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Kay / Please note in dept weekly memo

DRAFT: NOTES FOR A PANEL PRESENTATION, DAUPHIN AGRICULTURAL SOCIETY, FEBRUARY 2,1990--"WILL THE FAMILY FARM SURVIVE?"

J.A. MacMillan, Department of Agricultural Economics, University of Manitoba

Definition: in a family farm decisions are made by family members whether in an unincorporated, incorporated, or partnership business unit on a either a full-time or partime basis. There can be little doubt that the family farm will survive but the total number of farm family units will continue to decrease. A critical issue is the recognition of key factors causing dynamic changes in operations of surviving family farm units.

Rod Fisher suggested that I initially focus on the negative factors underlying this question. The list of negative factors appears truly formidable. For purposes of discussion I have grouped factors under major topic headings and will discuss the negative perspective first.

1) INCREASING SHORT-TERM PRICE VOLATILITY

-FARM PRODUCT AND INPUT PRICES, INTERNATIONAL COMPETITION, CLIMATE CHANGE

2) LONG TERM TREND TO LARGER FARM UNITS

-TECHNICAL CHANGE AND RESEARCH, PUSH AND PULL OF RURAL DEVELOPMENT PROCESSES

3) STRATEGIC MARKET AND PRODUCTION PLANNING FOR SURVIVAL

NEGATIVE FACTORS:

1) Income Forecasts--Agriculture Canada recently forecast a disastrous decline in net farm income for Manitoba of -78%

--product prices currently inadequate for survival for many farm enterprises: wheat, hogs, and cattle finishing

2) Financial Viability--The Economic Council of Canada in a recent study by L. Auer (p. 31) estimates that 57% of Manitoba farms were vulnerable, deteriorating or nonviable with respect to financial status in 1987 without WGSA and SCGP and
that 33% were in the same categories even with WGSA and SCGP government payments.

-- Of particular relevance, is the estimate that in 1987 36% of Manitoba's financially nonviable farms were located in the Parkland Region

--Interest rates are rising and the Farm Credit Corporation is no longer subsidizing farm loans; the FCC 5 year farm mortgage loan rate has increased to 12.25% for 1990

3) International Competition--In a study, World Agricultural Changes: Implications for Canada, by J.C. Gilson (p.193) it is observed that "...complete liberalization of world agricultural trade will lead to a general reduction in the general welfare of agricultural producers, and to an increase in the overall national economic welfare of food consumers and taxpayers."

4) Climate change--In a study sponsored by Environment Canada by L. Arthur (p.10) of the impacts of climate change on Prairie Region agriculture it is concluded that, "The initial response to expectations of global warming is that agricultural patterns will change dramatically, and that the prairie regions could suffer substantial crop losses."

-- It is concluded in a U of Manitoba, Dept of Ag. Econ. study of Manitoba Farm Financial Problems and Mobility, 1985 by VanKoughnet, MacMillan and Kolody (p. vii) that "Drought and crop failure received the highest rank as a factor causing failure".

5)Technical Change and Research--L. Auer projects that technical and structural change in the Prairie region will result in an increase in the volume of output of 40% between now and the year 2000 which will cause: a decrease in farm numbers of -15%, most of the drop is expected in the group of full-time farmers with the number of part-time and corporate farmers increasing The average farm size in the Prairie region is expected to rise from 950 to 1150 acres

6) Rural-Urban Regional Development--The 1976-86 year population growth rate for the Parkland Region has been negative: Census Division 16 (-.3%), Census Division 17 (-3%) and Census Division 20 (-5.9%), Canadian Markets,1986, The Financial Post, p. 453. A comparison of Parkland manufacturing jobs was estimated at 746 in 1971 in our Parklands Region Employment Study versus the Financial Post 1983 number of 426 which indicates a substantial decline in manufacturing jobs in the region.

POSITIVE FACTORS

1) Income Forecasts--Alberta Pool Budget, Dec 22, 1989 notes that the Agriculture Canada forecasts of net income declines are speculative because government payments may not decline to the extent assumed and the United States Department of Agriculture recently reported that the global wheat stocks/use ratio is at the lowest point since the 1970s. Greater than expected demand or problems with next years crop could cause sharp price rises in 1990.

Volatility in agricultural prices appears to be increasing (See price charts for cattle, hogs, and crops). Breakeven analysis is a very useful planning tool to analyze expected variations in prices (See Appendix 1 summary of Market Oriented Decision Making Model results for crops and feeder cattle). The MODEMM scenarios require 15 minutes per run when all the information is available. Similar information can be obtained by running alternative scenarios using the Manitoba Department of Agriculture, Farm Management cost of production estimates (See Appendix 2).

--at current prices Parkland cow-calf producers can likely make positive net returns to labour and management

