

Module 3

Financial Considerations in Managing Risks and Profits

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Introduction

It is probably impossible to avoid all risk in agriculture, but it is possible to manage risk while pursuing profits at the same time. Building a profitable risk management plan involves four major steps.

Step 1. Identify sources of risk. **Modules 1** and **2** discussed market forces and climatic changes and how they affect both price risk and production risk.

Step 2. Assess your own ability to bear risk. This lesson will illustrate several techniques for evaluating how much financial resiliency your business has when things don't turn out as planned.

Step 3. Think about your willingness to bear risk. Does uncertainty create mental stress for you? Are you more interested in keeping what you have than in accumulating more?

Step 4. Evaluate how different management strategies affect both profits and risk. Some strategies reduce the range of possible outcomes for both profits and losses. Others reduce the chances of a loss, only, in exchange for paying a fixed fee or premium.

The remainder of this lesson will focus on step 2, evaluating your financial ability to bear risk. Future lessons will discuss various production and marketing strategies and how they affect risk and profits.

Meeting Cash Flow Requirements (or go to [Topics](#))

In the long run you naturally would like to earn a profit over and above your total costs of production. This includes receiving a competitive rate of return on your investment and labor. If earnings consistently fall short of this, changes in production practices, resource acquisition, or enterprise choice need to be considered.

In the short run, though, simply meeting all cash flow commitments on time becomes the principal financial concern for most producers. Cash receipts from product sales and farm program payments are the primary sources of income for paying input bills, making loan payments, replacing depreciable assets, and meeting family living expenses and tax payments. If your cash receipts fall short of covering these anticipated expenditures, then you have to utilize other sources of cash such as savings, operating loans, outside income, or sales of assets.

To calculate your cash flow requirements, include the following expenditures:

1. operating inputs (seed, commercial fertilizer, pesticides, lime, soil tests, scouting, crop insurance, etc.)
2. machinery costs (fuel, lubrication, repairs, custom hire, machine rental, down payments on new or replacement items)
3. personnel costs (wages, salaries, other labor costs, family living expenses, income taxes)
4. land costs (real estate taxes, property upkeep, cash rent)
5. miscellaneous costs (farm insurance, consultant fees, tools, supplies, etc.)
6. debt payments (principal and interest on term loans, interest only on operating loans)

Divide the total of these expenditures by your total crop acres. Some expenditures, like miscellaneous costs, can be spread evenly across all crop acres. Others, like seed, will obviously be different for each crop. For purposes of marketing decisions it is not necessary to break costs down by field or farm, since grain from different locations will likely be commingled before it is sold. Be sure to include only the operator's share of input costs if they will be partially financed by a crop share landlord.

Now divide the cash flow requirements per acre by the anticipated yield (for preharvest pricing) or the actual yield (for harvest pricing) to determine the cash flow needed per bushel. Include only the operator's share of production under a crop share lease. This value can be used as a standard for pricing decisions. It is not necessarily a price goal. No doubt your goal is to receive as high a price as the market offers each year, or at least an above-average one. Your price goals will change from year to year or even week to week, depending on weather patterns and the combined effects of all the supply and demand factors affecting the market at that time. Some years, in fact, the market may not offer you a breakeven price at any point during the season.

Your cash flow breakeven price gives you a reference point that indicates whether extra cash will be available to use for other purposes or other sources of cash will have to be tapped to make up a shortfall. The financial management implications of either of these two possibilities are quite different.

Cash Flow Example (or go to [Topics](#))

Cash flow requirements can be very different for different producers. The amount of term debt being serviced and how land has been purchased or rented have the biggest impact. To illustrate this point, we will introduce you to four example farmers. Each of them produces 600 acres of cash grain annually, using similar technology on similar land. However, their land holding and debt situations differ considerably.

Oscar and Olga Owner. The Owners hold title to all the land they farm and are debt-free. Not surprisingly, they are in a high income tax bracket.

Richard and Rita Renter. The Renters cash rent their entire land base, and have some debt from purchasing machinery.

Cory and Chris Cropshare. The Cropshares have a 50-50 lease agreement with a great aunt on all their land, and also owe some debt on their machinery.

