Farm Profit-Maximization in Western Canada:

Process, Pricing and Planning in the Marketing of Commodity Crops

By

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A Thesis

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In Partial Fulfillment of the Requirements
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Abstract

Ideally, a farmer would sell all of his or her crops when the market is believed to be peaking, at a price representing a profit to the farm. In practice, there are constraints to doing so including the fundamental challenges of choosing the most profitable crops and predicting the direction and magnitude of price changes.

This study builds on the knowledge base of 'what farmers are doing' when they market their crops, and develops a planning framework that can act as a bridge between the farm and the next-use markets in western Canada. The research into farmer marketing behaviour has revealed that sales activities are driven both from the need for the farm to sell to generate movement or revenues, i.e. the 'push' from within, and by sell signals and pricing opportunities, i.e. the 'pulls' for crops to be sold off farms that come from the marketplace.

To frame the specific situation Prairie farmers face as they approach the marketplace, the study begins with a review of the commodity crop pricing systems currently in use, the industrial change that has taken place in the grain handling industry recent years, and how these impact farmers' position in the marketplace. To clarify the focus of this research and to set the stage for the commodity-specific and farm-level analysis of marketing activities that follows, the theory of farmer utility through profit maximization is then developed, with a model that acknowledges the influence of non-monetary factors in farmers' decision-making process, and the market imperfections they face in

attempting to analyze prices and decide when, where and how to sell the various crops. Finally, a framework is offered for building and executing a marketing plan that takes into account the internal, farm-specific realities of marketing to maintain the crops' quality and pay the bills, and the external market information farmers have access to in attempting to capitalize on trends and variability in the prices.

This research has uncovered a number of improvements to the marketing process that farmers might profit from. Selling for internal farm-related reasons rather than in response to market signals is not ideal, nor is marketing to maximize revenues rather than the profitability potential of the individual farm. Hedging, pooling or any other standard risk management mechanism will not work in isolation for a typical farmer that has diversified into crops that trade in differently-structured markets. Farmers must realize that they alone bear the risk of farm failure and that their 'partners' in the supply chain are not always positioned to operate in their best interest. For these reasons and others related to personality and individual risk tolerance, only a unique marketing plan devised and controlled by farm managers themselves, will work to optimize marketing decisions and maximize profit potential. The grain industry on the whole, farmers as well all other interested parties, could also benefit from clarifying the goals and dialogue surrounding marketing systems in this respect.

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Chapter 1: Introduction

The question of which structure western Canadian farms should use to market commodity crops has been studied in various contexts, with researchers coming to differing conclusions about the state of the Prairie grain industry and how it should be changed or maintained. As "agricultural trade and trade policy occupy a special niche in the discussion and analysis of economic issues" (Houck, 1986), efforts to fairly assess and improve marketing systems in the midst of cultural, political and emotional matters at play throughout the stages of the supply chain for Prairie crops is a complicated matter. Farmers themselves have adapted their operations and attitudes as best as they can in reaction to major structural changes in the industry at home, and challenges to their profitability from competing grain producers around the world, but marketing remains a confusing and cumbersome job.

The purpose of this research is to assess commodity crop sales planning and marketing at the farm level. In so doing, the line between policy and marketing may appear to be crossed, because the two are so closely intertwined in the grain industry in western Canada. But the approach taken here is simply different than past attempts to offer one standard risk management or marketing framework to producers, such as price pooling or hedging via futures, which may not encompass enough information for an individual farm to maximize profit.

One single approach will not work for the producer attempting to maximize revenues from multiple types of crops. In addition to changed positioning of farmers vis-à-vis the

major types of buyers of Prairie crops, which will be discussed in Chapter 2, the need to improve upon farmer crop marketing strategies and implementation stems from the shift in the production mix that has taken place in past decades, as shown in Table 1.1 below.

With the growth in interest in pulses and special crops, for example, the portion of the total acreage base without a corresponding futures market grew from 10% of the total cropping mix in 1975 to 23.4% thirty years later. The portion of crops tied to futures has never surpassed 40%, yet agricultural marketing texts have focused almost exclusively on hedging for price risk management. The historic reliance of western Canadian farmers on the Canadian Wheat Board (CWB) for marketing has declined most significantly in recent decades, from almost three-quarters of crops in 1975 (or more than 75% including oats) to just 38% in 2005. The table does not include alfalfa and forage grasses, which fall outside the scope of this analysis of pricing systems for crops marketed commercially, but hay and pasture production has also been taking away from the acres seeded to Board grains. Today, significantly more and different pricing and risk management alternatives have developed within the CWB system which also must be considered in farmer marketing decisions and further changes to the marketing authority appear likely in the years to come.

Table 1.1: Breakdown of Crop Area by Market Structure, 1975, 1995 and 2005

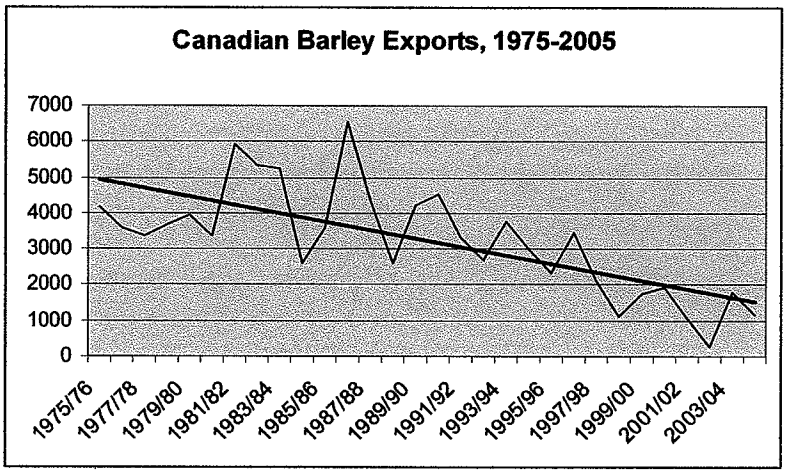
Seeded Area of Crops in Western Canada (Manitoba, Saskatchewan and Alberta)						
000s hectares	2005	% Total	1995	% Total	1975	% Total
Crops With Futures	Area	Cropped Area	Area	Cropped Area	Area	Cropped Area
Barley	4,162	16.57%	4,338	17.57%	4,209	13.19%
Canola	5,457	21.72%	5,310	21.51%	1,720	5.39%
Total With Futures	9,619	38.29%	9,648	39.08%	5,929	18.57%
Crops With No Futures						
Oats	1,670	6.65%	1,427	5.78%	1,882	5.90%
Fall rye	142	0.57%	146	0.59%	294	0.92%
Flaxseed	842	3.35%	876	3.55%	567	1.77%
Mixed grains	132	0.53%	140	0.57%	314	0.98%
Dry peas	1,366	5.44%	819	3.32%	30	0.09%
Total Beans	112	0.45%	38	0.15%	-	0.00%
Mustard seed	212	0.84%	267	1.08%	66	0.21%
Chickpeas	79	0.31%	0	0.00%	n/a	n/a
Triticale	54	0.21%	23	0.09%	n/a	n/a
Canary Seed	190	0.76%	148	0.60%	n/a	n/a
Grain Corn	59	0.23%	20	0.08%	5	0.02%
Soybeans	45	0.18%	0	0.00%	n/a	n/a
Lentils	884	3.52%	334	1.35%	n/a	n/a
Sunflower Seed	93	0.37%	49	0.20%	25	0.08%
Buckwheat	4	0.02%	12	0.05%	10	0.03%
Total No Futures	5,884	23.42%	4,299	17.42%	3,192	10.00%
Board Grains						
Wheat	9,620	38.29%	10,738	43.50%	22,800	71.43%
Total Cropped Area	**25,123**		**24,685**		**31,921**	
Summerfallow	4,087	16.27%	6,779	27.46%	11,210	35.12%

Source: Statistics Canada

Note that in Table 1.1, the 'Board grains' category includes wheat only, and it shows all of the wheat, even though the CWB markets some barley and not all of the feed wheat grown in any given year. This loose categorization was chosen for this research because the portion varies from year to year according to market conditions, rotational considerations and the weather, and because precise estimates are not needed to make the point that significant changes have taken place in recent years. Thus, the portion of the wheat crop that isn't marketed by the CWB is assumed to be about the same as the amount of barley they do market, which likely over-states the handling volumes of the

CWB, especially considering the increasing number of 'feed' wheat applications in the domestic market such as ethanol and the decline over time in feed barley exports as illustrated in Chart 1.1 below. Also because there is a viable Winnipeg Commodity Exchange (WCE) feed barley contract used to value the majority of the barley crop, it is included in the category of a crop that trades against futures.

Chart 1.1: Canadian Wheat Board Exports of Barley, thousands of tonnes, 1975-2005



Source: Canada Grains Council

In short, the world of marketing used to be a simpler place for commodity crop farmers on the Prairies. The percent pooled is down significantly in the last 30 years, prices are volatile over time and widely variable over space. Financial risk cannot be managed with a single approach to risk management, or a one-size-fits-all marketing strategy. The co-operative infrastructure that used to characterize the grain handling industry has been restructured and consolidated, which has changed the face of buyers in the marketplace and the mechanisms used to confer price signals. Farmers understand more about the

markets than ever before in history, but challenges remain in responding to market signals, and identifying and managing the farm's needs and goals. This study will assert that every farm is a unique organization in need of its own proprietary marketing strategy to achieve maximum profits. It also highlights the challenges and market imperfections that farmers face as they approach the markets, and establishes the theories of market efficiency and farmer profit maximization in the context of commodity crop marketing.

The first part of this study will frame farmers' position in the marketplace following two decades of industrial changes in the grain handling industry, which collectively makes up the majority of the next-use market for Prairie crops. The literature on farmer marketing decisions and the changing structures in place in western Canada are then reviewed. Next, the theory of farmer profit-maximization through marketing will be developed. It will be shown how this process takes place in a multi-structural environment fraught with inefficiencies, politics, philosophy and emotion, which makes tracking progress a major undertaking, and measuring success highly subjective. For this reason, the pricing structures and risk-management tools for each type of crop are assessed in detail, according to each market's method of signaling good pricing opportunities and marketing pitfalls.

Following this analysis of how the three main types of Prairie crops trade, a farm marketing plan framework will be developed with the goal to act as a bridge between two different worlds: a farm's specific marketing potential, constraints, needs and goals, and the outside world that sends signals through market pricing to which producers must

respond. The ability to calculate all variables that affect profitability and then to plan sales around them in a realistic manner is expected to increase the likelihood of maintaining a profitable farm business. This hypothesis is not tested here in the traditional fashion with estimated relationships and t-statistics. Instead, this research responds to gaps identified in the literature by providing 'real-world knowledge on what farmers are doing' in their marketing.

It is hoped that by identifying the variables in the marketing decision-making process at the farm level, and the challenges of successfully selling within the various structures of their crops markets, readers will gain a better understanding what farmers might do to increase their chances of success. While there may be many causes of declining farm incomes and farm numbers, most relate to changes in the profitability equation, i.e. revenues less costs in a financial sense, and do not account for the non-monetary variables that influence success and require consideration in the marketing planning process. While difficult to measure, a key contribution of this research will be the acknowledgement and assessment of factors such as a farmer's own emotional and financial tolerance for price risk; the degree to which they may or may not be price-takers; their short and long-term goals; business and political affiliations and other factors. That these are never isolated from the day-to-day crop selling decisions suggests that a farmer will only be satisfied in his or her marketing efforts by crafting a unique approach.

Chapter 2: Industry Framework

As a result of structural changes in the grain industry, farmers today have more production choices, and the industry into which they sell is more complex. The issues discussed here define pricing systems and the roles of the various players as they pertain to a farmer's crops and their next-use markets.

'Lack of transparency' is the term that will be used to describe difficulty farmers have in gauging the value of their crops, and the cost of services provided by secondary grain handlers and other intermediaries. As will be shown, all prices at the farmgate level incorporate similar cost components to move that crop to its next or end-use market, the value in which also varies depending on the buyer. Choosing who to sell to, and how, at the farmer level of the value chain thus depends on a number of both cost and value-related factors that can be difficult to discern for a number of reasons:

- There is not readily accessible information on many of the price components;
- The practice of dissecting prices and assessing the value of each component relative to its cost, and comparing between buyers, is not common in the western Canadian farm community;
- Farmers' participation in the markets is less intense and sporadic as compared to the parties they are selling to, who are regularly comparing and contrasting the valuation and cost components of crops' prices;
- Farmers' traditional role as price-takers may make the work to understand where the prices for their crops are coming from seem less worthwhile.

Opinions will differ on how well a farmer could integrate information on the origination of prices, the cost components that are deducted, and the value signals of end users, into their marketing planning and use it to their success. Others will argue that it is not in the best interests of the industry overall for high-level pricing to be publicly available, compared and discussed. The companies and organizations that charge farmers for services related to marketing, elevating and transporting grain should prefer the information to be more transparent rather than less if they have found the highest value market and their costs are competitive and fair, but at the same time it is recognized that confidentiality is considered a negotiating asset in certain circumstances.

For the purpose of this analysis, improving price transparency at the farm level is considered important to gaining control over the commodity crop marketing process, and improving the quality of ongoing decisions – for an individual producer. Being able to track prices back from the transaction between the intermediary handler/marketer and the end user to the farmgate bid not only introduces the ability to compare costs and services between different types of local marketing outlets, it also transfers information about willingness-to-pay for attributes related to the time, place and form value of the crop. The more accurate that information is, the more responsive farmers can be in planning what types of crops to grow and how to treat them to maximize their value in the marketplace, as well as when and how to sell them.

A closely-related issue to transparency in pricing is the high degree of variability in prices among buyers, for the same crop in the same condition in the same basic region on the same day. When there is a range of $1/bu, accounting for 30% of the crop's price, it is impossible to say what the value of the crop is. In addition, it causes confusion and difficulty in marketing, and can breed distrust and uncertainty in farmers as they interact with various buyers. Further details on how this variability and the valuation information affects the farmer marketing decision-making process, as it relates to profitability, is provided in the analysis contained in Chapter 5 along with specific examples for western Canadian grain markets.

The price discovery information compiled in this research study is intended to enhance farmer's understanding of the processes that determine farm crop sales revenue streams. The analysis is replicated for the three main types of market structures: crops that trade against Winnipeg Commodity Exchange (WCE) futures contracts, crops with no corresponding futures market, and crops marketed by the Canadian Wheat Board (CWB). Following that, the shifts in the makeup of the domestic crop buying industry are explained, in the context of regulation, elevator ownership, rationalization and corporate consolidation. Although the philosophical and political issues associated with each crop sector and pricing system will be perceived differently by each individual farmer across Manitoba, Saskatchewan and Alberta, all have access to the same basic mix of pricing mechanisms and buyer types and as such the trends described below can be considered to affect the Prairie commodity crop farm business framework consistently across the region of interest.

2.1 Price Discovery

The ability of futures and options risk management tools to help western Canadian farmers is clearly limited by the fact that few crops trade against one that is wholly relevant to local cash prices. Crops that trade against liquid, functioning Winnipeg Commodity Exchange (WCE) futures contracts are arguably the more price-transparent, because the futures market pricing mechanism tends to fit the definition of efficient (discussed in more detail in Chapter below). By absorbing the buying and selling interest of all interested parties, the futures price at any point in time nets out a timely and accurate reflection of the underlying value of the commodity. Prices will sometimes overshoot (or undershoot) their equilibrium level, especially in the presence of large speculators, but in general, through arbitrage and convergence it is still safe to assume that in a liquid, functioning futures markets such as canola, the portion of the crop's value that is the futures price is transparent, random and unbiased against buyers and sellers. The futures side of the local cash price accounts for upwards of 90-95% of the value of canola (assuming a 'normal' basis of -$25 per tonne and $350/tonne futures).

Although it varies over time and place among companies, the basis portion of the price is also largely made up of tractable, transparent and relatively stable factors. Consider Illustration 2.1 below, based on the export market, published annually by the Canada Grains Council in its Statistical Handbook.

Illustration 2.1: Canola Basis and Cash Price Calculation Example, into an elevator in central Saskatchewan in May, 2005

Assume the elevator company is charging the maximum tariff registered with the Canadian Grain Commission, the interest rate is 4.5% and it will take 60 days for the elevator to move the canola to export position. The grain will be stored in the elevator for 30 days and in terminal position for 10 days.