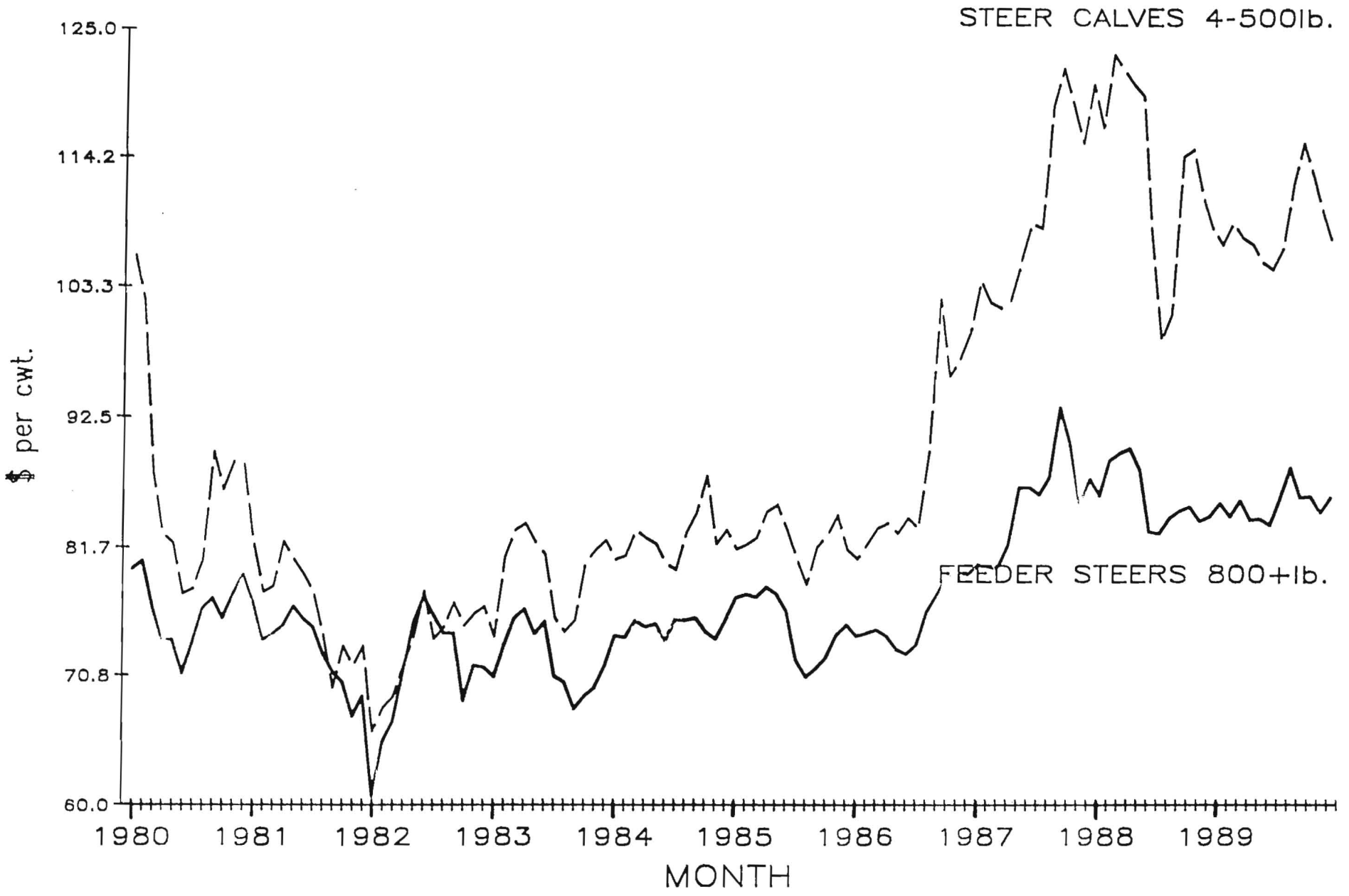
--Parkland Canola producers had gross margins among the highest in the Prairie region in 1987, giving a gross margin equal to revenue less variable costs per acre of $103 per acre in Crop District 4, $59 per acre in Crop District 5 and $88 in Crop District 6 according to tabulations of Canola Council data collected under the Canola Management program

--Parkland wheat producers crop club data indicate high net returns per acre for 1 year at $50 per acre in 1988 and low net returns at -12$ per acre in 1986 for an average of $2.50 per acre over the 1986-89 period (K. Watson, Dauphin Crop Management Club, Agro-Forum, 1989, p71)

--Fertilizer prices are at record low levels; a price of 10 cents per pound of N paid for anhydrous ammonia for fall applications has been reported and indicates a potential for high net returns for high levels of N fertilizer application. Farmers need to carefully monitor fertilizer prices to minimize fertilizer costs. The farm cost of N appears to be in a long term decline.

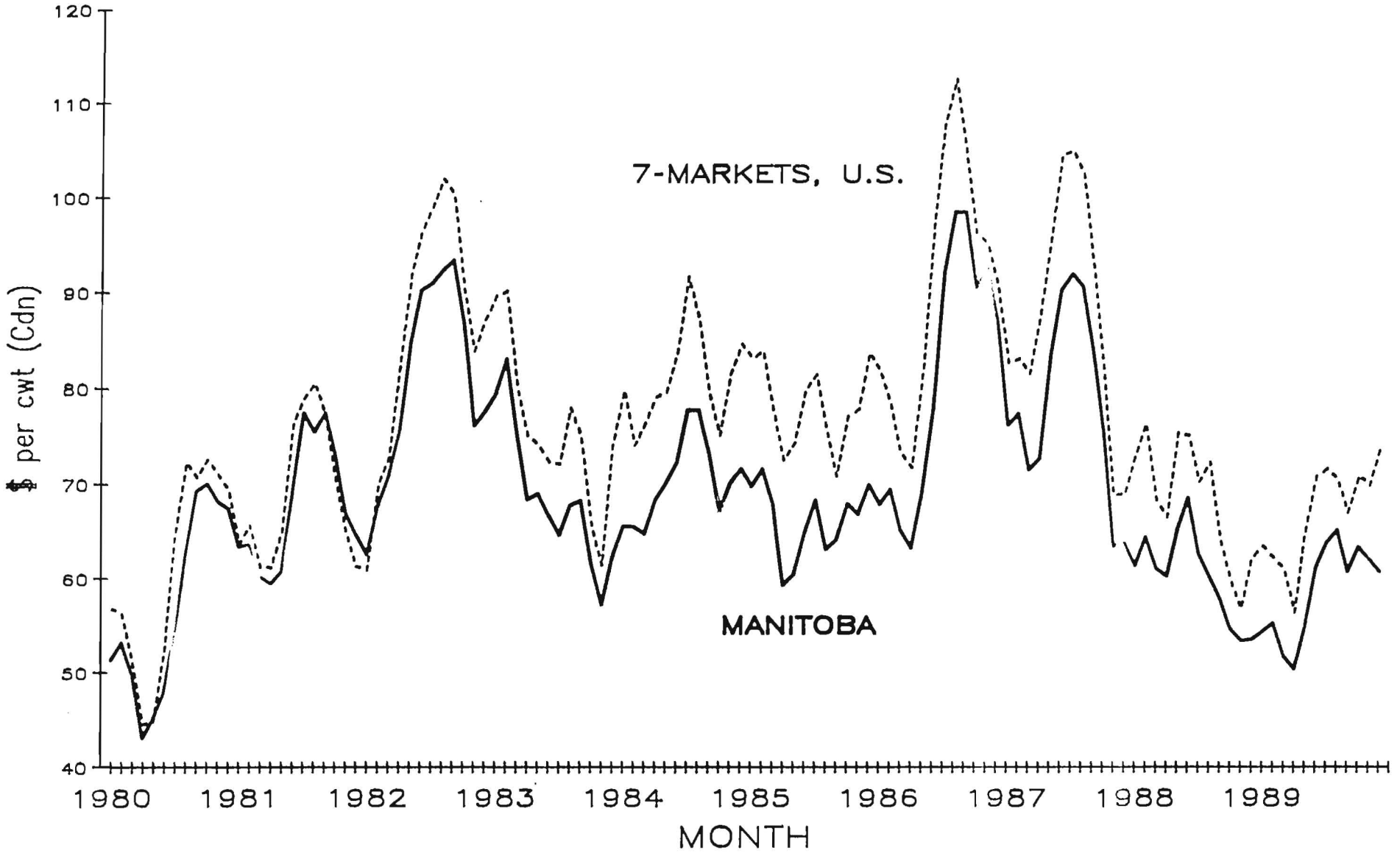
--Survival should be possible with low debt, appropriate production management and participation in commodity stabilization and crop insurance programs for Parkland farmers to earn a "reasonable" level