Bruce and Barbara Buyer. The Buyers recently purchased 250 acres of crop land and cash rent another 350 acres. They have the same machinery indebtedness as the Renters and the Cropshares.

All four families have calculated their cash flow requirements for one crop, corn. Their results are summarized below:

Item	Owners	Renters	Cropshares	Buyers
Seed, fertilizer, pesticides	\$110	\$110	\$55	\$110
Insurance, interest, misc.	20	27	15	30
Fuel and repairs	20	20	20	20
Drying	14	14	7	14
Custom hire and labor hire	10	10	10	10
Rent and real estate taxes	21	120	0	79
Fixed debt payments	0	11	11	64
Family living, income tax	69	56	57	50
Total cash flow needs	\$264	\$368	\$175	\$377

Although the example farms represent extreme cases, they illustrate how operations that are similar on the surface can have quite different cash flow needs. As we will see later on, this will cause them to take very different approaches to managing risk and pursuing profits.

Cash Flow Risk (or go to [Topics](#))

Operators who have low cash flow needs or substantial operating capital and borrowing capacity have more flexibility in how they market their commodities. Their marketing plan will be dictated mostly by expectations of price movements, storage costs, income tax

management, and storage space needs for the next crop. The degree of marketing flexibility that your own financial situation allows you can be measured by your cash flow risk ratio. It is calculated as follows:

$$\text{cash flow risk ratio} = (\text{cash flow breakeven price})/(\text{expected market price})$$

The cash flow breakeven price was explained previously. The expected market price can be simply the projected season average price as obtained from current outlook information, or it can be derived from localized futures prices, options trading, or forward contract prices. Future lessons will discuss in more detail how to use these other sources of market information for developing a marketing plan. In any case, the projected market price will change from year to year, which in turn changes your degree of risk from year to year.

The cash flow risk ratio tells you what percent of the crop must be sold at the expected market price to meet all your cash obligations. Once that is achieved, the remaining production can be marketed using methods intended to gain the highest possible net price, regardless of risk.

The higher your cash flow risk ratio, the more important it is to lock in a price at or above your breakeven price when it is available, and the less you can afford to speculate on the possibility of achieving a higher price. A cash flow risk ratio greater than 100 percent means it is possible that savings and/or borrowing will have to be used to meet your cash flow needs this year. On the other hand, a low cash flow risk ratio means you can pursue more risky marketing strategies. The cash flow risk ratio should be calculated for each of your major crops.

The table below shows the cash flow risk ratio for each of our example farmers when the expected market price for corn is \$2.67 per bushel. Note that the FAIR Act payments of \$44 per acre were subtracted from the total cash flow cost per acre to calculate the cash income needed from corn sales.

Cash Flow Risk Ratio for Corn				
Item	Owners	Renters	Cropshares	Buyers
Cash flow cost per acre	\$264	\$368	\$175	\$377
FAIR payment	-\$44	-\$44	-\$22	-\$44
Cash needed from sales	\$220	\$324	\$153	\$333
Expected or actual yield (bu.)	135	135	67.5	135
Cash cost breakeven price	\$1.63	\$2.40	\$2.27	\$2.47
Expected market price (\$/bu)	\$2.67	\$2.67	\$2.67	\$2.67
Cash flow risk ratio	61%	90%	85%	92%

Timing of Marketings (or go to [Topics](#))

Short-term cash flow needs also influence when products are marketed throughout the year. If you have major debt payments or other expenses due, you may have to make deliveries immediately even though prospects look good for prices to be higher later. Future lessons will

discuss how tools such as commodity options can be used to capture price improvement even after grain has been sold. Income tax management decisions can also affect the timing of sales, especially near the end of the tax year. Fortunately, methods are available to establish prices earlier while delaying receipt of the income into the next tax year or until major expenses arise. This reduces the risk of a loss due to a decline in prices while a commodity is being stored.

Marketing and cash flow decisions must often be made simultaneously. Moreover, some pricing alternatives such as futures and options contracts require cash to be paid out for premiums and placed in temporary margin accounts. For all these reasons the cash flow needs of your farm have a heavy influence on the choice and timing of marketing actions.