Futures Price	July Canola	$280.00
	Export Basis (instore Vancouver)	32.00
	Cash Price (instore Vancouver)	312.00
Basis Calculation		
	Elevation	$(8.00)
	Freight	(38.00)
	Primary Storage (30 days @ .08)	(2.40)
	Terminal Storage (10 days @ .068)	(0.68)
	Terminal Cleaning	(5.75)
	Interest (60 days at 4.5%)	(3.28)
	Total Deductions	(58.11)
Cash Price in Saskatoon		$253.89
Basis		(26.11)

Source: Canada Grains Council

Few components of the basis vary significantly over time. The total of all deductions is relatively stable, and more importantly, traceable. A farmer who doesn't believe the basis is correct can determine if the transportation, storage, interest, and quality discounts are in line with industry standards by checking with the railways or trucking companies, futures market specifications, banks, and the Canadian Grain Commission. The basis in the next-use market, here the export basis, varies because it values the crop in Canada relative to import market demand, but because it is actively traded by grain companies, importers and others, brokers know this price at all times and share it with market participants in the course of their work, as well as publish it in market newsletters along with next-use basis levels for other commodities.

The basis for feed barley is also widely quoted, and calculated similarly to the above canola export basis, by subtracting off the price in Lethbridge (the main domestic consumptive base and futures delivery point) the same basic cost components to move it there from points across the rest of the region. Thus, if the basis in Lethbridge was $5/tonne under, a broker that charged $2/t for his marketing service, who could book trucking from Regina to Lethbridge at $22/t, might bid an on-farm pickup basis in the Regina area of $29/t under.

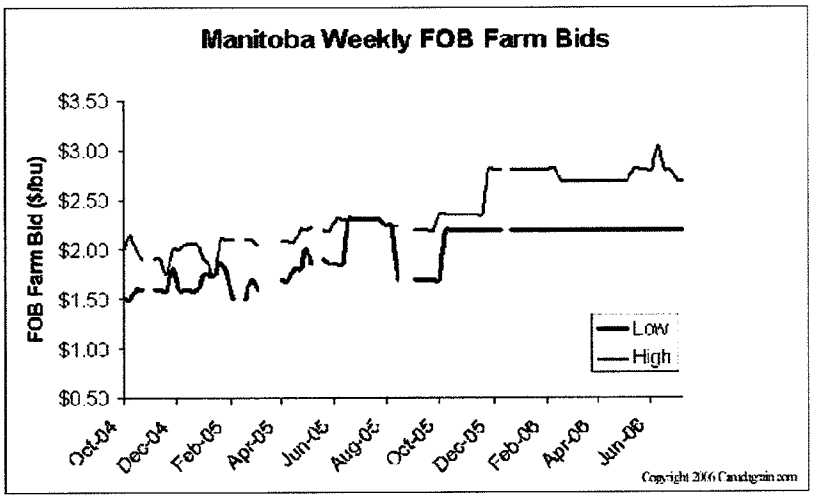
Crushers, feed mills and other domestic processors face an altogether different set of factors in developing daily bids; namely, the value of the goods produced from the raw product, in their end-use markets, less operations costs. For example, the value of canola seed to a canola crusher is technically the weighted average of the price of canola oil and meal according to the yield of each from the crushed seed, less processing costs. But with Canada an important world exporter of canola, the export basis tends can have a stronger impact on country bids. In times of surplus supplies over domestic processing capacity, crushers only need to pay $1/tonne better than the export basis backed off in order to source canola seed into their plants (i.e. buy it away from the export market). In times of shortage and negative crush margins, domestic processors have to pay a premium over what the canola may really be worth to them in order to keep their plants running.

In both the canola and feed wheat examples, the basis in the next-use market is the starting point for the bid calculation in the farmer's local area. Confusion in basis pricing can arise from the difference between this approach and the calculation of basis as the

difference between the cash and futures price. In theory, the cash price in the region where the contract can be delivered upon should be the same as the futures price in the delivery month or different only by the costs associated with delivery against futures. Otherwise, there would be an arbitrage opportunity that commercial players could quickly profit from. For canola, which is deliverable in the Saskatoon region and feed barley, for which the WCE futures contract specifies the Lethbridge area as deliverable at par, this theory holds and convergence is observed often enough to consider the contracts as viable and efficient.

In the case of WCE feed wheat, oats and others tied to U.S. futures markets, the relationship does not hold due to issues related to liquidity, and place and form differences between the Prairie cash market and the futures contract it might be associated with. To illustrate, the feed wheat high and low cash prices in Chart 2.1 below were compiled by Canadagrain to show the extreme nature of the cash market variability that farmers in western Canada face. In Manitoba, the variability in bids can range from 50 cents/bu to over $1/bu during a given week, even while futures prices are stable. This lack of transparency essentially clouds value signals, hindering planning and marketing efforts and creating additional work to obtain the highest possible price when the producer needs to sell.

Chart 2.1: Cash Price Variability in Farm-Level Pricing, feed wheat in Manitoba



Source: Branscombe Consulting and Canadagrain

For this reason, prices in feed wheat and other non-converging futures-traded markets are discovered more like prices of crops that don't trade against a futures contract. Pricing in this manner is less transparent than futures pricing for three key reasons. First, these crops' next-use markets are not generally active, liquid or transparent themselves. With few market participants trading smaller volumes into spottier marketing opportunities, it becomes more difficult to obtain information and there is less sharing of it amongst market participants. At the local level, this can be seen in the relatively fewer market newsletter services that cover pulses and special crops relative to canola and feedgrains.

Working on their own, it is difficult for Prairie farmers to find the asking price of yellow peas delivered to a port in India, and to be confident in the accuracy of that price. Furthermore from that level it is the full asking price in the destination market that is backed off to a buyer/handler in western Canada, rather than the approximately 5-20% of

the price that is the basis, which leaves more room for variability and unjust fluctuations from 'normal' costs to make their way into the bid to the farmer. The components in the backoff of prices for crops that don't trade against futures can be more difficult to verify than the costs factored into a domestic basis against the WCE. For example, the ocean freight and insurance costs incorporated into the pea backoff calculation shown in Table 2.1 would not be easy for a trader to find a representative value for, let alone a farmer.

Table 2.1: Sample Price Calculation for Crops With No Futures Market

Yellow Edible Peas Delivered to India	
$US/tonne delivered CIF India	$225.00
Ocean Freight	$70.00
Insurance	$4.00
FOB Vancouver Equivalent Price	$151.00
$CDN/t ($0.88 US exchange)	$171.59
Terminal transfer	$7.50
Rail from interior	$30.00
Elevator handle/risk/insurance/interest	$15.00
Net interior bid per tonne	$119.09
Net interior bid per bushel	$3.24

Source: Kostal Ag Consulting

Crops that are marketed through the CWB are also partially determined by the same basic calculation of subtracting the sum total of costs to move a crop from the interior to the next-use market. In this case, the next-use market for a farmer in the countryside refers to the common price referencing point 'instore Vancouver or the St. Lawrence'. The payment actually made to a farm is the relevant instore price less the costs incurred to move it there, either by the grain company the farmer delivers to, or in shipping a producer car, the total of which is commonly referred to as the CWB 'deductions'.

There are a variety of instore values a producer may choose through the CWB, including the pooled price and four distinct alternative pricing options. The "Producer Payment Options" (PPOs) were first introduced in 2001/02, and have continued to evolve and expand in each year since. Using the PPO's still involves selling through the CWB, but there is more flexibility, risk and opportunity in pricing and payment terms.

Currently, the following five basic options are available for pricing CWB wheat.

1. Price pooling in the traditional manner, the value of which is estimated each month in the Pool Return Outlook (PRO) price forecast;
2. Price pooling with an Early Payment Option (EPO), which allows a grower to fix a minimum price as a percentage of the current PRO, for a cost that changes daily;
3. Cash pricing via the Fixed Price Contract (FPC), which removes the grower from the pools when he or she chooses instead a cash price made up of the U.S. wheat futures closing price at the day's Canadian dollar exchange rate and a CWB Basis;
4. Cash pricing via the Basis Contract, which is the same as the FPC but allows fixing the Basis and the futures portions separately;
5. Cash pricing via the Daily Price Contract, the value of which is meant to reflect U.S. elevator prices.

The optimal contracting option to use at any particular time will depend on many factors specific to an individual farm such as its cash flow situation, mix of crops in the field and/or in inventory, personal preferences and current market conditions. In general, the

point of moving away from traditional pooling is to increase payment flexibility and improve cash flow, and to offer farmers an opportunity to capture a higher price than the pool returns. To illustrate how this comes through to farmer decision-makers, further detail on each of the pricing options is provided below, beginning with dividing the above-listed contracts into two basic categories:

1. Pooling options, which includes traditional pooling and the Early Payment Option; and
2. Cash pricing options, which refer to the Fixed Price, Basis and Daily Price Contracts.

Opting crops out of the pool involves signing an FPC, DPC or Basis contract before a set deadline. Staying in the pool requires doing nothing out of the ordinary; fixing a minimum portion of the projected return involves a cost and EPO contract commitment. The other intricacies involved in positioning a farm to maximize profits given the various pricing tools offered by the CWB, and managing risks and rewards, are detailed for each contract below.

Price Pooling: Price pooling is the traditional method for marketing Board grains. The main advantage of pooling over the CWB's other pricing options is that it is easy. Because farmers have always done it, there is no learning involved with continuing to market Board grains through the pool, whereas the alternative contracting options offered require some research, analysis and forecasting to use to the farm's advantage.

Sales revenues from all spring and durum wheat and barley offered to the CWB are averaged out, resulting in a similar per-tonne price being paid to all farmers who participate. Pooling as with all CWB pricing, is done on an instore Vancouver or the St. Lawrence basis, meaning an individual farm's exact payment will depend on transportation to the local point where delivery is made, and the handling charges of the company the farmer chooses to deliver to. When a farmer delivers wheat intending to market it through the pools, the initial payment is made upon delivery. Adjustment and final payments over and above the initial are mailed directly to growers, as they are issued.

The Pool Return Outlook (PRO) is the CWB's best guess at what grain marketed through the pool accounts will be worth at the end of the year. It is essentially a long-term forecast of the final payment, taking into account sales already made, the CWB's expectations about futures, world basis and currency levels.

The current month's PRO can be used for planning purposes, but it is only a forecast value of final returns and not a guarantee, and it is liable to change from one month to the next. Short term variation in the PRO tends to be minimal, but over the course of the year the PRO's can fluctuate significantly, impacting the profitability of an individual farm accordingly. This uncertainty is the main disadvantage of traditional pooling, and relates to the issue of non-transparency. The final payment may or may not be an exact calculation of the net weighted average selling price for the crop less the corresponding

costs, and it is not known with certainty until about two years after farmers start making planting decisions based on the relative profitability of different crop options. Not knowing the crop's value and exactly when delivery/payment will be made also makes it harder to plan the farm's overall cash flow for the year ahead.

Pooling also comes with a significant cash flow disadvantage. Farmers are required to finance the difference between the initial and final payment on what has been delivered, and the full value of what hasn't yet been called for, at a cost that will depend on the variety of crop in question, the producer's interest rate and other factors unique to the farm. Because payment terms are the key difference between the various CWB pricing options (delivery remains separate), calculating this cost is a useful step in deciding whether to stay in the pool or choose one of the alternatives described below (see Illustration 5.4 in the analysis section of this report for more detail).

The Early Payment Option: In taking out an Early Payment Option contract, the farm's wheat still remains in the pool. But, the contract allows 'early payment' of the future value of the pooled price, for a cost. In other words, the EPO allows growers to lock in a minimum price based on the current PRO, which is calculated as 80, 90 or 100% less a discount, which fluctuates. Thus, the goal in utilizing the EPO contract is twofold: to price it against the highest possible PRO price forecast, at the lowest possible discount.

For example, suppose the current month's PRO for No. 1 CWRS 13.5% protein wheat was $204/tonne instore Vancouver or the St. Lawrence. During that same month, a

grower decided to take out a 90% EPO on a day when the posted discount, or cost of the contract, was $4.50/tonne. Effectively he or she would lock in a minimum price of ($204*.90)-4.50 = $179.10/tonne less deductions to the local delivery point. The initial payment would be made upon delivery of this wheat. A payment equaling the difference between the initial payment and the minimum price that was locked in is mailed within two weeks.

Then, any further adjustment or final payments that take pooled returns above the minimum price of $179.10/tonne would also be issued to the grower. In the end, the maximum cost of this option to a grower, over and above simple pooling, is the option price itself, i.e. the discount charged. By staying in the pool, a farmer remains open to take advantage of further pool payments, while eliminating the risk of the final payment ending up much lower than the current PRO. This risk management aspect of the EPO is its main attraction.

By contrast, the cost of the EPO and the timing of signing the contract can be major downfalls. If the discount is too high at the time the grower locks in the EPO, the adjustment and final payments will also need to be high in order to trigger a payment over and above the minimum price locked in. Early on in the marketing year, the cost of the EPO tends to be high due to the uncertainty related to the final outcome of the pooled price, and the time value of the early payment. Depending on the PRO, discount charged and level of the initial payment, the top-up can be fairly minor; in fact, in this contract's infancy there were cases where the minimum price available under an EPO option, which

the producer would have to pay a non-refundable fee for, was less than the initial payment, which everyone receives automatically upon delivery.

It is interesting to note that in addition to the cash flow advantage, the value of which can be measured by a particular farm by comparing its interest cost to a current day's EPO cost, the EPO offers much the same downside price risk protection as options on futures contracts. The discount or cost of an EPO goes up the higher the percentage of the PRO that is being locked in, i.e. the closer it is to being in-the-money. At the same time, the discounts tend to drop over the course of the marketing year, as the PRO's become more certain, and the 'time value' of the EPO drops.

The Fixed Price Contract (FPC): The Fixed Price Contract allows growers to remove a specified tonnage from the pooled payment system and instead returns a final settlement price chosen on a particular day. As with pooling, the initial payment is paid upon delivery of wheat to an elevator or processor, but unlike pooling a top-up to the cash price specified on the FPC contract is made within the following 2 weeks. The FPC limits downside price risk similarly to the EPO, but there is no posted cost or discount associated with it, and after it is fixed no further adjustments or final payments from the pool will be issued.

However, the FPC is tied to the PRO, which is an important distinction between it and a cash price for a privately-traded crop. When the first new-crop Fixed Price and Basis bids are released, the FPC is set at about the same price as the current Pool Return Outlook,

which makes sense intuitively because the bids available under the FPC represent the price at which the CWB is willing to pay farmers on any given day and the PRO is the CWB's best guess as to that wheat's value. After that time, wheat futures and Canada-U.S. dollar exchange rate, coupled with the Basis, determine the exact FPC available on any given day.

A common rule-of-thumb regarding use of the Fixed Price Contract is to price grain against it instead of the pool when the FPC bid is above the current PRO, or below it by less than the farm's interest cost of pooling. This can be interpreted as a signal that the cash price available will be worth more to the farm than what the CWB expects to pay via the pool accounts. However the uncertainty in the PRO creates a risk in using this approach related to the possibility it will end up higher than the FPC price locked in and the current PRO at the time the decision was made.

The CWB Basis Contract: The CWB Basis Contract is not comparable to a non-Board, privately traded basis as shown above, except insofar as it accounts for the difference between the U.S. futures price (converted to Canadian dollars) and the FPC, a cash price. The CWB Basis is not arrived at in the same way noted above that the various buyers arrive at their 'basis' or back off prices from a next-use market, because neither the FPC nor any other PPO incorporates an actual daily market price the wheat in question was sold at into a next-use or end-use market. The CWB deductions subtracted from the instore PPO or pooled return more closely resemble the basis or backoff process used in non-Board markets.

How the Basis is calculated remains largely confidential, but a few insights can be gained from observing past patterns. As mentioned above, in most years when the new-crop Fixed Price and Basis bids come available, the FPC is set at about the same price as the current Pool Return Outlook. After that, the main impact on the Fixed Price bid is the U.S. futures market value a particular grade of wheat is tied to. The Basis is adjusted when the Fixed Price bid gets too far out of line with the PRO, due to a major change in the futures market, in order to limit the incentive for growers to jump in and out of the pool accounts.

The CWB Basis is also reviewed each time a new Pool Return Outlook (PRO) price forecast is released, which also infers the main purpose of the Basis is to keep the PRO and FPC line. Information independently related to the wheat basis for Canadian and competing-origin wheat isn't necessarily factored into the calculation, nor does the basis always change in response to typical market forces.