WINNIPEG CATTLE PRICES BY MONTH
1980-1989



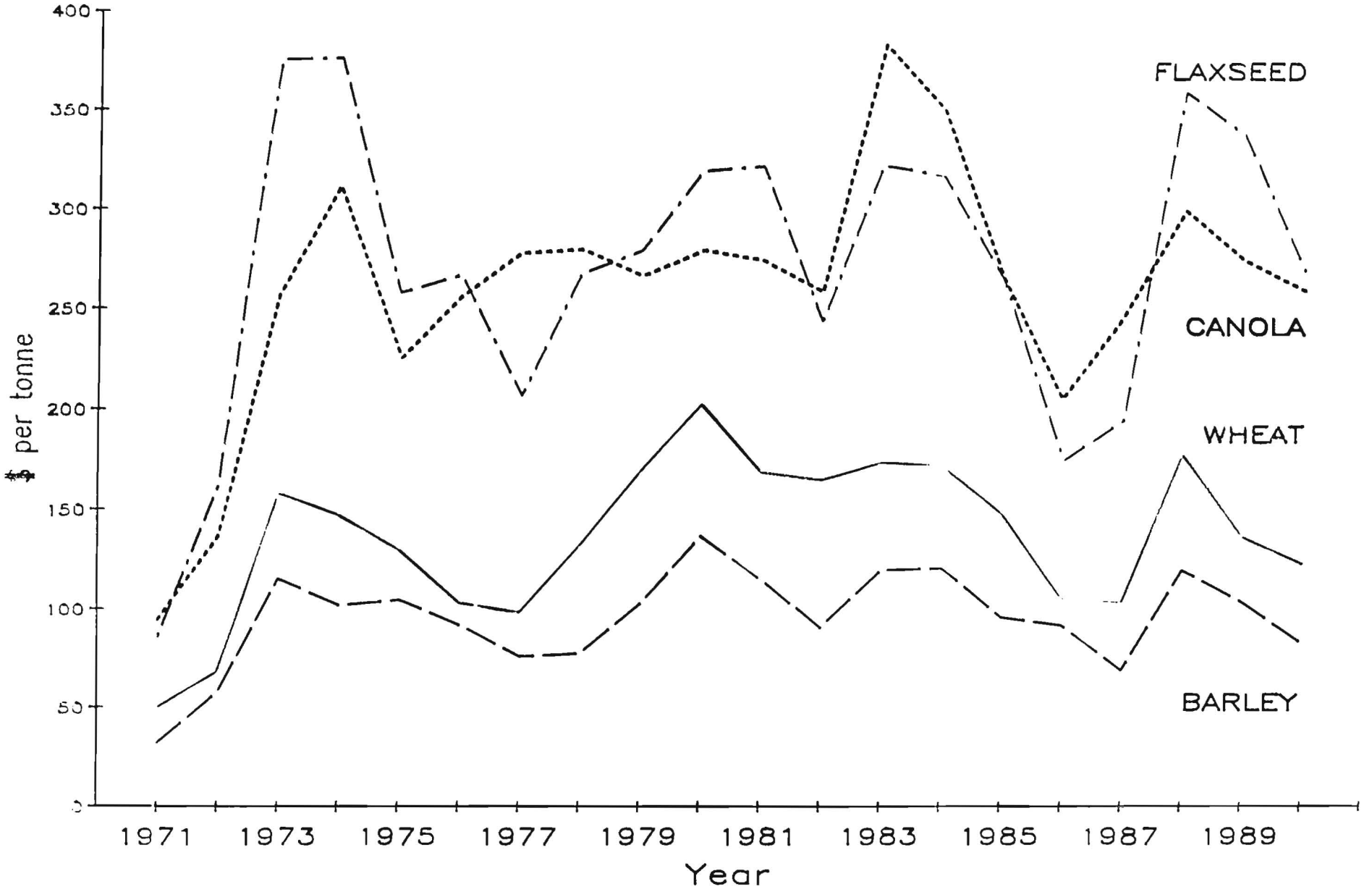
Datasource: Agriculture Canada

HOG PRICES BY MONTH, 1980-89
Index 100 dressed weight



Datasource: Agriculture Canada and U.S.D.A.

