like to look at pictures, these are a useful tool. I will offer a final comment about the risk of not selling in the upper end of the price range, even though costs may be covered at a lower price. Farming has become very competitive for resources. As we see the future, we need to grow the business size to provide adequate income for participants in the future. Part of this growth means adding land base. Competitors who sell crops at a higher price can offer the highest bid for available land. This doesn't mean that the economic environment is cut-throat. It does mean that we need to pay attention .

CONCLUDING POINTS

- The agricultural economy is good, overall
- Managing risk is a major component of good farm management
- Some risks are on-farm and can be managed within the business
- Other risks are off-farm , but must be part of the general level of management awareness