Another important factor to monitor in using a CWB Basis Contract, or a basis contract for any crop priced off a U.S. futures market, is the exchange rate. As the exchange rate falls, the Canadian-dollar equivalent futures price, which is added to the basis to determine the net price paid, rises, in a direct relationship. By calculating the futures price that is applied to a growers' Basis Contract at the exchange rate on the day the contract is priced, the CWB sheds any exchange rate risk associated with the contract and places it with the contract holder. A rising Canadian dollar thus reduces the value of

pricing an open CWB Basis Contract and vice versa. In certain non-Board markets, such as Ontario wheat, corn and soybeans, western Canadian milling oats and Manitoba corn and soybeans, most buyers quote a 'U.S.' basis, which carries with it the exchange rate risk rather than leaving it with the seller. In these cases, the price assigned in fixing an open basis contract is the closing futures price on the day, as though it were in Canadian dollars.

The Basis for each class of wheat marketed through the CWB corresponds to the market for U.S. wheat that most closely resembles it. CWRS, Hard White (CWHW) and Extra Strong (CWES) wheat are priced against the Minneapolis futures market, Soft White Spring wheat (CWSWS) is tied to Chicago wheat futures, while winter wheat, CPS Red and White are priced against the Kansas City futures.

Daily Price Contract: The Daily Price Contract (DPC) is very similar to the Fixed Price Contract, from a producer risk management standpoint. Once the DPC level is locked in, that's all the grower will be paid for that wheat from the CWB. Further adjustment and final payments from the pool are forfeited.

According to their literature, the CWB takes a "basket" of North Dakota and Montana elevator bids, translates them into a gross port price, and uses that instore value as starting point from which to determine the price for grain delivered to interior elevators. As with other CWB pricing options, the deductions including freight, dockage, handling and other charges are then subtracted to arrive at the local value, which is the most

relevant to this study and an individual farm's breakeven price level and cash flow situation.

It stands to reason that the DPC was developed in response to Prairie farmers' complaints that U.S. elevator bids are consistently higher than CWB returns. Whether or not this contract offers a solution to this problem remains to be seen, because in the process of averaging out values, moving them to instore position then backing off freight and deductions to interior Prairie points, any value signals the U.S. cash market might have been sending about the wheat in question are lost.

Another major difference between the DPC and all the other CWB pricing alternatives lies in the calculation of quality spreads assessed between the grade delivered and the benchmark No. 1 CWRS 13.5% price. The unique application of daily varying quality spreads highlights how significantly the price paid for a particular grade can be affected depending on the pricing option it's applied to and day it's delivered.

As noted above, whether grain is priced under the Fixed Price or Basis Contract, Early Payment Option, or simply through the pool accounts, growers are only paid the initial payment upon delivery for the specific grade and protein level of the wheat delivered. Top-ups are then mailed out for the difference between the initial payment for the benchmark grade (for example No.1 CWRS 13.5% protein) and that same grade's FPC, EPO or final pooled payment.

Thus, in the case of the FPC, Basis and EPO, the spread in the current initial payment is the premium or discount that will be applied. In the case of pooling, whatever the spread in the final payments ends up being will be applied. With the DPC, the CWB introduced an entirely separate list of grade and protein premiums and discounts to be applied to deliveries of wheat under this contract, which changes daily.

The DPC, based on U.S. elevator bids, reflects different quality differentials than the initials, because the latter takes into account historic averages, sales already made, forecast price levels on sales yet to be made, world market grade/protein spreads and possibly other factors, in addition to current cash spreads in U.S. markets. The difference between the quality spreads in the initial payments – set by the government before the overall profile of the year's crop is known – can be drastically different than what the U.S. cash market is reflecting.

Initial payments and the inter-grade spreads within them only change three or four times per year, whereas the quality spreads applied to Daily Price Contract deliveries change from day to day. Because of this important difference, growers with tonnes committed to the DPC have the added consideration of timing deliveries according to trends in the spreads in attempting to maximize their return. The idea is to optimize the quality premium earned, or minimize the quality discount applied, by applying deliveries to whichever contracting option shows the most favourable spread.

It can require significant time and mental energy for an individual farmer to further segregate different grades of wheat harvested and micro-managing deliveries, but spread differences suggest the effort is worthwhile. On August 29, 2006 for example, the premium that would be applied to a delivery of No. 1 CWRS wheat with 15.5% protein over the benchmark 13.5% protein level would be $34.80/tonne under the FPC or Basis Contract, or the spread between the two grades in the current initial payment schedule that is cemented upon delivery. Under the DPC, the premium on the day was $5.99/tonne. In other words, in an environment of multiple grades and contract types, figuring out how and when to best apply each to maximize profits for the farm is worth about $28/tonne.

With all PPO's, there are no preferential delivery opportunities over pooling. Delivery calls are made in the normal manner, and remain fully separate from pricing. With the latter being determined through a regulated quota system, the lack of an inter-temporal price signal is the factor most unlike privately-traded non-Board markets. The information that comes through carrying charges in the futures and spot versus deferred cash pricing opportunities is masked through the delivery quota system, leaving producers unable to respond to the relative need of the marketplace for deliveries of their crop now versus later, as well as to their own particular needs to move crops to avoid the risk of quality downgrading or to generate cash flow.

Yet similar to the case of canola, privately-owned commercial handling companies have developed ways to manipulate the flow of Board grains into primary handling facilities that resemble cash market pricing mechanisms. Since the components of a CWB

deduction and a canola basis are largely the same, the margin portion can be squeezed or inflated in the same way to increase or decrease the price available. Professional opinion gleaned from conversations with western Canadian grain companies, and the farmers they deal with suggest that the ability to cut margins on CWB crops to attract grain is significant. Grain companies use a portion of these revenues, which would otherwise be absorbed in their handling margin, to pay trucking premiums and blending upgrades on Board grains, just like they adjust their canola basis or the margin portion of a special crops price backoff to present a cash market signal about the facilities' relative desire to take in a particular grade at a particular time. Appreciating this aspect of handling margin manipulation offers an opportunity, similarly to responding to an attractive basis against futures, for producers to improve their negotiating position and increase the net price paid for CWB crops, in particular when they can find an elevator in need of the grade and quality of their crop.

In summary, while the CWB system provides annual pooling plus other new creative alternatives, these are complex and increase the marketing challenge for the farmer. The key difference between CWB and non-Board pricing remains the fact that the former does not publish, nor utilize in its non-pool cash pricing contracts, information about actual prices of sales made, nor the corresponding costs to execute them, as is accessible in privately-traded markets. Rather, they choose to keep those values confidential, masking signals that might otherwise come through to Prairie farmers, and reducing the transparency of wheat and barley prices within western Canada. The delivery economics, supply/demand considerations and other normal basis-influencing factors come through

the CWB deduction in some cases, which makes that portion slightly analogous to a non-Board basis or special crop backoff calculation.

2.2 Major Players

With the basics of pricing systems for Prairie crops and the backoff/basis/deductions concept as a background, consider the industry in which these calculations play out. Over the years, different types of organizational models have come and gone, some with farmer ownership, all with varying degrees of success. This section describes the major players in the industry today, and explains where farmers fit in, given the adaptation, re-structuring, rationalization and consolidation that the industry has undergone in recent decades.

The organization most stable through this evolution is the CWB and its marketing monopoly on sales of wheat and barley for export and domestic human consumption. New contracting and payment options are offered to farmers as alternatives to pooling as noted above, but they are linked to the expected pooled price. Protecting the integrity of the pool accounts remains a primary goal of the governing Board of Directors; daily cash market offerings are not part of this system. In other words, there is no new advantage being offered in terms of price signal transference.

Whether one is in favor of the monopoly and the pooling concept or not, it must be recognized that by definition, market signals to farmers are not daily spot valuations,

thereby making comparison difficult. This is an aspect of the grain handling industry that would change if the current government's policy to introduce competition into the marketplace proceeds. In a new, open market environment, private companies could formulate their bids for western Canadian wheat and barley in the same manner as they currently do for other Prairie commodity crops: by subtracting from the value in their next-use market (instore Vancouver, a domestic or U.S. mill, FOB Thunder Bay, etc.) the costs to move it there, to arrive at a cash price delivered to a local collection point.

The potential for change, not just in the pooled vs. cash market pricing signals described above but also in the freight rates applied (the Freight Adjustment Factor alters the actual cost of transportation for each individual growers' crop), contract terms available and other components of the calculation important to farmers, provides further justification for formalizing a farm's marketing situation. The pricing framework outlined above and the description of the mechanisms used in each sector might also be extrapolated to anticipate the implications of possible policy scenarios.

Monumental changes have already occurred in the grain handling sector of western Canadian agriculture. Since 1977 the number of primary elevators in Canada has dropped from 3,739 to just 352 in 2005(Canada Grains Council), as the line companies abandoned old, wooden elevators in favor of new, concrete and steel high-throughput terminals. With most new elevators having the ability to handle four to eight times the grain of an old one, the number of facilities required to move the Prairie crop was reduced accordingly. Producers were not pleased with this change, mainly because it dramatically

increased the distance from farm to elevator. In response to the outcry, grain companies began offering trucking premiums, which were to help offset added freight costs, but quickly evolved into a competitive price signal, evidenced by the fact that some elevators now offer one flat trucking premium to all farmers, regardless of location. The use of trucking premiums and their counterpart blending upgrades have introduced a pseudo-competitive mechanism to the regulated CWB markets. Moreover, they have added to the appeal of dealing with large-scale producers, because grain companies can lower total transaction costs by dealing with fewer sellers of larger quantities, through these incentives.

At the same time as the number of physical delivery points was drastically cut, the stage of players in the markets for farmers' crops changed too. In 1995, seven major Canadian grain companies owned 93% of the elevators and by 2004, these same companies in their restructured forms operated just 74% of the grain collection network (Canada Grains Council). During that time, new multinational grain companies entered the market and some smaller individual elevator stations were taken over by independent players. It is interesting to note that the closure of many smaller local facilities and the distrust of the new multinationals created the opportunity for the 'other companies category' of elevator operators (a portion of which are farmer-owned inland terminals) to increase from 19 to 46 during the same period.

Thus, one can see how grain handling ownership is evolving in western Canada. Corporate restructuring created a renewed incentive for farmer investment in the grain

industry; the closure of the older, smaller elevators opened the door to small, local companies to operate one or a few; both of which end up being more attractive business partners for farmers who distrust multinational companies, and are angered with the failure of the co-operative movement. This has helped to maintain a breadth of different types of buyers in the marketplace, and a healthy diversity of competition for farmers' deliveries.

But neither elevator rationalization nor the entry of some smaller, newer players in the market has streamlined the process to introduce enough of the right new types of players to increase liquidity and improve the effectiveness of Winnipeg Commodity Exchange (WCE) futures contracts overall for farmers in western Canada. Despite showing an increase in volumes since converting to an electronic platform in 2004, the bulk is concentrated in the front months, which are said to be the preferred position of large speculators and investment funds who are not involved in the corresponding cash markets. Farmers who are involved in marketing cash crops over time feel the effects of lower liquidity in the deferred contracts via a difficulty interpreting inter-month spreads. For example, a farmer consulted for the purpose of this research told of attempting to roll a November 2006 basis contract to the March 2007, at the closing spread of $13/tonne. The grain company, as well as futures brokers contacted for verification, indicated that even though the spread *closed* at $13/tonne, it was *actually* $18/tonne (not including brokerage or other exchange-specific fees), and the latter would be deducted from the growers' basis in rolling the contract forward.

There are other limits to the effectiveness that WCE contracts offer in terms of farmer risk management, including the loss of the flax futures contract, which happened concurrently to the decline in the number of grain companies that traditionally handled and traded the crop. In the case of canola and feed barley, a more established and diverse range of buyers allowed the contracts to survive the transition to fewer companies in the industry that traded futures, but the flax crop is smaller as is the number of end users. Manitoba Pool Elevators merged with Alberta Pool to form Agricore, which subsequently merged with United Grain Growers. XCAN Grain, a marketing company for the three Prairie pools was absorbed into the new entity, which is known today as Agricore United. Four companies became one. While it remains to be studied and published, this reduction in players and the drop in flax trading volumes that occurred just months after the companies re-organized offers some evidence that the consolidation hurt the effectiveness in the contract.

While the effects of elevator rationalization and the merging of companies have been significant vis-à-vis producer pricing and risk management systems, the restructuring of the Prairie Pools has had arguably the biggest impact on farmers' position in the marketplace. When producers 'owned' the pools, the incentive of elevator agents giving them pricing advice was inherently different than it is now that they serve shareholders. Furthermore, if a pool elevator agent gave a farmer bad advice (for example, to sell at too low of a price), and the elevator profited as a result, the provision for dividends sent these profits directly back to the farmer. Today, if a farmer makes a poor marketing decision, it benefits the elevator company and secondary trading benefits accrue to shareholders.

Thus elevators, while performing a necessary and valuable service to farmers by moving bulk crops off the Prairies, are not structured in the same way to operate in producers' best interests as they were before.

This illustrates the ways in which emotion, philosophy and attitude play into the decision-making process for producers, making it important to clarify two key points. First, a buyer will never pay a farmer more than the crop is worth, based on the price in its next-use market less the cost to move it there. Secondly, the position of buyers, vis-à-vis farmer sellers, whether it be a multinational, a former pool or an organization that sells on behalf of all farmers, has changed dramatically in recent years, and appears likely to continue to do so in the years ahead.

The naturally conflicting incentives described above point out the differing goals of farmers and buyers, in all cases of marketing crops from the farmgate into the marketplace. The purpose of clarifying these positions is to begin the process of bridging the world of a farm's internal financial situation and the marketplace he or she approaches to sell crops, which is the essence of developing a marketing plan.

2.3 Behavioural Assumptions

The economic theory that surrounds the question of farmers' marketing performance revolves around supply and demand of the market and its interplay with the farmer as an individual price taker. However, as the above section has shown, signals may or may not

be transparent or comparable. As well, the relationships with and between agents are complex. Simplifying assumptions should prove useful to clarify the incentives and rationale in analyzing farmers in the interface between their fields and their next-use buyers.

Buy low, sell high: Whether they source the crop from a regulatory agency or a private company, the objective of grain buyers is to obtain the crop at the lowest possible price while the objective of producer sellers is to obtain the highest possible price for their crops. The stark reality of these opposing forces makes it difficult to imagine a situation where either party would willingly assist the other to optimize their outcome in the course of a transaction.

The Law of Supply and Demand: In commodity markets, the equilibrium price is arrived at when and where the supply and demand of a commodity is balanced. Supply and demand forces impact the net price paid to a farmer at several stages in the supply chains, for example in the futures market and through the basis, or in the CWB's payments and again at the local elevator level. Commodity markets are particularly volatile due to the uncertain impact of weather on supplies; their substitutability and varying elasticities that impact demand.

Farmers are Price Takers: The idea that the world's farmers as individual agents cannot change the price they receive through their activities is based on the theory of efficient markets and is called into question from various perspectives in the literature. For

example, farmers can affect their price by fully exploiting available market information, and timing sales to their advantage. But the basic notion that any one farm's volume for sale does not affect the *world* price holds when the focus is on farm commodity pricing in a general sense. Crop options (organic) and business structures (seed growers) exist where an individual farmer has considerably more power in his or her marketplace, but these are not commodity-crop supply chains and as such do not fall into the scope of this analysis.

Farmers are Profit Maximizers: Farms are businesses and as such, attempt to maximize profits. The justification for developing a marketing framework to maximize farm profits hinges on the assumption that a fair amount of concern arises on the part of the farmer when margins are negative.

The goal of this section has been to show how complex the industry is in which farmers market their crops. There are different pricing and contracting systems at play, each with its own advantages and disadvantages, which will be perceived differently by individual farmer marketers. There are varying degrees of competitiveness in each crop sector, and price transparency. The degree to which a farmer acknowledges and puts these insights to work for their operation can significantly affect their returns.

Chapter 3: Literature Review

In the previous sections, the need for farmers to carefully consider the markets they are selling into was established, along with the challenge facing them related to the disparity and complexity of the pricing and marketing systems at play. Through good times and bad times, the situation is different for farmers today than the previous generation, even while many of the factors influencing decisions, such as business relationships, philosophy and the impact of foreign forces, have not. The importance of safety nets in stabilizing farm profitability is underscoring the dramatic situation currently at hand are the responses given by Prairie farmers to the 2006 Canadian Wheat Board Annual Producer Survey: 84% feel that agriculture is 'off on the wrong track' and seven in ten expected to lose money in 2006. It stands to reason that the focus of this analysis, to offer solutions to improving the marketing performance of these farms will be of interest.