PRICES OF SELECTED CROPS, 1971-1990



Datasource: Manitoba Agriculture

of farm family income. Manitoba Crop Insurance programs are expected to increase levels of protection for crops and expand levels of protection for forage in the future

2) Financial Viability --In our 1985 survey of Manitoba Farm Financial Problems and Mobility, it was indicated by credit agents that less than 25 percent had adequate or better financial management skills (p. vii).

Similar conclusions have been made by policymakers. Financial management training and computer assisted learning programs in marketing are being developed by the U of Manitoba Solomon Sinclair Farm Management Institute and Assiniboine Community College and "user friendly" micro-computer software is becoming available for use by farmers. The key challenge is for the family farm decisionmakers to use micro-computers to become more knowledgeable about details of farm operations and plan alternative production and marketing scenarios.

3) International Competition--Increasing market orientation is occurring in international trade. Analysis is required to assess the extent of competitive advantage held by Parkland farmers, particulary in wheat, canola, and cow-calf operations. Although some countries can obtain yields of 10 tonnes per hectare compared to 2.5 tonnes per hectare in the Parklands; it is likely that on a <u>without subsidy</u> basis that the cost of production per tonne in the Parklands is very competitive on an international basis.

--J. C. Gilson (p. 20) indicates that given increasing population and income in the world, trends indicate that an additional 10 million tonnes per year of Canadian cereal exports is feasible by the year 2000. This would result in total grain exports in 2000 greater than 40 million tonnes compared to exports of 32.4 million tonnes in 1986-87. The potential market for wheat in developing tropical countries is very large. Wheat is preferred as a convenience food in developing countries with rising incomes associated with reducing time in food preparation and as women's participation in the urban labour force increases (D. Byerlee and M.L. Morris, The Political Economy of Wheat Consumption and Production with Special Reference to Sub-Saharan Africa, p.372, in <u>Southern Africa: Food Security Policy Options</u>). There is a market of about 1 billion people in tropical developing countries between 23^0N and 23^0 S with a per capita wheat consumption of 25kg compared to 140kg in developing countries where wheat is a staple.

4) Climate Change--In contrast, to initial expectations it is concluded by L. Arthur that "...even with minor adjustments in seeding dates (primarily

earlier due to reduced frost risk) , crop selection and management techniques ... the losses can be attenuated or avoided entirely". In addition, most of the results point to positive increases.

--Prairie Care programs of Ducks Unlimited provide an opportunity for farmers to benefit from soil and water conservation proactices and zero tillage. The Parkland region has a head start in this regard with a low rate of summerfallow, high moisture and a large number of undrained potholes.

5) Technical Change and Research-- An alternative to fighting change is to ensure that Manitoba's farmers are on the leading edge and are able to capture the benefits of "early" adoption.

--Public investment in canola research generally and recently farmer investment in P. McVetty's U of Manitoba program of hybrid canola research by the Western Grains Research Foundation has demonstrated the potential for large returns to agricultural research. An increase in Canola yields of 20% are expected which would translate into a significant increase in the gross margin for Canola production in the Parkland region. Consistent with the results of the evaluation of the hybrid project by MacMillan, Kolody, Loyns and McVetty a need exists for increased emphasis by farmers on the financial returns to producers associated with alternative agricultural research project investments.

--Farmers can do a better job of getting governments and universities to focus agricultural research on projects of direct financial benefit to producers. Surveys by the University of Manitoba and the Manitoba Department of Agriculture have indicated the need for increasing research and extension information on fertilizer use, pesticide use, and variety selection decisions particularly with respect to regional variation, moisture, variety and soil type (See the following U of Man, Dept of Ag. Economics, extension bulletins: Zbeetnoff and Josephson, Information Needs in Choosing Fertilizer Rates, Zbeetnoff and Josephson, Information Needs in Selecting Crop Species and Varieties, and Zbeetnoff and Jeffrey, Crop Management Decision-making: Information Needs Used and Required by Manitoba Crop Producers).

--Plant breeding focuses on selecting the highest yielding wheat, canola, etc variety for Western Canada without varying fertilizer levels, moisture levels or considering any regional variability in soil capability and farmers in particular regions are left to guess as to the suitability of a variety for their area. No variety selection is based on minimizing fertilizer levels

6) Rural-Urban Regional Development--In contrast to the 1976-86 population decline for the Parkland region a small positive growth in population occurred for the the 1981-86 period.

--Economic analysis of factors leading to exit and entry of manufacturing activity in the region is required to assess the potential for industrial development activities (See J.A. MacMillan and E.A. Poyser, Rural/Urban Regional Development in Canada Innovative approaches include community co-operation in rural industrial development and integrated livestock and energy production (See Economic Evaluation Methodology for an Alberta Agro-energy Project, J.A. MacMillan, L.M. Arthur, and M. Smith, Canadian Journal of Ag Econ, 36 (1988), 905-13

7) Suggestions for Strategic Market and Production Planning for Farm Business Survival--Throughout the 1970's and early 1980's corporate planning and business development emphasized analysis of new markets, new production investments. Expansion was based on an increasing re-assessment of the market value of assets and expanding debt. The 1982 recession forced a short-term focus on cash generation, asset sales, cost reduction and debt repayment. Agribusiness management is now focussing on the impact of changing market conditions and production costs on the business cash position. A new statement has recently been added to many annual financial reports-a reconciliation of changes in net current assets and cash.

Businesses, farmers and urban homeowners were caught in the 1982 recession with loans often equal to 70% or more of the market value of assets. When the value of assets such as land and housing fell 50% such businesses, farmers and urban homeowners were technically bankrupt with a negative equity. Eight years later many family farms are still struggling to weather the financial stress of debts greater than assets and income often insufficient to pay the principal and interest owed to the lenders who financed the expansion which crashed in 1982. In contrast, many homeowners walked away from their houses and left mortgage companies to bear the losses and corporate farms and corporate business owners declared bankruptcy leaving lenders to bear the losses.