Tentative Calendar of Corn Deliveries						
	Oct-Nov	Dec-Jan	Feb-Mar	Apr-May	Jun-Jul	Aug-Sep
	----- Net Cash Flow from Operations -----					
Owners	-\$37,710	-\$6,810	-\$17,850	-\$79,410	-\$8,010	\$17,790
Renters	-\$70,440	-\$12,240	-\$45,600	-\$78,240	-\$6,840	\$18,960
Cropshares	-\$23,130	-\$12,330	-\$9,750	-\$45,330	-\$6,930	\$5,670
Buyers	-\$59,400	-\$11,700	-\$64,200	-\$77,700	-\$6,300	\$19,500
Estimated sale price	\$2.40	\$2.51	\$2.58	\$2.67	\$2.78	\$2.83
Bushels Needed to Deliver in Each Period (See Figure 1 for a graphical picture)						
	Oct-Nov	Dec-Jan	Feb-Mar	Apr-May	Jun-Jul	Aug-Sep
Owners	15,713	2,713	6,919	29,742	2,881	0
Renters	29,350	4,876	17,674	29,303	2,460	0
Cropshares	9,638	4,912	3,779	16,978	2,493	0
Buyers	24,750	4,661	24,884	29,101	2,266	0

Constructing a cash flow budget that covers the potential delivery period for your grain is the first step in developing a marketing calendar. Include all cash inflows excepts sales of the commodity or commodities in question. The months in which cash deficits are projected are months in which cash from the delivery of the commodities must be received, although the actual pricing may take place earlier. Divide the unmet cash flow needs in each time period by the expected selling price at that time to estimate the number of bushels that you will need to deliver that month or before. The table above shows these estimates for our four example farmers. Note that the expected market price is assumed to follow a normal upward trend during the marketing year. Some of this trend will be offset by storage costs, however.

Producers with an adequate line of operating credit have more flexibility in the timing of sales and deliveries. If market conditions are not favorable when cash is needed, borrowed funds can be used temporarily until grain is delivered. It is important to remember that although cash is usually not received until the product is actually delivered, there are many opportunities to set the selling price in advance. Methods for pricing prior to delivery will be discussed in detail in future lessons.

Contingency Plan (or go to [Topics](#))

Some years production disasters will leave you with too few bushels to pay all the bills. In other years the market conditions simply won't offer enough revenue, even to the best marketer. Realistic farmers know that these conditions will occur sooner or later—the only question is when, and how severe will they be. Although it is never pleasant to think about bad luck, many options are no longer available after the disaster has already occurred. For the farm business to survive, a financial contingency plan is needed.

The easiest contingency plan to implement is to draw on savings. Having money in passbook savings, short-term certificates of deposit, or liquid mutual funds provides a quick solution to cash shortfalls. Unfortunately, assets kept in a liquid form generally earn a lower rate of return. For this reason many farmers prefer to keep their capital invested in farm assets rather than financial assets. Those that can be easily turned into cash, such as stored grain or market livestock, are called current assets.

If cash and current assets aren't sufficient to meet short-term cash needs, you can use your reserve borrowing capacity to meet a shortfall. The size of your borrowing reserve will depend on your farm's total asset and liability structure, future cash flow commitments, and past credit history. Besides relying on institutional lenders, some operators look to other family members as a source of credit in an emergency.

A final component of your contingency plan is insurance. Not all adversities can be insured against, but grain producers at least have an array of crop insurance plans from which to choose. Some of them protect against production losses only, while others guarantee total revenue. Forward pricing tools can be used, also, to insure against declining market prices. Future lessons in this series will analyze these tools in detail.

The Liquidity Gap (or go to [Topics](#))

The prudent risk manager wants to know just how much borrowing capacity or insurance is needed. Having too large a cushion may limit profits in the long run. Higher insurance coverage in particular means paying higher premiums. One concept that can be used to measure the amount of financial risk a farm is facing is called the liquidity gap. This measures the gap between the cash income needed to meet all cash commitments, and the amount of cash that is readily available in the event of a crop failure or low prices.

First you need to estimate your farm's working capital. This is a common measure of financial risk that has been used by lenders for years. It is equal to the difference between the value of your farm's current assets and its current liabilities at the beginning of the production year. Current assets include cash or savings in easily accessible accounts, stored crops and feed, market livestock, and other assets that will be sold or used up in the next 12 months. Current liabilities include accounts payable, accrued interest, and short-term loans due during the next 12 months. The difference between the two represents the value of funds that could reasonably be available to meet cash flow commitments when crop revenue is not sufficient.