In their discussion of change in agriculture and how it relates to the co-operative movement in western Canada today, Fulton and Sanderson (2002) list a host of operational and industrial transitions, noting in summary that "marketing has taken on greater importance, arguably becoming the most important role carried out by the farmer." Yet reports from frustrated farmers suggest that while the above may be true, success rates are low. An article in the November 2005 issue of *Country Guide*, entitled "Are You Hardwired for Marketing?" suggests this frustration is due to an imbalance between marketing goals and personal risk tolerance. Author Edward Clark refers to research done with farmers by Paul Tieger and Barbara Baron-Tieger using the Myers-

Briggs personality test. Their book, *Do What You Are*, identifies the personality well-suited for the production facet of farming as a 'sensor': one who is pragmatic and accurate; who prefers the real and the concrete; and who works diligently on projects that absorb his or her interest. According to Tiegers' research, many farmers are 'extreme sensors'. On the opposite end of the spectrum is an 'intuitive' personality, one who likes thinking in conceptual rather than in concrete ways; and is prone to analysis. Marketing is said to be a natural profession for intuitive personalities because they enjoy fast-paced, charged environments and thrive on change.

It follows, then, that many western Canadian farmers look for immediate fixes to optimize their marketing performance. The CWB survey referenced above provides further evidence: 63% of Prairie producers surveyed want wheat marketing to remain the sole responsibility of the CWB, and 40% feel that private grain marketers get better prices. Reading between the lines, producers seem to want either the government, or the private trade, to take the responsibility for marketing their crops. However it is the farmer alone who bears the risk of business failure.

Precisely what value the various organizations in the interface do offer farmers lies outside the scope of this analysis, but their pricing and contracting activities do impact the type and degree of risk management-ability farmers have access to, and the quality of the market valuation signals that come through prices. The CWB's practices of artificially adjusting inter-quality spreads within the pool accounts (sometimes referred to as cross-subsidization in previous literature), for example, mask the true value of the

different types of wheat grown, and their profitability potential at the farm level. To illustrate, the Economics and Competitiveness unit of Alberta Agriculture, Food and Rural Development's paper on Canadian Wheat Board Government Guarantees explains how the CWB's borrowing guarantee, through the Credit Grain Sales Program (CGSP) "gives the CWB a false competitiveness in the feed barley market," essentially through a government subsidy that comes into the pool through the net interest earnings. They note the wheat pool also benefits from a $3-5/tonne net interest earnings distribution, and is used to increase CWB wheat bids.

No matter the slant, that this pricing policy appears in the literature on grain marketing in western Canada underscores the importance of this discussion about farmer responses to pricing signals. There is no question that a subsidy increases the 'profits' of farmers collectively who market through the CWB, but research has not been found on the effect this has on price transparency, which may in fact create system-wide costs of planting and production decisions based on inaccurate market signals. Furthermore, the federal government has not been quoted in the literature as only wishing to support those who sell through the CWB with this subsidy, yet not all farmers who participate in the pool accounts share in this subsidy equally (some may not, depending on what they grew), and those who opt not to grow crops for the CWB are left out entirely. Acknowledging that the CWB receives this subsidy from government and understanding how they apply it may affect producer decisions and profitability accordingly.

In all markets, it is apparent that accurate, transparent market pricing enables farmers to make better marketing decisions because the value of their business' output is clear. Lack of transparency in pricing is a symptom of inefficient markets, an issue which is often raised in the literature on farmer marketing performance. For example, in developing an effective benchmark against which to measure marketing advisors' recommendations in the United States, Good, Irwin and Jackson (1998) note that "if markets are efficient, the observed price at a given time within the marketing period (after adjusting for carrying costs) should closely approximate the average of all prices available over the entire time frame." As will be shown here, western Canadian crops have few corresponding futures markets and cash price signals are masked through regulation and low liquidity, creating subtle but significant static variability (i.e. wide differences in prices from one buyer to the next, on the same day for the same quality of crop in the same area) that makes assessment of observed prices very difficult.

In addition to static variability in Prairie cash markets, many of the futures market prices have been shown to follow patterns over time. This violates the principle of efficient market theory, that "the price of a commodity reflects all currently available public information" (Smithson, 1998). Blank et. al (1991) point out that the success of technical trading systems in identifying price trends negates the assumption that price changes follow a random walk. 15 years later, the increased use of technical trading systems might be interpreted as verifying this claim. This perhaps explains the dichotomy noted throughout the AgMAS project research sponsored by the USDA and managed by Good and Irwin (1998). On the one hand, there should be little potential benefit from a

professional marketing strategy, yet there is considerable demand by farmers for market advisory services, both in western Canada and in commercial crop growing regions around the world. The notion of simply mimicking the buying and selling activities of 'the funds' who follow pure technical trading systems, has been popularized in the speculative community of the futures trade in the past decade, simply out of respect that the size of hedge and index fund positions in the market make their trading goals self-fulfilling. The use of technical information and trend-following trickles down to farmer-marketers of futures-traded crops the world over, either through a newsletter they may subscribe to or from undertaking this type of analysis on their own, with the potential to improve their marketing performance and increase their profitability accordingly.

In the process of highlighting the unique inefficiencies at play in western Canadian crop markets, this study also explains in detail how farmers are selling their crops. This is similar to the rationale for Cunningham, Brorsen and Anderson's 2004 study of marketing styles and performance of wheat producers, to "further investigate producer decision-making" because of "a lack of real-world knowledge of what farmers are doing."

Blank et. al go on to discuss efficiency in terms of the social value the markets provide through improved resource allocation and risk reduction. Farmers need markets to be efficient because accurate prices send the most appropriate signals about which crops to plant, and when they should be marketed. Whether a market responds quickly and accurately to new information affects firm-level decisions in the short-term and long-term

profitability and planning activities industry-wide. All of these feed into a producer's marketing style, and how well it works to maximize the operation's profitability.

Fulton (2002) points out an additional challenge facing farm marketers in western Canada today. "Marketing options for many crops and livestock products have proliferated, and are increasingly complex, linked as they often are to input use, quality attributes and/or contract terms." Coupled with their risk tolerance, farmers' appreciation for this fact must be taken into account when approaching the question of marketing successfully, because each of these facets has an impact on the profitability of the farm. It is for this reason that the specific marketing tools available for crops (in three separate segments defined by market type) are clearly analyzed here along with an assessment of their respective risks and rewards.

A producer's familiarity with and understanding of the markets, combined with personal risk tolerance, are the key characteristics that determine his or her odds of marketing success using a particular strategy. Studies are underway on the impact of marketing style and risk attitude because "growers are not the heterogeneous group they have sometimes been treated as in the past... not one marketing style fits all (Clark, 2005)," which will complement the approach taken here to develop a unique marketing strategy for a farm based on its own goals and constraints.

It also stands to reason that studies of farmer performance versus an industry average or range in prices over a set marketing window can be taken further. As part of the AgMAS

project, Irwin et al (2004) compare the sales recommended by market advisory services versus an average benchmark price. While the benchmark was clearly necessary for the purpose of answering the question posed to the AgMAS research team, and the reasoning behind its calculation thorough (Good et. al. 1998), the evidence suggests the variance in the opportunities presented to different farms alone can affect their performance, in addition to methods used to incorporate the individual agent's objectives, constraints and goals into its actual grain marketing activities.

Even if it were relevant to all farms in the region, a market price benchmark would be difficult, if not impossible, to calculate in western Canada. As is shown in Table 1.1, 16 of the 18 main crops in western Canada do not trade against a liquid, Canadian dollar-denominated futures market. As discussed in Chapter 2, crops that trade against U.S.-based futures markets are not correlated well enough to cash prices in western Canada to use their price series for analysis. Reasons for this include the fact that Canadian oats, wheat, etc. are not deliverable against these contracts, and that there is significant basis and exchange rate risk associated with the distance between western Canada and the delivery region. Crops with no futures market whatsoever are less traceable, with no global transparent pricing mechanism to benchmark the core value, which lends to more variability of top-end pricing and the costings in between it and the bid to the farmer. The result of high static price variability, combined with integration and inter-dependence of supply chain members, is that "producers must shop around for the best marketing deals to a much greater extent than before... and that the cost can be considerable" (Fulton and Sanderson 2004).

As will be shown, the lack of consistent, transparent and accurate valuation of Prairie crops through market prices is but one of the challenges producers face in the attempt to maximize profits. The "apparent lack of real-world knowledge of what farmers are doing" exists because this, and each one's disparate ability to manage financial, operational and emotional issues within these markets, have not been acknowledged or quantified.

Chapter 4: The Theory of Farmer Profit-Maximization and Commodity Marketing

This study asserts that every farm is a unique organization in need of its own proprietary marketing strategy to achieve maximum profits. It also highlights the challenges and market imperfections that farmers face as they approach the markets. To begin, the theories of market efficiency and farmer profit maximization as it relates to commodity crop marketing must be established.

Neoclassical economics drew upon the concept of utility to develop the notion of supply and demand including aspects of business and life that are difficult to quantify and estimate. Positive attributes in farming include the pride in owning one's own land, the joy and work ethic children derive from participating, and the sense of accomplishment in carrying on the family tradition are just a few examples of the non-monetary lifestyle advantages of farming. Others find farming difficult: the isolation of living far from neighbours in shrinking communities, the reliance on weather for success, and the stress of managing large amounts of assets (especially if the responsibility to carry on a family tradition was not the farmer's true career choice). These factors are all somewhat related to finances, but are not problems to which a cost can be directly applied.

4.1 Farmer Utility Function

Revenue and costs are the drivers of a modern farm and are the heart of a marketing plan. However, other non-monetary factors are important, for example the farm's vision,

mission and strategic approach. It must be acknowledged that these play into long-term planning and business development, and that related emotions such as greed, fear, ego and pride can interfere with fully rational decision-making in day-to-day marketing and sales activities.

Therefore, analyzing profitability only through revenues and costs misses an important aspect of economic agents' mental processes. Consider a Farm Utility Function (FU) that incorporates both dollars-based profitability and the relative enjoyment or discomfort of the agent, as follows.

FU = (R - C) + (S - P);

Where:

R = Revenues;

C = Costs;

S = Satisfaction; and

P = Pain.

Although R and C are measured in dollar terms, neither S nor P can be quantified in a monetary sense. Further complicating the objective assessment of S and P, and underscoring their importance, are the examples where effects extend beyond an individual farm. Some rural residents are pleased with hog barn expansion because of the added tax revenues and spinoff economic benefits these allow for the wider community,

therefore adding to the collective S; but the portion of the community that inhabits the neighbouring yards will subtract the collective P due to odour. Public research, discussion and policy within Canada on topics related to Satisfaction and Pain are not well-developed at the farm or community level. This may be because the discussion is politically sensitive: tax revenues and rural economic growth on one side and personal property and lifestyle rights on the other.

The notions of S and P are useful in discussing the effects of emotion, politics and philosophy, which often play a role in sales decisions, as well as risk tolerance. Risk may not fit the traditional definition of 'having many possible outcomes' in the context of this research, which attempts to address key financial success factors and non-monetary variables in marketing. Farms face financial risk in the short and long term: from one year to the next, their primary concern is the chance of netting overall less revenue from growing the crop than was spent to produce it. In the long term, perpetual negative margins will lead to the farms' failure. In this sense, financial risk can be measured in monetary terms by assessing the difference between estimated revenue and cost prospects for a particular year and comparing this to the farm's need to build, rejuvenate or avoid reducing equity, but these are still subjective measures. Emotional risk tolerance on the other hand, along with being fully subjective, cannot in very many cases be measured in dollar terms, but will contribute to a growers' 'satisfaction' or 'pain' in marketing. Some farmers feel extreme discomfort having an open futures position and will be constantly watching the market, while others will take great comfort from having taken steps to lock in the price for their crop.

There are examples in cash markets as well. Contract terms differ by crop and from one buyer to the next, but rather than there being one 'best' option, enhanced risk management attributes such as an Act of God clause that some offer will be worth the cost to some farmers and not others. Another example in which satisfaction can make up for a price discount is in CWB pricing: strong supporters of pooling may disregard possible premium prices available under the alternative systems, while detractors overlook the advantages of price discrimination and price averaging over time.

It is generally believed that both types of risk contribute to 'pain' on the part of primary producers and indeed this is likely to be the case for most during tough times and low price prospects, due to the risk of business failure related to negative margins. But certain personality types view price risk as opportunity, and enjoy their work more by virtue of being able to apply creative strategies to the job of selling crops, in dynamic, liquid market environments. This is why the distinction between emotional and financial risk tolerance is important: the former can be incorporated into an individualized market strategy in whichever way most suits the farm's profile (and as such is the type more pertinent to this study), while the latter can be measured in the same manner across farm types based on the assumption of profit maximization.

In addition to the risk management tools available and their effectiveness; the ease of value signals to be transferred between buyers and sellers and responded to; and the degree of profitability in farming are also important attributes of market structure. In

varying ways, each consideration contributes to Satisfaction and Pain, and Revenue and Costs. The complex behavioural interplays between the different aspects of marketing come on top of the analysis of revenue and cost flows, which may be conceptually straightforward but is actually quite difficult to measure in practice, further justifying the practice of gathering together the relevant information into a plan and ensuring the estimates are as accurate as possible.

4.1.1 Market Attributes for Planning and Decision-Making

Price risk management is understood as protecting the farm against the price of its crops falling between the time of seeding, to storage or selling. In practice, it encompasses many aspects of farming and marketing: avoiding crops the market does not want; reviewing each buyers' contract terms, offered price, and how they are to do business with; maintaining an understanding of the price outlook for all crops; and updating the plan accordingly. The volatility and uncertainty of market prices can be managed to a certain degree but the risks and rewards of various tools available in each crop sector differ.

Receiving, interpreting and responding to market signals is key to maintaining a position in various markets in which the farm's risk is well-managed. Ease of value signal transfer and response can also reduce the workload involved in marketing. The starting point in the theory of market valuation is an explanation of how commodity prices convey value in time, place and form at all times.

- Time: The time value of a crop is most transparently reflected to farmers through inter-month futures carrying charges, which reflect the cost of storage and interest related to owning a crop over the stated period of time, according to the storage rate specified under the terms of delivery against futures and the current bank interest rated. It is less common to see crops without futures markets display carrying charges for different delivery periods. Certain varieties of Board grains are paid storage for late delivery, but at a rate below commercial calculations. All crops tend to show significant differences in valuation between crop years. The example seen most often is a high spot price in June or July, when supplies of the previous year's crop are running low; and a lower price in August or September when harvest will begin and supplies will be ample.
- Place: Farmers also have choices in marketing by place: pick up on the farm; delivery to the closest elevator, to a domestic processor at a further distance from the farm; by producer car to a port terminal elevator, all of which reflect each buyers' level of demand. Futures contract specifications clearly state the region where the posted price reflects the value of the crop, such as central Saskatchewan in the case of canola; Minneapolis or Duluth in the case of oats. Cash contracts for markets without futures also state the delivery point, which are different from the FOB farm value of the crop by the cost to haul it there. In the case of Board grains, prices are quoted instore Vancouver or the St. Lawrence. In all cases, farmers report that by delivering outside their own area, where the crop quality outcome may be different, the price applied to their crop can differ greatly from

what local buyers assess it at, reflecting the relative supply and demand of the types of crops buyers need over space.

- Form: Quality spreads indicate the crop's value according to its form, sending signals like premiums and discounts for particular characteristics in the grain. Futures contracts state the discount or premium to be applied to the non-standard grade upon delivery, as do most cash non-futures contracts. Marketing to maximize the quality spread is important in non-Board grains and CWB crops. For example, a farmer can maximize the price paid by the CWB for his or her wheat by applying various qualities to the different pricing contracts, over the course of the delivery quotas allowed, affecting the net price achieved significantly.

As such, time, place and form are central components of a farm marketing plan. Farmers who are not able to clearly interpret these price signals are at a disadvantage. This standard theory of commodity price valuation is complex and varies greatly from one crop to the next, but it is also central to commodity price analysis and the formation of marketing plans.