There is a striking similarity between the debt problems of many family farms and developing countries--both went into the 1982 recession with debt and both are still suffering with principal and interest payments

which cannot be covered by current income. Technically countries cannot go bankrupt. International lenders infrequently forgive debts of developing countries and commercial lenders infrequently forgive debts of farmers in financial difficulty. Developing countries and farm families with personal assets used as collateral do not have the benefit of limited liability of corporate business operations. From this perspective there is a high cost to unincorporated farm family businesses of overexpanding from one business cycle to the next which does not exist for incorporated farm operations.

Surviving farm businesses whether corporate or not will increase time spent on cash management. A minimum requirement is an annual forecast on a monthly basis of cash in and cash out, and monthly net cash balances. Farmers will shop around for the lowest cost operating monthly credit costs and the highest rate of return on positive cash balances. In periods of declining interest rates often associated with recessions loan costs can be reduced by short-term (6 month or 12 month) borrowing. In contrast in an expansionary phase of a business cycle loan costs can reduced by borrowing long term (5-10 years). For example, short-term demand loan rates peaked in the summer of 1981 at 22 percent which compares to interest rates below 10 percent in 1987 and current personal loan rates of 14.5%. Significant savings can be made by farmers who closely monitor and understand interest rate cycles. Surviving farmers will plan for income variability-- price and yield--and make contingency plans for periods of low income.

Family farms will survive but with changes. The critical factor underlying factor is that farm operations are characterized by diseconomies of management with increasing size. In the early 1970's governments were worried that large corporate farm organizations would take control of an increasing proportion of Manitoba's farm acreage. In the 1980's it was demonstrated in Manitoba that the large corporate organization could not operate large units as efficiently as the smaller family based units. Efficient farm management requires rapid decisions in response to dynamic changes in markets, crop production characteristics and climate. Large corporate organizations with a decentralized management decisionmaking structure are not capable of the required rapid changes in management decisions.

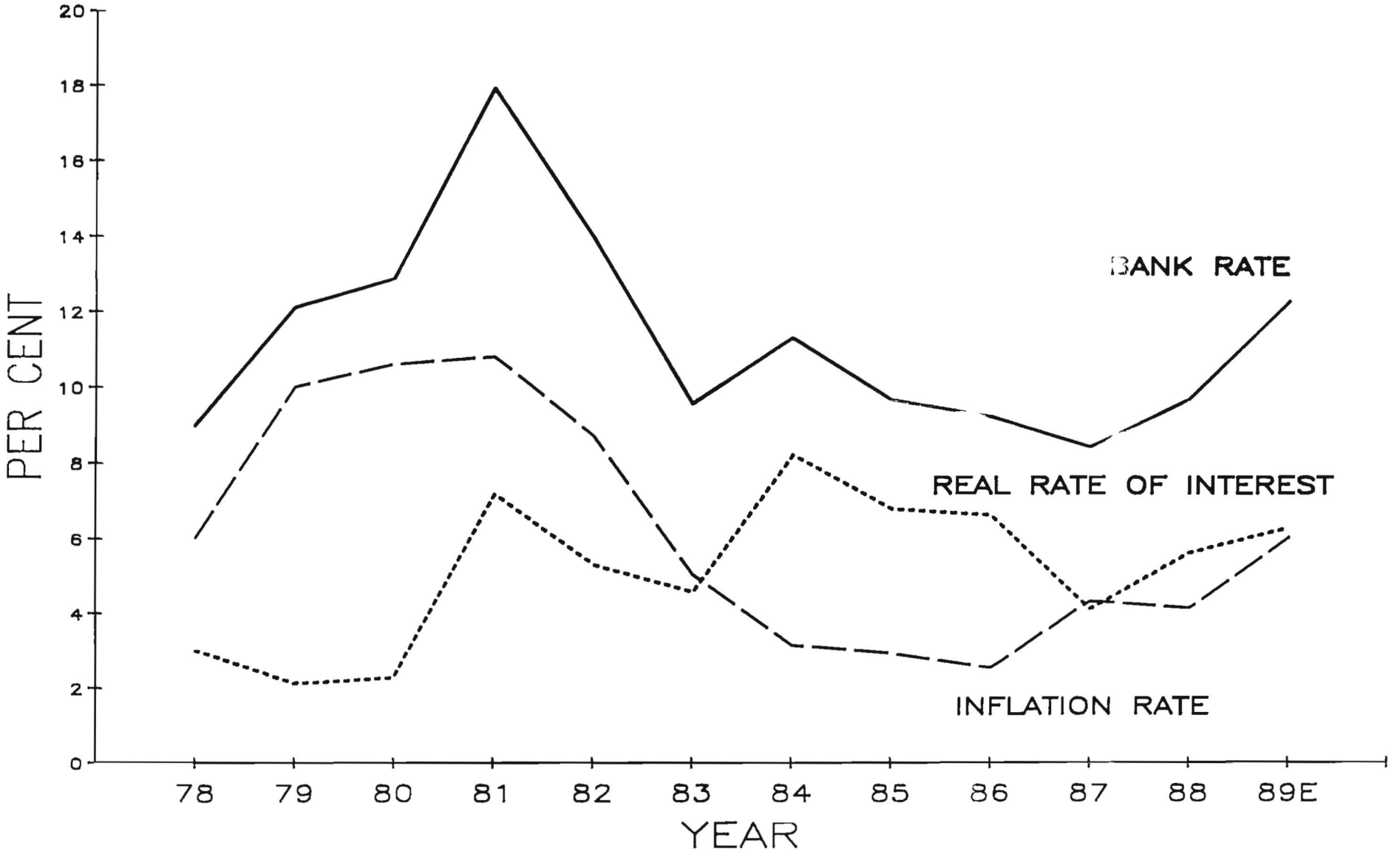
In short, farming is requires a "hands on" management decisionmaking. In an international context, this has been dramatically demonstrated by the phenomal growth in Communist China's agricultural productivity during the 1980s. This growth accompanied market oriented pricing reforms embodied in a "household responsibility" system which replaced the centralized pricing and management structure of state farms and communes (See International Association of Agricultural Economics, Symposium on Rural Development in China, p.). The family farm in Canada and Chinese farms run according to "household responsibility system" are both characterized by a decentralized entrepreneurial decisionmaking structure. The Chinese are now moving back to government control of prices and markets which will likely substantially reduce their agricultural productivity (D. Honeyman, draft thesis).