Traditionally the principal portion of intermediate and long-term debts due within 12 months has been included in current liabilities. However, if they were included in your calculation of

your cash flow requirements, it would be wrong to include them again. If you do include them in your estimate of working capital, then your estimate of your cash flow requirements should include only the interest to be paid on term loans, not the principal.

Now divide your working capital by the total number of crop acres. Subtract the result from your cash flow needs per acre to show how many dollars per acre are not protected. This is your liquidity gap, and most likely it will need to be filled some year. Various sources of liquidity can be tapped to fill this gap if needed. Some form of crop insurance is often the easiest and cheapest alternative.

The table below shows how the liquidity gap was calculated for each of our example farmers, for corn only. The liquidity gap should also be calculated for other major crops, and an average value for the entire farm computed.

The Liquidity Gap				
	Owners	Renters	Cropshares	Buyers
Current assets	\$203,550	\$203,550	\$104,275	\$203,550
Current liabilities	\$0	- \$47,000	- \$15,000	- \$79,000
Working capital	\$203,550	\$156,550	\$89,275	\$124,550
Crop acres	600	600	600	600
Working capital per acre ¹	\$339	\$261	\$149	\$208
Cash flow needed per acre ²	\$220	\$324	\$153	\$333
Liquidity gap per acre (loss)	(\$119)	\$63	\$4	\$125

^{1,2} These items are found in [Figure 2](#).

Protecting Equity (or go to [Topics](#))

Some fortunate operators, like Oscar and Olga Owner, have no liquidity gap. In fact, they have enough liquid assets to cover a total crop disaster and still have working capital left over. Their ability to bear risk is much greater than that of the other farmers. However, they may still prefer to limit the amount of loss they would have to suffer in any one year. For them, carrying insurance is a means of protecting their equity rather than guaranteeing cash flow.

If you are in the Owners' situation, how much net worth are you willing to risk? What is the most equity you would be willing to lose in one year? You may be tempted to answer "none!" That may be possible, but probably only if you lease your farm out for a fixed cash rent and let someone else take all the risks. Or, you could buy a zero deductible insurance policy with a very high premium. Realistically, being in business for yourself means you must take at least some financial risks.

Let's assume that all of the farmers in our example are willing to risk losing 10 percent of their net worth each year. They feel they could do this without substantially altering their businesses. The table below shows how many dollars that amounts to for each of them, for the whole farm and per crop acre. The last line is their net worth risk ratio, which is calculated as

follows:

net worth risk ratio = maximum \$ of net worth to risk/number of crop acres

Net Worth Risk Ratio				
	Owners	Renters	Cropshares	Buyers
Total farm assets	\$1,479,580	\$293,830	\$194,555	\$792,580
Total farm liabilities	\$0	\$149,795	\$52,045	\$529,463
Farm net worth	\$1,479,580	\$144,035	\$142,510	\$263,117
Net worth to risk (10%)	147,958	14,404	14,251	26,312
Number of crop acres	600	600	600	600
Net worth risk ratio	\$247	\$24	\$24	\$44

The Owners would be willing and able to risk losing nearly \$250 per acre, in return for a chance to earn larger profits in some years. Almost any insurance or marketing strategy would have a very small chance of incurring a loss this large. Therefore, maximizing long-run profits or perhaps increasing their chances of earning a large windfall will guide their choices. The other families will have fewer choices, however. They must choose from among those strategies that minimize the chances of even a relatively small loss.

Future lessons will show how to estimate for different strategies the probability of losing more than your individual net worth risk ratio. They will also show the probabilities for realizing higher than average profits, or even a real windfall. As a risk manager you must weigh the odds of earning these profits against your need or desire to avoid financial losses.

Key Questions for Your Farming Operation (or go to [Topics](#))

Before you go on, answer the following key questions for your own farming operation:

1. What is your cash flow breakeven per acre for one or two major crops?
2. What is your cash flow risk ratio for each crop?
3. How much is your working capital?
4. What is your liquidity gap for each crop?
5. How much is your net worth risk ratio?

Reference Material for this Module

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