Profitability potential is most critical to this analysis, and it too differs by crop, and under different market conditions. But note the reference here is not to 'profit maximization' as in the objective of farms who wish to stay in business; rather, it refers to the underlying structure of the marketplace and its ability to consistently pay prices above a normal farm's cost of production. A major aspect of marketing is 'growing the right crop in the

first place', which can mean recognizing structural differences that offer inherently better profit potential, and avoiding profitability pitfalls that come with some crops related to inflexible pricing and delivery. These ideas will be discussed in the next chapter.

The need to incorporate S and P factors into Farmer Utility becomes evident when one considers how these identified areas can be influenced by the farmer's level of education, interest in marketing and time spent on the job. For example, a marketer may not have accurate cost estimates, because of an aversion to financial management or poor math skills. His or her ability to market at profitable levels is crippled accordingly. If the marketer doesn't understand the differences between pooling and the alternative Board grain pricing options, they are at risk of making errors in judgment that lead to lower prices and profitability. Even farms that have trading accounts, which might be considered a proxy to having the right personality type for marketing regularly end up using their farm hedge accounts to speculate on currencies, financial instruments and commodities unrelated to the farm business.

These examples are intended to further underscore the importance of creating a plan that takes all of the standard decision-making factors into account, in the context of the individual operation's capabilities, needs and style. Estimating costs accurately would be considered painful for some; and ease the stress for others. Market inefficiencies, on the other hand, are important to revenue potential and may introduce Pain related to confusion about market signals, but they have an impact on Farmer Utility. They are factors that farmers should not ignore.

4.2 Market Inefficiencies

It is easier to appreciate the lack of widespread efficiency in Prairie cash markets in reference to the portion of crops that trade under the various types of marketing systems. Consider again Table 1.1, which grouped the area seeded to primary commodity-type crops in western Canada in 2005, the last year for which final data was available at the time of writing, a decade previous and thirty years ago. The portions will differ from year to year based on numerous dynamic forces, but the trend in production of crops that trade against a functioning, Canadian dollar-denominated futures market, those that do not, and crops marketed by the Canadian Wheat Board clearly drives a the need for more research into farmer marketing processes. The portion of the western Canadian crop marketed through a monopoly dropping in half in the past generation, and only one third trading against a hedgeable futures instrument, is significant to farmers' ability to manage risk and maximize profits from grain marketing. The growth in pulse and special crops production has introduced an entirely different set of risk management tools and pricing structures into the mix. It is important to acknowledge that this diversity creates inefficiencies that do not exist in similar crop-producing geographies such as eastern Canada and the United States, to which Prairie farmers are often compared.

The standard assumptions of efficiency can in cases be applied to crops tied to a futures market, but one must be careful applying the standard analysis to their corresponding cash prices. At the local level, situations frequently arise between farmers and the

elevator agents, processors or brokers they sell to that further cloud pricing signals leading to wide ranges in bids that do not arbitrage themselves, most obviously in the case of feed wheat. Increased hauling distances following elevator rationalization widened the radius from which farmers must consider as 'the market' to determine the best bid for each sale. Likewise, individual facilities have increased the base of grains drawn from, introducing better blending opportunities, which also contributes to static price variability. Some companies have also vertically integrated grain buying with crop input sales and financing activities, which create non-price incentives to market grain into a particular location that are especially difficult to quantify. Such non-transparent structures in pricing act as market inefficiencies at the local level and combine with inefficiencies in higher-level pricing that will be described in Chapter 5.

Part of the problem with assessing any group or individual's marketing performance is that it must be compared to a benchmark series of the prices available in the market. As will be shown in the discussion of farm-level variables impacting marketing decisions, the choice of marketing window alone may or may not render the series a fair comparison; more importantly, there remains the inability to obtain consistent, unbiased prices. Inconsistent, variable and biased pricing may be available in some markets, but even weak-form pricing efficiency requires a spot and futures price series to test the hypothesis, which won't be available for the approximately 60% of the cropping mix that is not hedgeable.

A final clarification is needed between the theory of profit maximization described above, and the objective of maximizing revenues that is pervasive in the grain economy. Individual farm profitability refers to the difference between the overall net weighted average selling price for a farm's crops compared to the total of all costs incurred by the farm up until the point they are sold. However many farmers, and the Canadian Wheat Board on their behalf, stop at maximizing revenues, or extracting as much money out of the markets as possible, which is a related but not identical goal to maximizing individual farm profitability. The sales activities associated with each crop are not likely to be the same under the two differing objectives: maximizing profitability often involves deciding which crop to sell and which to hold based on their *relative* market outlooks in the face of carrying costs and constraints forcing the sale of something, immediately; whereas maximizing revenues is a function of capturing the highest price available (which nobody can predict) during a particular marketing window. When the goal is maximizing collective revenues of a select few crops from many farms, the unique situation and constraints each faces, such as production mix, grain quality, personal risk tolerance and financial position, are disregarded.

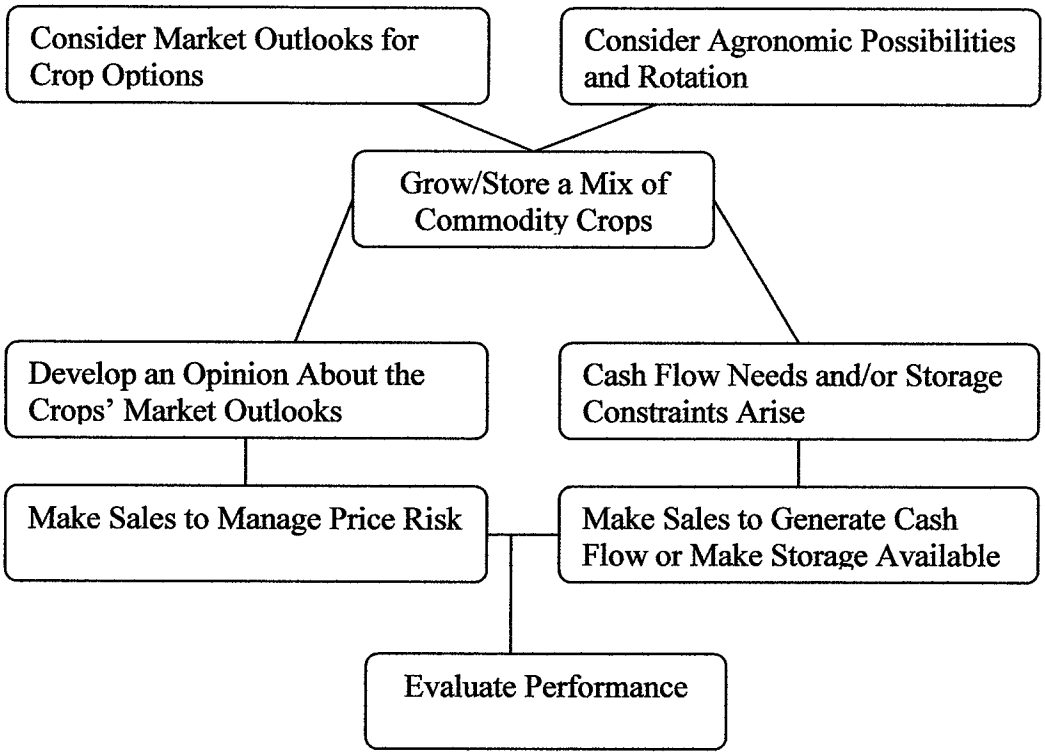
In summary, whether it is a conscious goal or not, the ability of farmers to more closely achieve maximum profits is a topic of timely debate and great importance to the rural economy and the agricultural sector. The farm marketing problem is one of attempting to maximize profits subject to a set of constraints, identified in the following chapter. But illustrating this problem in the traditional modeling framework is made complex by the individual nature of each market, farm and producer. This is why every farm needs to

develop and work off its own proprietary marketing strategy in order to achieve maximum profits.

Chapter 5: Marketing Plan Model Framework

A farmer passes through several stages in the decision-making process of marketing, as shown in Illustration 5.1. Generally, the central consideration is the price outlook for the particular mix of crops being grown and/or stored, but agronomic considerations feed into the process during planting, and quality considerations in storage are an influence post-harvest. Depending on the time of year, the outlook might feed into a decision of what to plant, or when to sell. If the outlook is deemed bearish though a review of market information, the farmer will sell to eliminate the risk of the price falling and a drop in inventory value. If the outlook is bullish, the logical response is to avoid selling to capture an expected higher price in the future. However, the farm may not be able to wait: revenues may be needed to pay bills, or harvest may yield a larger crop than the farm can store, or the quality of the crop may make storing too risky. Such factors limit the ability to position optimally given the market outlook.

Illustration 5.1: The Farm Marketing Decision-Making Process



In practice, farmers flip back and forth between the right and left sides (as seen above) in their marketing activities; from responding to price signals (a bearish market outlook, spot price premium, or sudden opportunity to move a crop that has not been in demand, etc.), to managing operational, financial and structural needs within the farm (agronomic possibilities, quality issues, tax management and crop rotation). It is the marrying of these two worlds, the farm and the market, that is the essence of building and executing a marketing plan. The process identifies how rather than responding to market signals (the left side), sometimes farms are forced into selling just to pay the bills. To whatever extent one believes a farmer (or the market analysts employed) is capable of capitalizing on

good selling opportunities and avoiding marketing pitfalls, being forced to sell rather than responding to market signals has a negative financial impact on farm profitability.

Marketing planning is a two-fold process: the farm must integrate variables specific to its operation into the plan, and it must integrate the information and signals that come at it from buyers of various crops. This must be done simultaneously and on an ongoing basis to optimize Farmer Utility. The complexity of the interactions and processes involved will be introduced in Section 5.1, to provide both a beginning perspective on the scope of marketing plan development, and a justification for undertaking what will seem an enormous amount of work. Section 5.2 offers price structure information in the three different types of Prairie crop markets: those with a functioning and corresponding futures market, those without, and crops marketed by the Canadian Wheat Board. Also included is an explanation of the tools available to manage price risk and to capitalize on opportunities in next-use markets in western Canada. The variables specific to each farm that sales activities are often based on are identified in section 5.3. The resulting framework for a marketing plan, and the expected financial and Farmer Utility-related benefits, are established in section 5.4.

5.1. The Complexity of Prairie Crop Marketing Decision-Making

As previously noted, the process of marketing crops to maximize profits for a particular farm in western Canada is complex. The best strategy for profit maximization will depend on many factors including production, location, storage capacity, cash flow,

financial and emotional risk tolerance, personal business relationships, the manager's temperament and level of education, access to labour, and others. This wide range of variables drives the need for incorporating both financial variables and non-measurable factors into the equation via the Farmer Utility function as discussed in Chapter 4, and for a comprehensive, individualized marketing plan.

The hypothesis that marketing decisions can become more sound and disciplined when made in the context of a thorough marketing plan, leading to less stress and higher profitability, stems not only from the large number of variables but also to the complex nature of their interactions. Consider the four related but separate categories of factors which affect farmers' marketing decisions in Illustration 5.2. This grid shows the simultaneous, but possibly conflicting, forces at play and in executing each individual sale, all of which impact profitability. The forces can add costs and pain to a beginning marketer or one not mentally or emotionally suited to the work. Managing these factors successfully contributes to Revenues and Satisfaction.

Illustration 5.2: Influences in Crop Marketing

	Dynamic – Over Time	**Static – Over Space**
Farm Level	Cash flow needs must be serviced responsibly over time. There is no correlation between cash flow needs and crop price trends.	The sale price for a crop may or may not be above a farm's cost of production and breakeven prices are not known until after harvest, when sales may have already been made.
In the Marketplace	Commodity crop prices move up and down over time, and relative risks and opportunities in the markets for a farm's specific crops.	Wide variability between different buyers of the same crop, on the same day, in the same basic area. Finding the highest bid requires phoning many buyers.

The purpose of this analysis is not to define where the above forces might intersect, but to introduce the perspective that can be gained from gathering information on all relevant variables into a foundation document that becomes a farm's Marketing Plan. Illustration 5.2 also shows two separate process - pricing opportunities that come available over time, and an individual farm realistically positioning itself to take advantage of them– which are both are integral part of the profit maximization equation. For a decision to be optimal for the farm, all of these independent and often divergent processes must be considered simultaneously; taken in isolation, each factor may or may not point to the most successful outcome of a particular marketing decision.

5.2 Pricing and Risk Management Structures in 3 Crop Sectors

As previously noted, "agricultural trade and trade policy occupy a special niche in the discussion and analysis of economic issues," which can lead to the incentives of the various players being misconstrued by politics, philosophy, emotion and, most recently in history, the notion of strategic alliances. To improve their negotiating position, the farm community would be well-served to consider the realities of the situation carefully in marketing transactions. A business editorial in the August 7th, 2006 issue of Maclean's magazine puts it well: "The most basic principle of sound investing and good business is 'buy low, sell high.' It's a mantra so obvious, no self-respecting businessman even bothers to repeat it."

It follows that in the interface between farmers and their next-use markets, each party has its own best interests as priority. This is not to suggest members of the grain industry are unduly taking advantage of farmers or that they are unethical; rather, they are providing a valuable and important service in handling and shipping crops to their next-use markets. Farmers who believe that a particular company or organization is their partner are correct in some ways, but all commercial companies and organizations must live within the realities of the market. Even, perhaps especially, farmer-owned cooperatives must live within that reality.

When farmers believe that some public or private organization is working to help them succeed, it encourages them to let their guard down in marketing. Assuming that the organization they have aligned themselves with is 'taking care of things' simply isn't logical within the framework of profit or utility-maximization for any player in the marketplace. If for no other reason than because none of the agents re-selling western Canadian crops bears the farm-level risk of failure, farmers can expect to be well-served by taking marketing-related affairs into their own hands. Among other things, this involves cultivating an in-depth understanding of price discovery in the markets for the farm's crops, in order to be able to recognize good opportunities when they are presented, to avoid pitfalls and manage price risk appropriately. In western Canada, this also means recognizing, understanding and developing ways of working around inefficiencies in the various crops' markets.

Farm-level 'marketing' and 'risk management' are closely related with similar issues for a farm. But while the marketing tools available in the three main crop sectors are designed to help farmers manage price risk, there are differences in the effect on farm profitability of CWB pooling as compared to a specialty-crop production contract and a futures hedge. Producers consider all of these mechanisms and a variety of related risk/reward issues simultaneously in an attempt to maximize profits farm-wide. Each crop group is addressed individually here, contrasted and compared in terms of the positive business principles each sector offers according to the previously-defined market attributes for planning and decision-making, which include:

- The price risk management tools available;
- The accuracy and consistency of the value signals transferred to farmers; and
- The availability of profitable pricing.

The objective of analyzing crop sectors separately using these three criteria is to clarify the attributes of each type of market as it relates to a marketer's chance of success. The best mix of crops by market type, and the optimal use of the pricing and risk management tools for each, depends on the factors specific to the farm, as well as current market conditions.

5.2.1 Price Risk Management

The term 'price risk management' in Prairie grain marketing circles has referred almost exclusively to hedging, or locking in the price of a crop ahead of time, by establishing an

equal and offsetting position in the futures or options market. The price risk associated with growing and timing the sales of crops without futures markets is sometimes manageable with production contracts, which fix specific terms to the pricing, delivery, quality and other aspects of marketing the crop. When it comes to Board grains, mandatory price pooling is used to smooth inter-temporal price fluctuations. The pros and cons of each of these three marketing mechanisms, from a farm risk management view, are discussed in more detail below.

Before proceeding into this analysis of the specific mechanisms used by western Canadian farmers, the central analytical tool used throughout the world of commodity marketing, fundamental analysis, bears mentioning. Fundamental analysis, or predicting price trends and future risks or opportunities, is essentially the study of supply and demand by crop. It factors into all of these markets in a standard fashion, either through professional opinion purchased from an outside market analyst or through the farmer's own research. Its impact is consistently applied across all sectors through the choice of the tools described below and/or the timing of sales and/or the sell/store decisions. Because fundamental analysis is a part of marketing that no farmer can avoid, further discussion of its usefulness and success rate falls outside the scope of this analysis.

Hedging

Hedging normally refers to holding both cash and futures positions simultaneously, in an effort to reduce price risk (Blank et. al.). It can work perfectly to lock in a profit ahead of

the time of sale in a bearish market, and to maintain a long position in the market even after the crop has moved off the farm. But in approximately 60% of cases, as shown in Table 1.1, a futures market is not available to use in price risk management, which significantly limits its scope of usefulness for a western Canadian farm, or indeed the grain buyers, although they may be better positioned or have a greater need to use imperfect hedge strategies.