Surviving farmers will use more sophisticated business management information systems and will have to:

- know not guess at costs and returns
- incorporate general business cycle fluctations in prices and interest rates and commodity price cycles into farm expansion and contraction strategies for specific enterprises
- business survival in volatile markets requires continual break-even analysis on both on a cash (MODEMM) and a total cost basis (Manitoba Department of Agricultural, Farm Management, Enterprise Budgets)
- know marketing and production strategy options and have a plan
- carefully plan intergeneration transfers of assets and ownership structure to minimize family disputes

I would be interested in your vote as to whether or not the positive factors outweigh the negative factors affecting the survival of family farms in the Parkland region of Manitoba.

BANK RATE, INFLATION RATE, REAL RATE OF INTEREST 1978-1989



Datasource: Bank of Canada Review

APPENDIX I

Prepared by
Dr. R.M.A. Loyns

January 30, 1990

FOR ILLUSTRATIVE PURPOSES ONLY

The prices and costs used in these illustrations are "best guess" estimates as of this date. Individual producers using MODMM should use their own estimates.

USE OF MODMM FOR CROP PLANNING PURPOSES

The following crops are used for illustrative purposes:

1. #1 HP Wheat

   Budget $4.10/bus and 40 bus/ac because of high inputs (100 lbs N and 40 lbs P_2O_5). But cannot plan only #1 HP wheat, so average No. 1 and No. 2 HP

2. Ordinary Wheat 1 and 2

   Same yields but prices drop about 6%, budget $3.85 with 40 bus/ac. If excess rain,

3. #3 Wheat

   With prices down another 15%, and some yield loss.
   Budget $3.20 with 37 bus/ac

There are no land costs used, although these can be entered if the user wishes.
N is valued @ $0.18/lb and P_2O_5 @ $0.25/lb.

The Output (Net Returns)

Illustrate the results after costs are deducted (on a per acre basis) of each combination of price and yield. For example:

No. 1 HP	High	137.25	Low	-2.25
No. 1 and 2		112.25		-9.75
No. 3		58.75		-35.65

These three outcomes are typical possibilities from planting conventional wheat. They represent: (1) no rain at harvest; (2) small rain half-way through harvest; and (3) considerable rain during harvest. Otherwise good, but not excellent, growing conditions are assumed, while low yields reflect below average conditions.

Notice that the set of Net Returns for a particular crop, and Net Returns across crops, reflect the user's subjective assessment of risk. For example, by planting ordinary wheat the user is indicating the very best of price and weather conditions would generate $137.25, while the worst conditions would be -$35.65. He budgets $38.75 for #1 wheat, and -$6.85 for No. 3 (rain during harvest).

The price and yield forecasts come from the users own assessment of what prices and yields will be in his own case. In the end, for budgeting purposes, the producer has to decide. The advantage of MODMM is that a range (which is reality) is used, and therefore a range of results is generated.

The break-even prices and yields are calculated using variable costs only.

4. CPS Wheat

Represents the best guess at this stage of how the CWB contract wheats might perform. Notice the higher fertilizer and chemical cost associated with these wheats. Interestingly, these results compare favourably with ordinary wheat. This has been the case of these calculations throughout the 1980s.

5. Feed Barley/Malting Barley
and
6. Only two barley examples are presented, although a combination of the two should also be tested. The Malting barley price is lower than experienced in the last two years because the ability of the CWB to achieve the recent premium on Malting barley was drought related. Feed barley requires more inputs; should yield significantly higher and is less risky than Malt.

7., 8. Rapeseed
and
9. Four runs are done:

1) ordinary production management including seed treatment are high but limited fertilization (100 N, 20 P_2O_5). Please ignore the High and Medium prices on "Rapeseed No Treatment ..." They are different from other runs.
2) higher fertilizer (120/bu)
3) higher fertilizer, scerotinia control
4) ordinary production management, 50% hedged at current available prices

According to the yield and cost estimates used in these examples, the additional fertilizer appears to pay, as does the scerotinia control. However, the downside risk of the extra chemical application is larger. In other words, the yield boost from control appears to have to be greater than that used in order to justify the cost.

10. The Hedged Rapeseed

Example illustrates another use of MODMM. By forward selling, say 50% of production at today's futures price (for September delivery, estimating basis at that time) allows increasing the budgeted price slightly, and reduces the range of price estimates. Consequently, returns are also less variable. That is the primary reason for forward selling.

11. Flax

Flax is a low input crop, but at the prices used provides favourable returns. At these prices it provides topside opportunities equivalent to wheat and barley, and as good or better downside returns as any crop. Under current conditions, the futures market is providing opportunities for locking in better than $7.50/bu, consequently the budgeted price could be increased, perhaps to $7.25 by forward selling now.