One might argue that canola and barley are not the only western Canadian crops with an associated futures contract, citing oats, milling wheat or corn. But in hedging western Canadian crops with U.S. contracts, under which the commodity specification may not closely mirror that of the standard being sold by Canadian farmers, more risk can be added to the operation than the hedge was meant to take away. In order for a hedge to work, the instrument's price must closely correlate with the underlying cash price; otherwise, there won't be any profits on the paper side of the hedge to offset losses in the value of the physical commodity or vice versa. A lack of correlation is also the reason for not including feed wheat as a viable futures hedging mechanism in this analysis.

Because of the lack of local, functional tools available, farmers interested in this form of price risk management have moved beyond the perfect hedge idea to a variety of alternative paper-based price risk management strategies, collectively referred to as cross-hedging. Cross-hedges of barley/corn, feed wheat/corn and canola/soybean oil are commonly recommended by marketing advisors, but usually only under market conditions where high correlation is expected. Growers must also consider the Canadian

dollar exchange rate risk involved in these trades, which can have a significant impact on the final result of a hedge. In the extreme, political and/or policy factors such as a border closing can be devastating through their impact on the correlation of cash and futures.

Where hedging is possible, and risk is not being added to the operation in the process, the question of farmer comfort level and risk tolerance introduced in Chapter 4 comes back into play. The many horror stories that circulate about margin calls on unmonitored positions, poorly-calculated cross-hedges and blatant speculative losses that farmers often incur in the process suggest that this is an area of marketing in need of increased discipline. The marketing planning process offers an opportunity in this respect for the farm to put together a 'hedging budget,' to identify at the outset of undertaking futures and options-based risk management strategies what the farm can afford to lose. Then, based on the crops in the production mix that can be hedged, and the frequency this is anticipated to be needed in marketing each one over the course of the marketing year, the budget can be divided between crops. In the final stage of hedging when the order is being placed with the broker, the farm can apply the budgeted amount for the trade in that crop to the decision of which strike-price option to buy, or where to set the stop on the futures trade.

'Budgeted hedging' epitomizes the usefulness of marketing planning in that it marries the unique constraints of the farm, i.e. its financial risk tolerance, with the signals coming from the market, i.e. that it may be wise to hedge given the market outlook. At the same time, for some farmers with a low emotional risk tolerance for futures trading, they can

increase satisfaction or reduce the pain involved in marketing by pre-planning and limiting their losses.

Production Contracts

Production contracts are mainly used in small-volume special crops; certain Identity Preserved (IP) varieties also apply, some of which may also be tied to a futures market, like specialty-oil canola programs. They are useful in sourcing crops with tight end-use quality specifications that require the field be planted with a particular type of seed or the farmer to follow specific production and handling practices. They can also be used to generate growth in acres of new crop options. For example, production contracts helped fuel growth in pulse crop acres in the past decade, and today are used to originate and market even newer crops like herbs and spices, borage, hemp and forage seed.

Note a structural difference in the pricing of IP crops versus the small-volume growth markets in which production contracts are used. While the premiums applied to the crop's prices in both categories are used to attract acres into production, the calculations made are fundamentally different. In cases such as canola and wheat, for which new varieties with special attributes have been introduced for particular end-use purposes, the IP variety may qualify for a premium over its commodity crop counterpart, but not of a magnitude that reflects end-users' willingness-to-pay. Rather, the added production, handling and storage costs (perhaps related to certified seed use, segregation or delayed delivery) may be estimated by the purchasing company and only that paid to the farmer,

which in most cases will suffice to generate the needed production. When marketing small-volume specialty crops with no futures, particularly those with which a farmer is unfamiliar, the value in the end-use market is the common starting point for the bid price calculation.

The risk of speculating in these small-volume markets (i.e. planting the crop without an end-use contract and a buyer lined up), is managed by a production contract in two ways. First, it guarantees the crop will find a home, which is important due to the ease and regularity with which small-volume markets can become over-supplied. Under contract, the price is usually fixed on a portion of a normal yield, such as one half or one third, and the buyer will have first right of refusal to market any amount produced over the contracted tonnage. If production comes in less than the contracted amount, the second key risk management attribute offered under some production contracts, in some years, is the Act of God or *force majeure* clause, which essentially cancels the obligation to deliver in the event that production is stunted by weather or other factors beyond the farmer's control. Because the Act of God clause transfers risk from the farmer to the buyer (who would not receive enough product), and the rising price in the meantime requires the contract to be cancelled at a higher price, buyers in western Canada don't offer this option unless it's necessary to encourage enough production to fill end-use requirements, or they can offset the risk on their next-use market.

Buyers try to limit acres under production contracts to what their buyers will need in the coming year, assuming normal yields; but excess supply is still a regular occurrence in

crops like mustard, canaryseed, lentils and other common pulse and special crops. Prices then spend long periods trading at extremely low levels, which is necessary to discourage production to correct the over-supply. As producers become discouraged, supplies dwindle, until eventually there is a brief, sharp spike higher, which generates another excess supply that takes several years to work through. Both farmers and buyers can manage the risk associated with these volatile patterns to some degree through the use of production contracts targeted at as precise an estimate as possible of the actual supply base needed. However, nothing stops a farmer from growing the crop 'on spec' (without a production contract), or the weather from altering yields from expected normal levels, which makes prices more volatile and therefore, the risk more important to manage.

Price Pooling

While not unique to CWB crops, price pooling of wheat and barley has historically been the key feature of farmer price risk management in western Canada. The net weighted average of sales made out of the pool, less the marketing costs of the agency, are returned to growers who participate, smoothing the volatility in the market over time and resulting in an approximate average price.

With the introduction of the CWB's alternative pricing contracts described in Chapter 2 above, pricing and payment terms have become more flexible. Farms are able to change their position and risk profile in these crops to better suit their own individual needs, although the delivery restrictions can impose significant costs on certain types of farms,

and price signals remain clouded. In the case of Basis Contracts, there is also a significant difference between the calculations and risk management strategies behind Board grains and privately-traded crops that can be sold under contracts of the same name. Similarly, the CWB *force majeure* clause comes with different cost, payout circumstances and other contract terms vis-à-vis the pulse and specialty crops the clause is also available for. Its cost of $3/tonne in 2006, versus the $20-30/tonne an Act of God clause valued at under dry edible bean production contracts for example, suggests reduced financial protection that is confirmed upon closer examination of the payout terms. Other non-tractable forces can also affect the results of CWB marketing strategies: internal limits on tonnes that may be committed to the program, short sign-up periods against a select few futures contract months, and the impact of delivery restrictions that are independent of pricing.

It must be recognized that all of the above structured, contractual mechanisms for marketing grain are accompanied by speculation related to fundamental analytical opinion, like a lower-than-expected yield outcome, an increase in export demand or growth in a new domestic processing sector. Statistics are not available for the number of farms that subscribe to market newsletters, but the availability of numerous public and private suppliers, and the lengthy tenure of most in providing professional opinion about Prairie crops' price direction to farmers, suggest they are consulted frequently in western Canada and their recommendations are considered worth the cost. Even if farmers do not pay for a market analysts' advice, they all hold opinions about price direction gleaned from their own independent research, free sources of information from government and

the internet, or through conversations with their buyers and their peers. This can be an important price risk management tool in and of itself.

5.2.2 Valuation: The Ability to Receive, Interpret and Respond to Market Signals

If a farmer doesn't know what a crop is worth now versus later, cash flow planning becomes more difficult. If the components of the price and its backoff are not transparent, it is difficult to know when a good selling opportunity is being presented. A high degree of static variability in spot prices adds to the workload of the farmer and increases the risk of leaving money on the table in the process of executing each transaction. The market's ability to communicate accurate value signals has a major impact on each farmer's success, and each crop sector has different ways of doing so.

Blank et. al. argue the futures market serves "a vital economic role. Prices determined by futures markets affect production and consumption decisions... ration available supplies... permit supply and demand to operate in relative freedom to discover prices for both nearby and future time periods." Through the price itself and its distance from a farm's cost of production; its relationship to the local cash price (i.e. the basis) that may affect a sale off the farm; and through carrying charges between spot and future contract months, the futures provide farmers with information about market conditions to aid their decisions. For example, when the price of a nearby month rises relative to the deferred month, the market is signaling a greater need for delivery of the crop now versus later. If the nearby contract moves to a premium over the deferred, the market is said to be

inverted, often considered a strong signal for a farmer to sell now rather than to wait for the lower price to sell at later on.

Production contracts, which are essentially cash-only grain sales contracts with no futures price factored into the value, do not contain the same inherently accurate valuation. The backoff mechanism used to calculate a particular buyer's local price may or may not reflect the highest price available in the next-use market, which fuels the variability between buyers. Furthermore, the fact that the whole price is backed off rather than just the basis portion leaves more room for handlers to charge excessively high margins and other risk management fees in their prices than would be the case if there were simply more participants in the market, and/or if the arbitrage mechanism was at play. This can be especially risky for a farmer in the assessment of forward contract buy-out fees in the absence of an Act of God clause.

Price pooling is clearly a different system than cash/futures valuation, making comparisons difficult. But it needs to be pointed out that in the process of transferring value signals to farmers the CWB's pricing activities alter true market values beyond the basic mechanism of returning to farmers the average of all sales revenue less the organization's costs. As noted in the Literature Review above, using the interest earnings, the CWB adjusts the spreads between grades within the pool accounts in order to provide stable pricing over time and create signals that are consistent with its long-term marketing strategy and not necessarily those of marketplace they are actually selling into on farmers' behalf.

The use of federal monetary transfers to the pool accounts facilitates this use, but in addition there are other non-market influences involved that alter the value signals that come through to farmers. Most recently, the CWB transferred 'hedging gains' from activities related to the cash pricing options into the pool accounts, which can be considered an artificial boost to the pooled price. Many in the private trade would also argue that the CWB's role in managing the rail car supply introduces logistical cost differences between crops, and along the supply chain. Artificial IP premiums applied to new varieties for market development purposes are a direct transfer from revenues that would be otherwise applied to other grades. Finally, as will be illustrated in greater detail below, the interest cost related to regulated delivery quotas and lengthy delays in payment also impacting the final net value achieved for a farmer of these crops, which again lie outside the basic framework of pooling. While noble in their goals, the fact that receiving, interpreting and responding to value signals from the marketplace is highly useful in marketing planning and in responding to signals on an ongoing basis suggests hidden costs to the system.

5.2.3 Profit Potential

Outside global forces can both positively and negatively affect profitability in western Canada, but in recent years the focus has been on foreign subsidies that encourage over-production of crops in world markets and weigh on prices for Prairie crops. Over-supply

affects virtually all crops' markets in the same way: by keeping prices low, oftentimes below a farm's cost of production.

The major exception to the farm's vulnerability to uncontrollable outside forces is the case of expanding crops, where the market must offer profitable prices in order to encourage the needed acreage base. When a market is first developing, once demand is established and brokers or processors decide to begin trying to source the crop from farmers, contract pricing and delivery terms tend to be favorable to farmers. However, once the market is well-established and a reliable supply base comes available (usually once the crop performs consistently well enough to work its way into regular rotation), profitable prices and Act of God clauses are no longer available.

On the surface, this may seem to suggest the best option is to plant one's acreage entirely into dry beans, borage, hemp and forage grasses. Perhaps in some cases, at times, this is true. But on the whole, the above analysis is to show that in addition to maintaining a clear estimate of the breakeven price levels needed to turn a profit, farmers need to understand the different market structures, tools available and pricing opportunities in the different crop sectors. Then they must balance their use given the farm's own situation. Given this diversity, and the varying risk/reward considerations of marketing in each sector, a 'portfolio' approach may work well to manage overall farm financial risk and opportunity.

To illustrate, consider a farm with only IP specialty-oil canola and CWB milling wheat. The canola's production contract may allow for only 20-40% of the crop to be marketed off the combine, while the wheat is subject to the delivery quota system of the CWB, which will fall in a similar range in fall. Generating enough revenue and delivery space at harvest time will be difficult with this mix of inventories, especially for a farm in a tight financial situation. Including crops in the rotation that can be hedged would lend some delivery and cash flow flexibility to the operation to work around its own constraints. This example shows that even in the initial stages of marketing – choosing what to grow – marketing systems and the flexibility attained through a diverse portfolio is important.

It is clear there is no clear solution offered by the markets to maximize the profitability of an individual farm. The risk manageability, pricing structures, transparency and negotiating power all differ for crops marketed under the CWB, those that trade against a functioning and local futures market, and the pulses, special crops, feedgrains and others produced in smaller volume that do not. A farmer with a mix of each in his or her crop portfolio faces a major task in responding to marketing signals, responding to risk and being profitable as a result, as summarized in the illustration below. Based on management's own unique ability to produce at a low cost, store crops, manage cash flow and micro-manage marketing activities, the grower can only define for him or herself which crops will work best.

Illustration 5.2: Summary of Marketing Characteristics in the Three Main Types of Prairie Crop Markets

	Price Risk Management Tools	**Transference of Value Signals**	**Profit Potential**
Crops With Futures	Possible through hedging.	Price discovery mechanism most 'efficient.'	When prices > COP, hedging allows locking in a profit.
Crops Without Futures	Act of God contracts (if available) protect from buy-out risk in volatile markets.	Similar to basis backoff, but more components; riskier.	During times of growth, profits are offered to buy the needed acres and production base.
Crops Marketed Through the CWB	Price pooling.	No daily spot price, although CWB pool estimates can be compared to world/FOB prices.	Subject to world supply and demand; and CWB sales performance.

In the next section, the variables that affect farm-level marketing decisions are identified and discussed. For the farm-specific factors by which farmers can increase their profitability potential with better understanding, planning and negotiating, the analysis is extended to describe how each crop sector factors into this process.

5.3 Variables Impacting Farm-Level Marketing Decisions

Section 5.2 can be thought of as the left side considerations that sales are based on in Illustration 5.1, and the analysis below as the right side. Shifting the analysis from the marketplace to the farm, the variables specific to each farm operation are identified here in terms of how they affect marketing decisions. Rather providing a complex analysis of financial ratios or attempting to measure performance against a standard benchmark, the purpose here is to specify the internal variables which drive marketing decisions. This is

consistent with the objective identified to provide better information about 'what farmers are doing,' and to frame the ways that planning can improve a farm's odds of success.

Intuitively, we know that in practice the marketing-related influences on farmer profit-maximization stem from the following:

1. Which crops the farm is agronomically able to grow in a given marketing cycle and market demand at the time;
2. The time of year those crops are sold and how close to the top of the price range the farmer achieves; and
3. The cost to produce those crops and where the net weighted average overall price achieved lies in comparison to the breakeven price;

But at the same time, there are two major constraints a farmer must take into account in the marketing plan.

1. Storage constraints at harvest and quality risk in storage post-harvest; and
2. Cash flow requirements.

The top three factors together determine marketing success and farmer profitability, while the bottom two constraints limit farmers from selling at the best time according to market signals. The various market sectors send signals to growers constantly about which crops are in demand, their selling points, and their profit potential, while the bottom two constraints keep farmers from capitalizing on those opportunities and/or avoiding the price and financial risk inherent in that market information.

Note the key difference between the top three factors and the bottom two constraints: the former are largely outside the farmers' control, while it is possible to better understand, manage and plan with the latter, to the benefit of the farm. The nuances specific to each factor, in terms of managing the processes from a marketing and profit-maximization perspective, are described below beginning with the less controllable factors. Storage constraints and cash flow requirements have an impact on sales decisions; strategies with which farmers can manage them will be addressed in greater detail as well.

The production mix a farm starts the marketing process with involves some choice, but is also dependent on factors that lie outside the farm's control, namely the geographic region in which the farm is operating, and crop possibilities, given rotational considerations. For example, because growing wheat repeatedly on the same piece of land is not considered sound land management practice, it may not be feasible for the farm to plant it even in an extremely bullish market environment. Similarly, the fields may or may not be suitable to the crop most likely to turn a profit. For example, Kabuli chickpea production contracts are often priced far above the normal cost of production, but most western Canadian farmers aren't located in a region with the correct growing season to be covered by crop insurance. Similarly, the process of rotating crops on fields from one year to the next for agronomic reasons is basically random.