Cost of Producing Grain Crops in Saskatchewan, 1989

Sample of Top Management Farmers

	Brown Soil Zone			Dark Brown Soil Zone			Black Soil Zone			Illustrative Red River Valley		
	Barley on Fallow	Barley on Stubble	Wheat on Stubble	Barley on Fallow	Canola on Fallow	Wheat on Stubble	Barley on Stubble	Canola on Fallow	Wheat on Stubble	Barley	Canola	Wheat
Yield (Bushel/Acre)	50	40	22	50	27	27	53	28	30	65	28	40
Av. Land Value/Acre	$274			$299			$312			$550		
% Cropped	70			71			80			100		
Seed	5.09	4.87	6.12	4.58	5.37	6.73	5.30	5.16	7.25	6.13	8.00	9.60
Fertilizer	5.46	9.03	11.59	7.96	9.51	13.83	17.19	8.85	17.52	25.00	20.00	27.00
Chemicals	10.13	8.06	10.47	10.16	8.07	7.33	9.02	11.17	10.00	16.00	20.00	16.00
Insurance	4.50	2.16	3.01	3.23	6.94	3.02	1.85	5.82	3.20	5.70	8.50	5.70
Fuel	4.63	3.98	3.73	5.99	4.02	4.22	6.26	4.33	5.04	7.00	6.00	7.00
Labour	6.71	6.71	6.71	8.36	8.36	8.36	7.58	7.58	7.58	7.00	7.00	7.00
Land Repairs	4.54	4.29	3.89	6.42	5.48	5.31	7.93	6.54	5.88	7.00	7.00	7.00
Op. Interest	2.08	1.98	2.42	2.31	2.40	2.47	2.93	2.62	3.00	6.00	6.00	6.00
Miscellaneous	9.34	9.50	10.91	9.89	8.18	8.86	9.75	12.62	10.40	10.00	10.00	10.00
Other												
Total Variable	52.48	50.58	58.85	58.90	58.33	60.13	67.81	64.69	69.87	82.83	97.50	95.30
Total Fixed Expenses	16.73	16.31	15.68	21.49	18.30	16.01	18.99	15.55	17.84	30.00	30.00	30.00
Total	69.21	66.89	74.53	80.39	76.63	76.14	86.80	80.24	87.71	112.83	122.50	125.30
Cost/Bushel	1.38	1.67	3.39	1.66	2.84	2.82	1.64	2.86	2.92	1.74	4.38	3.13
Adj. Cost/Bushel*	1.97	2.39	4.84	2.34	4.00	3.97	2.05	3.58	3.65	1.74	4.38	3.13

*Converted to cost per cropped acre by the percent of land cropped.

Source: Saskatchewan Agriculture (Saskatchewan) and private sources (Manitoba).

MODMM-G (1987)

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R.M.A. Loyns
Neil Longmuir

Crop Wheat #1

Inputs	
PRICE (lb,bu,tonne)	
high	5.25
medium	4.75
low	3.75
budget	4.10
YIELD (acre,hectare)	
high	50
medium	45
low	30
budget	40
EXPENSES $/ac. or ha.	
Seed	10.00
Fertilizer	28.00
Insurance	5.25
Chemicals	19.00
Fuel	8.00
Labour	8.00
Land Costs	0.00
Repairs	7.00
Miscellaneous	5.00
Interest	5.00
Total Variable Operating Exp.	$95.25
Depreciation	25.00
Other fixed costs	5.00
TOTAL COSTS	$125.25

Outputs (NET RETURNS)

Price/Yield	high	med.	low	budget
high	137.25	111.00	32.25	84.75
med.	112.25	88.50	17.25	64.75
low	62.25	43.50	-12.75	24.75
budget	79.75	59.25	-2.25	38.75

The formulae for calculating NET RETURNS are as follows:

price per bushel (high price)..	5.25
times the bu/acre (high yield).	50
is equal to gross return.....	$262.50
minus the total cost.....	125.25
is equal to net return.....	$137.25

Breakeven Prices

Yield	High	Medium	Low	Budget
BE Price	1.91	2.12	3.18	2.38

Breakeven Yields

Price	High	Medium	Low	Budget
BE Yield	18.14	20.05	25.40	23.23

MODMM-G (1987)

Department of Agricultural Economics
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R.M.A. Loyns
Neil Longmuir

Crop Ordinary Wheat1&2

Inputs		Outputs (NET RETURNS)				
PRICE (lb,bu,tonne)		Price/Yield	high	med.	low	budget
high	4.75	high	112.25	88.50	17.25	64.75
medium	4.20	med.	84.75	63.75	0.75	42.75
low	3.50	low	49.75	32.25	-20.25	14.75
budget	3.85	budget	67.25	48.00	-9.75	28.75
YIELD (acre,hectare)						
high	50					
medium	45					
low	30					
budget	40					
EXPENSES $/ac. or ha.		The formulae for calculating NET RETURNS are as follows:				
Seed	10.00					
Fertilizer	28.00	price per bushel (high price)..				4.75
Insurance	5.25	times the bu/acre (high yield).				50
Chemicals	19.00	is equal to gross return.....				$237.50
Fuel	8.00	minus the total cost.....				125.25
Labour	8.00	is equal to net return.....				$112.25
Land Costs	0.00					
Repairs	7.00					
Miscellaneous	5.00					
Interest	5.00			Breakeven Prices		
Total Variable		Yield	High	Medium	Low	Budget
Operating Exp.	$95.25	BE Price	1.91	2.12	3.18	2.38
Depreciation	25.00					
Other fixed				Breakeven Yields		
costs	5.00	Price	High	Medium	Low	Budget
TOTAL COSTS	$125.25	BE Yield	20.05	22.68	27.21	24.74

MODMM-G (1987)