Price fluctuations over time during a farmer's marketing window affect selling decisions directly. In fact, one of the most common performance measures is to determine where in

the range the net weighted average price achieved falls. However, because the marketing window varies from farm to farm, and probably for each crop, there is no one fair benchmark. More importantly, in the time he or she has to decide, the farmer is inhibited when choosing the highest price because he or she does not know when markets are peaking. Even if that knowledge was available, the farmer's ability to respond to the opportunity to sell the whole crop at the highest price of the year may be constrained by some combination of the two constraints to farmer profit-maximization addressed below.

Cost of production per crop, while clearly important to profit maximization, is more of a qualification of each individual transaction than a factor to be managed in the marketing process. Prices can stay below the cost of production for long periods, which renders a strategy to sell as soon as a profit is available unrealistic (that said, profit potential should be affecting planting decisions). In practice, when prices are above the cost of production and rising, farmers must capture as much of the market as possible to make up for the inevitable situations of selling at a loss.

While it is true that markets are cyclical, the capacity to hold off sales until the inevitable turn higher may be limited for the farmer, especially across crop years. Furthermore, as the marketing window, rotation and production mix differ greatly from one farm to the next, every farm has its own unique cost structure. The precise breakeven price level of an operation is related to its length of time in business, debt, scale of operations, personal tastes in equipment and other infrastructure, access to labour, production practices, and other factors. If high cost of production is a limiting constraint to individual farm

profitability, it may simply reflect poor production management or issues related to but separable from marketing performance.

This is not to suggest that farmers must have the lowest costs possible in order to succeed in marketing. For example, organic farms face significantly higher costs of production than conventional farms, but in the marketplace premiums generally make up for this. Similar differences exist in many IP specialty-crop markets, and across different geographic regions of western Canada. The point is that production cost is a structural variable unique to each operation and as such, the way it affects marketing decisions cannot be generalized.

By contrast, farmers do have the ability to negotiate around the factors discussed below, to improve their marketing performance and profitability. As noted at the outset, in a perfect world markets would peak just when farmers need to sell but in reality, market price signals, whether efficiently or inefficiently delivered, are not positively correlated with the push of crops into the marketplace for farm-specific reasons. Optimizing revenue involves selling available crops at the highest possible price, in light of the farm's capacity to store crops, its need for cash flow and its own risk tolerance. After systematically reviewing how each constraint can be managed within the context of the three main types of crop markets identified above, this analysis offers a framework that illustrates how a marketing plan can limit the impact of each constraint on farmer profitability.

5.3.1 Storage Constraints

Storage is a significant capital investment for the majority of Prairie farms. In general, excess farm storage is rare. The storage constraint that farmers normally face in the attempt to optimize their profitability in grain farming is captured in the following equation.

Illustration 5.3: The Farm Storage Constraint

Total Volume of Crops – Total Storage Capacity ≥ 0
(adjusted by number of crop types and number of possible bin separations)

Where:

Total Volume of Crops = expected production in the growing season + inventories carried over from the previous year's crop;

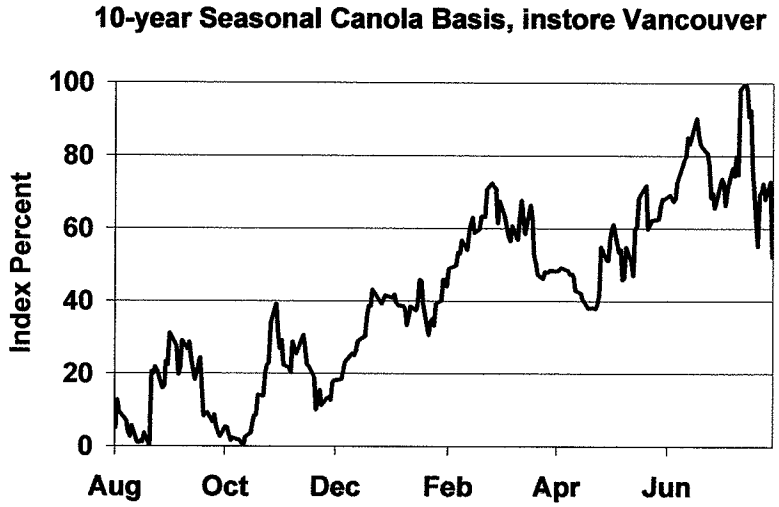
Total Storage Capacity = the total volume of bin space in which to store the crops; and

Adjustments to the surplus or shortfall to account for segregation of crops, as a result bins will not be filled to capacity; and, crops of high value or which are harvested in a non-storable condition require specific storage methods such as aeration to maintain quality.

When a shortage of space looms after adjustments are made, the farmer faces two storage-related risks. First, to deliver the excess crop directly off the combine to the elevator is likely to net a price near the low end of the year's range, as illustrated in Chart 5.1, which using 20 years of WCE Nov futures data, averaged, plots an index of price changes from 0 (lowest pt) to 100 (highest pt). Virtually all crops in western Canada, especially those that follow northern hemisphere production cycles, follow similar

patterns over the course of a normal marketing year. When supplies are highest, at harvest time, the basis is less attractive to farmers than in the following spring and summer, when supplies have been used up. This shows that better pricing opportunities can be expected in the spring versus the fall; the implication is that selling the expected surplus ahead of time and/or storing it for sale later on is advantageous in terms of the net price received for the crop.

Chart 5.1: Seasonal Basis Patterns in Canadian Canola



Source: Kostal Ag Consulting

Selling at the lowest-price window of the year is a classic example of a decision the farm is forced into due to its own constraints, rather than in response to market signals. Storing crops outdoors as an alternative can also be costly, particularly for higher-valued crops. In his July 1, 2006 weekly report, Greg Kostal of Kostal Ag Consulting estimates that "piling grain on the ground costs an estimated 10-20 cents/bu for any grain, just on loss

and double-movement," before possible quality discounts, or the post-harvest price being lower than the harvest-time price. Not all farms are constrained by storage, and some are only in years of above-normal yields and good harvest conditions. But even farms with ample storage that would not be forced to sell off the combine still face quality issues and the risk of costs due to downgrading in storage. There is also the risk that the price won't rise as expected.

The rationale for spreading delivery opportunities throughout the year to smooth pressure on the system and equalize movement across all farms is clearly part of the overall context of the CWB marketing system, which many believe collective benefits accrue from. But considering the portion of the western Canadian production mix that is Board grains and the normal 20% that is allowed to be delivered off the combine, it can be said that the storage burden on individual Prairie farms is heavy. Delayed delivery of the portion of crops that are grown under production contract terms adds to the problem. For example, some of the grain companies that handle Nexera canola only call for it in four lots, staged equally over the marketing year. This implies 75% of those tonnes are forced into storage and can't share space with the farm's conventional canola crop, in addition to 80% of Board grains and others with restricted delivery.

The most unfortunate aspect of forced sales at seasonally low prices, and/or introducing quality risk due to storage constraints is that it is not necessary. Once seeding is complete, growers can use normal yields to estimate the volume of production of each crop, and compare it to available bin space. If there is a shortfall, incremental forward

sales can be made accordingly as market signals arise, and throughout the growing season. In the vast majority of years, prices of most crops will rise in spring as in Chart 5.1, as the market attempts to 'buy in' enough acres to meet traditional demand requirements for the coming marketing year, or during the summer in response to the supply-threatening weather conditions. Selling in response to such signals is likely to net a higher price than what is available on the day a forced sale is delivered, because there is no correlation between an individual farm's cash flow needs and price trends in the markets for its crops. Similarly, the risk/reward aspects of storing crop in poor condition or outdoors beyond harvest is better made with the market outlook and the financial implications of the potential discounts having been taken into account, than simply because the last available bin filled up.

The fact that some farmers are not comfortable selling something that they don't have, i.e. are wary of contract buy-out risk, can also be managed in a number of ways. The most straightforward protection is through producing under a contract with an Act of God clause. In particular because the markets this protection most often comes with are highly volatile, the risk of forward selling too much before the quantity and quality of the crop is known is large, making potential contract cancellation fees high in the event of a widespread crop failure that also affects the over-contracted farmer.

Forward selling crops with a futures market can be done in a number of ways that does not involve contract buy-out risk. For example, selling futures with a stop set above the execution price, or the analogous buying put options, are both ways of guarding against

the price falling by the time the crop needs to be sold without taking on contract buy-out risk. Then, if the crop yields as expected and then is sold at a low price at harvest, there are profits on the paper side to offset the decline in value. Alternatively, a farmer can sell the crop and replace those sales with call options, which would rise in value if the futures price rises after the crop is sold. If this were to happen due to a weather problem that also put the farm in breach of contract, there would be profits in the option position to help pay the contract buy-out fees. Making a sale of the physical crop to protect against the price falling while also holding a long position in calls to protect against contract buy-out risk, or simply having sold too soon, doesn't require the farmer to have a brokerage account and trade through it: all western Canadian grain companies advertise a contract called the 'Minimum Price Contract' on canola, which includes the price of a call option in the basis, and establishes the identical risk profile as the exchange-based hedge examples above.

Likewise the Canadian Wheat Board offers the Early Payment Option, which fixes a minimum price against the current Pool Return Outlook (PRO) for a fee, generally believed to be a put option premium, which again protects the farm from the PRO dropping by the time it becomes the final payment but also leaving him or her open to capture future additional payments if the pool account value rises. Although, while the price risk parameters of this contract are similar to its non-Board counterparts, the Minimum Price Contract or broker-established futures hedge, it is important to note the significant differences in an individual farm's risk profile related to delivery being independent from pricing. The EPO does not work to transfer the storage risk of holding

wet grain at harvest while maintaining a long position in the marketplace, for example, nor does it allow the farm to sell and deliver more of the crop than the market might be signaling to in order to generate space or cash flow, without forfeiting future upside profit potential.

Returning to the Storage Constraint formula above, consider the impact of the delivery quota system on individual farm storage costs. The fact that 80% of milling wheat be stored in most years, unpaid for, introduces three types of costs: that of physical storage, interest and opportunity. It is safe to assume that over the years, in order to deal with the harvest-time delivery restrictions, many farms have invested in more storage than they would have felt necessary if the market would accept those crops according to the farm's own desire to deliver it.

The interest cost of delayed delivery and its limits on the farm to generate cash flow from its crops must be estimated and re-calculated regularly for an individual farm, but often comes in at around $8-12/tonne for a typical producer, illustrated as follows.

Illustration 5.4: The Interest Cost of CWB Pooling

Illustration 5.4: The Interest Cost of CWB Pooling

Interest Cost Calculation, for pooling CWB crops

Assumptions:
1. The farm has 1,000 tonnes of No. 1 CWRS 13.5% protein wheat to market through the CWB.
2. The farm uses a line of credit at an interest rate of 9%.
3. The farmgate price (instore August PRO less deductions) is $150 per tonne.
4. 25% calls are made in August and December, 15% in February and 35% in May.
5. The CWB called for 100% of the previous and present years' crop.
6. The final payment is issued in December one year following the harvest year.
7. Adjustments to the final payment are made at the same time as delivery calls.

Value of Wheat Inventory		1000	$150	$150,000	
Interest @	9%	(tonnes)	(price)	(value)	
	August	December	March	May	
Delivery Call	25%	25%	15%	35%	
Total Delivered (tonnes)	250	500	650	1000	
Volume on Farm (tonnes)	750	500	350	0	
Initial as % PRO	60%	70%	80%	90%	
Payment on Delivery ($/t)	$90	$105	$120	$135	
Unpaid Value of Stored Crop ($/t)	$60	$45	$30	$15	
Months to Finance	16	12	9	7	
Cost to Finance Top-Up on Deliveries	$ 717.30	$ 605.36	$ 262.46	$ 78.75	
financing exp final-initial					
Cost of Financing Undelivered	$ 4,050.00	$ 1,569.38	$ 157.50	$ -	**GRAND**
Total Financing Cost	$ 4,767.30	$ 2,174.74	$ 419.96	$ 78.75	**TOTAL:**
Per-tonne cost	$ 4.77	$ 2.17	$ 0.42	$ 0.08	**$ 7.44**

Again, it is important to recognize that this illustration only provides the framework for an individual farm to calculate the actual interest cost it is facing at a particular point in time, and to make the point that interest is a real cost that can and should be taken into account in making all forms of marketing decisions. For example, the interest cost advantage of the CWB's the early payment allowance under the EPO can be compared and contrasted to the cost associated with it, i.e. the 'discount' in deciding if and when to take it out at a particular point in time.

The opportunity cost of restricted delivery is impossible to measure, because it would require knowing what the farm would have done if it had not been constrained on storage.

In other words, having to fill bins with unpriced Board grains can mean having to sell earlier than otherwise other crops whose prices may be on the rise. The farmer forfeits the ability to profit from higher prices of non-Board grains by virtue of having to use up a portion of available storage under regulation.

The above scenarios are all simply meant to illustrate the signals growers can take from the markets in dealing with their storage constraints. Whether capacity or quality-related, the ability to maintain a long position in the market other than through holding physical inventories must be taken into account in making the sell/store decisions at harvest time. As noted in section 5.2.2, carrying charges can be used in planning sales of crops with a futures market in that if the deferred contract months are trading at less than the spot month, the market is said to be inverted and will not pay the seller to store the crop until later on. If the market is trading at 'full carry', i.e. the deferred month is higher than the spot month by the interest and storage costs to carry the crop forward, the market is signaling that it will pay the farmer to wait with sales. In crops without futures, some production contracts pay premiums for delivery later in the marketing year which can be measured against the exact interest cost of carrying related to the farm. In the case of Board grains, if the non-Board market was paying a similar price for 'feed' wheat than the CWB's expected return, a grower can make a more accurate comparison of the two options by including the interest cost of waiting for payment.

Finally, consider again the difference between the theory of revenue maximization versus profit maximization and the absolute rather than relative fundamental analysis that is

involved in each respectively, as explained in Chapter 4. Through their own research or by purchasing the advice of a professional outside market analyst, the sell/store decision made in the face of a constraint is best made based on the relative market outlooks for the particular crops in the mix. Whichever one is expected to rise by the least is likely to return the most on the investment made to store it, whereas the one with the greatest downside price risk is likely to end up costing the most to store. In cases, this perspective may not be in line with the revenue-maximizing issues that underlie the delivery quota system.

5.3.2 Cash Flow Requirements

Similar to the case of selling to free up storage space, marketing crops just because the farm needs cash often leads to sales having to be made at inopportune times. Also like the storage constraint, cash flow requirements are somewhat plan-able making it an unfortunate occurrence when a producer ends up having to disregard market signals out of a need to pay the bills.

One could argue that the various cash advance programs farmers have access to, by virtue of extending funds to farmers who need cash and wish to wait with sales until prices improve, allow them to work around this constraint and better respond to market signals, as they are designed to. But cash advance receivables have a way of catching up with farmers, who are at risk of using them to avoid making a tough decision to sell a crop at a poor price that is only getting poorer. And by virtue of the fact they encourage sales to be

planned forward without regard to short-term cash flow needs, farmers are allowed to ignore the past, and the fact they let the bills stack up without a revenue plan in place. If executing a forward sales plan is what the cash advance is meant for, why not back up the process a year or two to avoid the need for credit in the first place? Also, cash advance programs inherently assume, and extend credit, based on farmers being correct in their forecast that prices will rise. But while many engage professional market analysts and/or conduct their own in-depth research and/or by luck of the draw may be right, underlying the program is an easy way to avoid responsible cash flow management by the farm itself, which over time erodes the viability of the business.

Cash flow planning is not difficult, but it does require a perpendicular shift in thinking about how to market crops from the more common perspective of 'is the price as high as it's going to be' or 'does it represent a profit to my operation.' Herein lies a classic example of the conundrum facing farmers described in Illustration 5.2 above, that this type of vertical and horizontal thinking needs to happen hand in hand, both in the face of immediate marketing decisions and through the course of long-term planning.

Similar to how the cash advance program allows farmers to avoid the firm-level process of planning sales according to the market outlook and their future cash flow needs over time, the fact that farmers are allowed to file their tax returns using a 'cash' accounting system discourages them from considering if a price represents a margin over costs. While perhaps more consistent with the cash flow planning process encouraged above, the allowance does a disservice to the other issues in marketing.

According to farm accountants consulted on this question, farms are one of the only businesses that are allowed to account using the cash accounting method in Canada; all others are required to account using the accrual method. The main difference between the two types is that at year end, cash accounting looks at when cash went out, and when cash came in. If the expense is dated within the company's fiscal year, it is considered an expense. The same applies with income. This occurs regardless of where the expenses are incurred, or which production cycle they are "accrued" to, meaning they are not aligned with a specific year's crop.

For example, under cash accounting if a farm buys $30,000 worth of fertilizer in December 2006 for applying to the following year's crop, that expense is counted in 2006. In accrual accounting, that would be treated as a "pre-paid expense" and carried forward into the new tax year. In the same way, if a producer sold grain off the combine but deferred payment until January, cash accounting would not show the revenue in 2006, but in 2007. Accrual accounting assigns those revenues to the appropriate crop by listing it as "accounts receivable" in 2006.

It's easy to see why farmers use the ability to defer payments on their production until the new fiscal year, and make large purchases at fiscal year-end to offset income and avoid paying large sums in income tax. What generally happens is that near year end, a farmer is doing the books and will show an income of $100,000 in his year. At the tax rate of around 35%, the farm would owe the government $35,000. So the farmer decides to

spend almost all of his income on inputs for the next year (seed, fertilizer, chemical), to reduce the farm's income below the taxable rate and avoid paying the government – this year. Now, this farm has spent money on a crop it has yet to grow, and may not sell until the following fiscal year. If December is this farm's year end, they potentially have purchases made in 2006 for a crop grown in 2007 that may not be sold until 2008.

A key difference between cash accounting and cash flow planning process is that cash accounting is backwards-looking whereas the value in cash flow planning is forward-looking. More importantly, cash accounting makes it very difficult for farms to get a real understanding of what it costs for them to grow a crop, which is a problem in marketing because the ability to determine the break-even cost is absolutely critical to selling at a profit. Accrual accounting makes this possible by matching up, or accruing, all expenses and income to the particular year's crop that is grown, so that no matter when sales are made or expenses incurred, the books apply the exchange of funds back to the crop grown that year, making it easy to see how much it cost to grow the crop versus what it was worth in the marketplace. In marketing, the value of the crop in a particular market less the costs to prepare it accordingly is the central decision-making factor at play; that farmers do not consider each transaction in the same context is inconsistent with other agents in the marketplace.

It is interesting to note that many western Canadian farmers are well on their way to developing two sets of books, cash accounting for tax purposes, and accrual accounting (which are hopefully being used for marketing management and profitability analysis)

because the CAIS program requires accrual accounting in calculating payouts. Thus far, most farms have their accountants convert their 'cash' books to an 'accrual' statement for submission to CAIS, making it a minor next step to adjust the calculations for future management and marketing decision-making purposes.

However, if Tiegers' personality research is true, and a majority of farmers are 'sensors', preparing a separate set of farm financial statements in order to make better marketing decisions would be considered a painful exercise. Likewise, cash flow planning – which simply involves tallying up all the bills in the coming months and forecasting which crops might see good marketing opportunities during that time, and ensuring that at realistic prices enough funds will flow into the business as out – is not a common practice. Unfortunately, the processes both struggle to take hold as standard practices of good business management in the farm community due to high-level government-backed programs geared towards the collective rather than the individual.

To further illustrate how important an individualized approach to marketing is for a Prairie farm in terms of its ability to maximize profits, consider the notion of its marketing window. Marketing window refers to the time frame over which the farmer is deliberating about, and making, sales of a particular year's crop. Sales of two or more years' crops may overlap, but will not be the same, nor will the marketing window of any one farm be the same as another. As noted in the discussion above about how to deal with storage constraints, some farmers forward contract their crops in the spring extensively while others are afraid to sell something they don't have. Some farmers start marketing

increments of the coming year's crop in the fall as soon as they decide to plant it and don't finish selling until the following spring; others let it go all at once.

As it relates to cash flow, some farmers have no choice but to sell the whole crop within a couple of months of harvest, because their creditors will not wait any longer for payment. The ideal marketing strategy for such a farm will be very different than the cash-rich neighbor who may be able to wait years before selling. In particular for farms that don't hedge, or that grow a high portion of specialty crops whose prices can stay low for long periods before spiking higher above the cost of production, a short marketing window significantly limits profitability potential.

An interesting feature of the AgMAS program undertaken in the U.S. is the market benchmarks used in the evaluation of market advisory services, of a 20 or 24-month average price offered by the market in the marketing window starting in September or January of the harvest year and finishing one year after harvest. Anecdotal reports from accountants, cash advance program administrators and farmers themselves suggest that a great many in western Canada would consider such a long window in which to choose a price to sell at a luxury in marketing. The mere notion of a standard marketing window for all farms does not apply here, and in the interests of good business management, each farm needs to identify and state its own reality in this environment. Especially considering the volatility, variability and complexities when it comes time to approach the task of selling in the various markets, framing the window in which the farm is going to choose the price becomes a pivotal consideration in the question of maximizing profits.

Otherwise, the effects of marketing crops to service cash flow requirements are analogous to that of being constrained on storage in fall. When sales are made for reasons internal to the farm rather than in response to market signals, in this case to service short-term receivables, the outcome is less likely to be optimal. The particular cropping mix a farm has available to sell can help ease the negative effects if risk management tools such as hedging are available, or hinder it if delivery and payment terms are restrictive. Finally, a shorter marketing window, just like a bigger shortfall in storage, will have a more significantly negative impact on the pricing possibilities and profit potential of the operation.

5.4 Bridging the Two Worlds via a Marketing Plan

The essence of marketing planning is to give farmers what is referred to by grain traders as 'tight hands'. In trade-speak, farmers are often referred to as the weak longs, or those who will be first forced to sell out their positions when the market moves against them, due to fear, lack of discipline or conviction in their market opinion, or an inability to finance the problem of holding a position in which the market is creating losses. Through marketing planning, a grower identifies constraints, and plans around them. Costs are analyzed in detail and regularly updated, such that the seller always knows what price must come available for sales to represent a profit. The outer market outlook is overlaid with these inner financial considerations in formulating realistic targets and accurate

expectations during a marketing window, for a specific year's crop, and the tools available are utilized to gain flexibility in positioning.

This approach also recognizes that both farmers and their next-use markets are looking out for their own interests. Just as an organization will not pay farmers more than the value their crop is currently at in the markets, farmers do not want to sell below their costs. If they do, financial obligations stack up, the farm struggles financially and none of its supply chain 'partners' come to its aid. Despite the claims of many public and private organizations who suggest through their promotional material otherwise, there is a strong case to be made that farmers develop greater awareness and expertise in the pricing and marketing of their crops. This is equally important for all three categories of crops earlier identified: those with futures, those without, and those marketed by the CWB.

With storage and cash flow plans complete, farmers are armed with relevant information about when, where, how and why to respond to marketing opportunities an ongoing basis. A structured marketing plan contains information on all variables: production mix, its quality, the farm's ability to store and finance it (i.e. its marketing window) and the likely timing of sales given the current market outlook. By definition, a written business marketing plan is a foundation for ongoing sales decisions for stated, logical, structural, financial reasons. Deciding without a plan if, when, how or where to sell crops introduces another highly important but again unquantifiable risk: emotion-based decisions that may not be consistent with market signals and long-term goals.

Emotional influences in farming may seem to fall outside the scope of this analysis, but it bears a brief discussion because of the potential for a disciplined plan-based approach to displace greed, fear, ego and pride in day-to-day decision-making. Tiegers' definition of the typical farmer personality type as a 'sensor' suggests heightened emotional responses and/or a shying away of money matters. As well, feelings about operating a family farms, the tradition of co-operatives and the polarity of the left and right in most agricultural circles all come into play.

To illustrate emotion in marketing decisions, consider a few examples. During times of chronically poor prices, farmers are afraid the price will not rise above their cost of production. Frequently, when a market is bottoming, the news is bearish; it seems hopeless that prices will recover before the end of the individual's marketing window. In the absence of personal research into the market's true potential and an understanding of the cyclical nature of markets, farmers become vulnerable to selling out of fear, especially if there is heightened financial pressure due to cash flow mismanagement.

When the market then rebounds, especially if the grower is unaware of his or her cost of production, greed encourages farmers to hold off selling with the expectation that prices will move higher yet, which may conflict with market signals. If the price subsequently drops, a farmer's ego can play into the equation, influencing him again not to sell out of disappointment that when the price was higher, he didn't make a sale. If peers report having sold at the previously higher price, or if the farmer was advised to sell and didn't, the ego effect becomes even stronger.

These examples illustrate how greed, fear and ego can cause a farmer to make poor marketing decisions in response to price changes over time. Pride tends to negatively influence farmers from pursuing the best possible price on any given day, which may be a net result of the significant promotional investments made by grain companies and the CWB. An elevator agent, under the auspices of being the farmer's partner, can convince decision-makers that selling crops through his or her particular facility will net the highest possible price. Yet due to the wide range in bids, the fewer inquiries a farmer makes for pricing at the time of sale, the more money is left on the table. Similarly, the CWB works hard to instill farmers with a sense of pride about the quality of their crops: consider individuals named as 'Master Growers' of durum wheat and malting barley. Regularly in the marketplace, non-Board feed buyers of wheat and barley offer prices above CWB returns that a pride-based decision-maker may ignore because of the sense of importance that stems from the notion of growing crops for pasta or beer. In both cases, the relationship the organization cultivates with the farmer can end up steering him or her away from maximizing profitability.

Entrenched attitudes regarding pooling and competition in the various markets for Board grains will require further substantiation of the above claim, if it is to be used as intended to improve farmers' decision-making ability. Take for example the spread between the malt and feed barley price at the time of writing in August, 2006: a typical non-Board Lethbridge barley basis is $10/t under, reflecting the cost to deliver against the futures contract in the par delivery region, putting the southern Alberta barley price at about

$116/t for October delivery. The August PRO malting barley values ranged from $113-124/tonne at the farmgate, using the CWB's average deductions for the province of Alberta. Especially once the interest costs of pooling, the risk of stored malt barley not ending up being selected and the opportunity cost of lost storage space are factored in, growers were facing a clearly less-than-optimal proposition in saving their barley for malt rather than marketing it through into the domestic feed market.

Emotion can also factor negatively in marketing decisions through 'trade bias.' Farmers are almost perpetually sellers in the market, i.e. 'long' the commodity in question, which means they profit when the price moves higher. This creates a bias, the habit of only taking into account bullish news in the marketplace, and disregarding, justifying or ignoring bearish market signals.

Whether it is greed, fear, ego, pride or trade bias, there is less room in the decision-making process for emotion when cash flow needs, storage constraints and breakeven price levels are considered. Thus in addition to specifying the farm's own unique production mix, quality-related risk, marketing window, realistic targets and sales strategies based on the market outlook, a marketing plan instills discipline that can displace potentially damaging non-market-related influences.

In summary, there are a myriad of complexities simultaneously at play between farmers and their next-use markets. The static and dynamic considerations that factor into what is the optimal decision do not converge into a perfect result. Yet by stating, quantifying and

tracking the various factors, a farmer can merge the two worlds of marketing into the best decision-making framework for his or her own circumstances.

Chapter 6: Conclusion and Findings

Farmers in the Prairie crop supply chain have a huge incentive, and for most a significant opportunity, to increase the profitability of their farms through better marketing. Farming systems have changed, production choice has expanded, the buyer network has been transformed, policies are changing and accounting systems are in many cases outdated. In the process of focusing on becoming more profitable through improved marketing planning and strategizing, farmers can also expect to gain greater control over their financial future, and in the process, strengthen their position in the marketplace for the future.

To this end, an important hurdle is to move beyond the standard practices of farm finances, and see beyond the efforts of public and private organizations involved in buying and marketing Prairie crops. Understanding and monitoring the available mechanisms, considering what can be done with them to maximize profit, and keeping on top of what it means to the farm's profitability and long-term viability, are far more important than the politics and philosophy that can otherwise consume deliberations on the future of Prairie agriculture. In the absence of a government program that guarantees success, farmers risk losing their livelihoods by disregarding ways to improve their financial position. Largely, marketing planning is about obtaining the highest price possible for a particular operation.

Efficient market theory would suggest the best forecast of the price in the future is the price today, or the relevant futures contract price. Crops with a futures market, but not well-correlated to cash prices in western Canada, can introduce more damage than good because growers trained in hedging may attempt to use the futures for risk management and end up adding more risk to their operations than they take away in the process. Marketing through the CWB presents a similar challenge: while the alternative pricing mechanisms may sound like privately-traded contracting mechanisms, applying non-Board analytical techniques won't work the same way in an environment of mandatory pooling. Production contracts in some pulse and specialty crop markets with profitable prices and an Act of God clause help farmers manage risk a great deal in some years, for some crops, but are increasingly rare.

Clearly, the farmer is left to his or her own devices to manage the marketing process to achieve maximum profitability, based on the particular 'portfolio' of crops for sale of Board grains, crops with futures and crops without, taking into account the varying effectiveness of the risk management tools in each sector. The three attributes of markets that can aid planning and decision-making, price risk management, the transference of value signals, and profit potential perform in different ways in each crop sector, and will be valued differently by each individual decision-maker based on their personality.

Findings

1. It stands to reason that the guidelines and framework developed in this study should increase a farmer's chance of marketing success, but comparative analysis is challenging. From the point that a disciplined, planned approach is applied, who knows what the farm would have done without it? A possible method would be for an outside source to gather together all of the necessary information about production, quality, cash flow, storage, business style and marketing habits and spend a marketing window developing a plan and undertaking the recommendations on a virtual basis. During the marketing window farm managers would maintain regular contact with the outside marketer regarding changes in quality, opportunities being presented, etc., then the results of the planned approach could be compared to the traditional approach.
2. Throughout this research, the problem of static price variability, or a wide range between the lowest and highest bids to farmers for the same quality of crop in the same region on the same day, has come up repeatedly as it pertains to a farmer's chance of marketing success in western Canada, through added workload to find the best price, and difficulty in planning and executing a marketing strategy related to unclear valuation of the crop. The basis volatility in feed wheat illustrated above, the loss of the flax futures market, the failed launch of peas and other commodities over the past 12 years suggest that western Canadian crop markets are not open or liquid enough to meet the standard criteria for market

efficiency, a claim that might be tested against the corporate consolidation that took place throughout the 1990's.

3. In the past, and outside western Canada, the focus of farm marketing education has been systems such as hedging and price pooling, but this analysis illustrates that any and all supposed standardized, one-size-fits-all marketing solutions don't work to manage whole-farm risk for an individual operator. Efforts to maximize revenues, by the individual or on the whole, will not result in the same marketing activities as maximizing individual profitability, which is based more on *relative* price potential than capturing the absolute high.
4. Creating an accrual set of financial statements for some farmers will seem easy compared to shifting the mindset from achieving the highest price of the year to analyzing the relative price potential in the various markets for their crops. This research suggests a major contribution to western Canadian agriculture of the CAIS program will be its non-acceptance of cash accounting statements from applicant farms, because from a marketing perspective, some of the most relevant information in day-to-day decisions, such as the farm's breakeven price, can only be gleaned from a form of accrual statements.
5. Understanding and monitoring costs is also likely to improve the overall perspective of farmer marketers towards their buyers as well. Since no company or organization will ever willingly pay a farmer more for their crop than it is worth, perhaps the opposite could be attempted by some farmers, or by all in certain stages of the marketing process: not to grow the crop unless both a

potential profit and low contracting risk are apparent; and/or not to sell until a profitable price comes available.

6. A disciplined plan that takes into account the unique needs of an individual farm, its own specific constraints and goals, and a realistic sales strategy also slows emotional influences, so they cannot damage profitability potential through bias or the temptation to ignore market signals. For some, simply acknowledging these effects will mark an important first step in removing greed, fear, ego, pride, trade bias, etc. from the decision-making process.

Within the context of a structured, disciplined plan, emotion and risk tolerance can provide concrete signals as well as valuable gut instincts about *when* to sell, help build alliances to create better opportunities regarding *where* the crop should be sold, and fuel a manager's knowledge of and comfort level with the various marketing tools to determine *how* it is sold. In the end, only the individual can determine whether he or she is satisfied with the reasons *why* a transaction took place, no matter what the outcome. The process can be helped along by outside professionals, but clearly requires significant input from farmers themselves.

In closing, it should now be clear that claims that 'farmers are poor marketers' miss the mark, especially considering these statements are most often made following a sharp move in prices, when a farmer sells too much, too soon; or not enough, too late. Perhaps farmers make the decisions they do due to lack of knowledge or poor forecasting, but

underneath the surface there are other strategic influences at play. The purpose of this analysis has been to assess the marketing process, define the decision-making parameters and identify the areas that farmers find difficult to manage that through exploration and better understanding, may be planned around.

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