Department of Agricultural Economics
University of Manitoba

R.M.A. Loyns
Neil Longmuir

Crop WHEAT #3

Inputs		Outputs (NET RETURNS)				
PRICE (lb,bu,tonne)		Price/Yiel	eld high	med.	low	budget
high	4.00	high	58.75	42.75	-13.25	22.75
medium	3.50	med.	35.75	21.75	-27.25	4.25
low	3.00	low	12.75	0.75	-41.25	-14.25
budget	3.20	budget	21.95	9.15	-35.65	-6.85
YIELD (acre,hectare)						
high	46					
medium	42					
low	28					
budget	37					
EXPENSES $/ac. or ha.		The formulae for calculating NET RETURNS are as follows:				
Seed	10.00					
Fertilizer	28.00	price per bushel (high price)..				4.00
Insurance	5.25	times the bu/acre (high yield).				46
Chemicals	19.00	is equal to gross return.....				$184.00
Fuel	8.00	minus the total cost.....				125.25
Labour	8.00	is equal to net return.....				$58.75
Land Costs	0.00					
Repairs	7.00					
Miscellaneous	5.00					
Interest	5.00			Breakeven Prices		
Total Variable		Yield	High	Medium	Low	Budget
Operating Exp.	$95.25	BE Price	2.07	2.27	3.40	2.57
Depreciation	25.00					
Other fixed				Breakeven Yields		
costs	5.00	Price	High	Medium	Low	Budget
TOTAL COSTS	$125.25	BE Yield	23.81	27.21	31.75	29.77

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Crop CPS Wheat

Inputs		Outputs (NET RETURNS)				
PRICE (lb,bu,tonne)		Price/Yiel	eld high	med.	low	budget
high	4.00	high	147.75	67.75	27.75	87.75
medium	3.75	med.	130.25	55.25	17.75	74.00
low	3.00	low	77.75	17.75	-12.25	32.75
budget	3.25	budget	95.25	30.25	-2.25	46.50
YIELD (acre,hectare)						
high	70					
medium	50					
low	40					
budget	55					
EXPENSES $/ac. or ha.		The formulae for calculating NET RETURNS are as follows:				
Seed	12.00					
Fertilizer	32.00	price per bushel (high price)..				4.00
Insurance	5.25	times the bu/acre (high yield).				70
Chemicals	21.00	is equal to gross return.....				$280.00
Fuel	7.00	minus the total cost.....				132.25
Labour	8.00	is equal to net return				$147.75
Land Costs	0.00					
Repairs	7.00					
Miscellaneous	5.00					
Interest	5.00			Breakeven Prices		
Total Variable		Yield	High	Medium	Low	Budget
Operating Exp.	$102.25	BE Price	1.46	2.05	2.56	1.86
Depreciation	25.00					
Other fixed				Breakeven Yields		
costs	5.00	Price	High	Medium	Low	Budget
TOTAL COSTS	$132.25	BE Yield	25.56	27.27	34.08	31.46

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Crop Bly Feed

Inputs		Outputs (NET RETURNS)				
PRICE (lb,bu,tonne)		Price/Yield	eld high	med.	low	budget
high	2.75	high	146.75	119.25	36.75	105.50
medium	2.50	med.	121.75	96.75	21.75	84.25
low	1.80	low	51.75	33.75	-20.25	24.75
budget	2.20	budget	91.75	69.75	3.75	58.75
YIELD (acre,hectare)						
high	100					
medium	90					
low	60					
budget	85					
EXPENSES $/ac. or ha.						
Seed	9.00					
Fertilizer	32.00					
Insurance	5.25					
Chemicals	19.00					
Fuel	8.00					
Labour	8.00					
Land Costs	0.00					
Repairs	7.00					
Miscellaneous	5.00					
Interest	5.00					
Total Variable						
Operating Exp.	$98.25					
Depreciation	25.00					
Other fixed						
costs	5.00					
TOTAL COSTS	$128.25					

The formulae for calculating NET RETURNS are as follows:

price per bushel (high price)..	2.75
times the bu/acre (high yield).	100
is equal to gross return.....	$275.00
minus the total cost.....	128.25
is equal to net return	$146.75

Breakeven Prices

Yield	High	Medium	Low	Budget
BE Price	0.98	1.09	1.64	1.16

Breakeven Yields

Price	High	Medium	Low	Budget
BE Yield	35.73	39.30	54.58	44.66

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Crop: Malting Bly

Inputs		Outputs (NET RETURNS)				
PRICE (lb,bu,tonne)		Price/Yield	eld high	med.	low	budget
high	3.20	high	137.25	73.25	41.25	105.25
medium	2.80	med.	105.25	49.25	21.25	77.25
low	2.00	low	41.25	1.25	-18.75	21.25
budget	2.50	budget	81.25	31.25	6.25	56.25
YIELD (acre,hectare)						
high	80					
medium	60					
low	50					
budget	70					
EXPENSES $/ac. or ha.		The formulae for calculating NET RETURNS are as follows:				
Seed	8.50					
Fertilizer	26.00	price per bushel (high price)..				3.20
Insurance	5.25	times the bu/acre (high yield).				80
Chemicals	16.00	is equal to gross return.....				$256.00
Fuel	8.00	minus the total cost.....				118.75
Labour	8.00	is equal to net return				$137.25
Land Costs	0.00					
Repairs	7.00					
Miscellaneous	5.00					
Interest	5.00			Breakeven Prices		
Total Variable		Yield	High	Medium	Low	Budget
Operating Exp.	$88.75	BE Price	1.11	1.48	1.78	1.27
Depreciation	25.00					
Other fixed				Breakeven Yields		
costs	5.00	Price	High	Medium	Low	Budget
TOTAL COSTS	$118.75	BE Yield	27.73	31.70	44.38	35.50

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Crop Rapeseed No Treatment

Inputs		Outputs (NET RETURNS)				
PRICE (lb,bu,tonne)		Price/Yiel	eld high	med.	low	budget
high	7.50	high	181.00	106.00	31.00	83.50
medium	6.50	med.	141.00	76.00	11.00	56.50
low	5.50	low	101.00	46.00	-9.00	29.50
budget	6.00	budget	121.00	61.00	1.00	43.00
YIELD (acre,hectare)						
high	40					
medium	30					
low	20					
budget	27					
EXPENSES $/ac. or ha.		The formulae for calculating NET RETURNS are as follows:				
Seed	9.00					
Fertilizer	26.00	price per bushel (high price)..				7.50
Insurance	9.00	times the bu/acre (high yield).				40
Chemicals	14.00	is equal to gross return.....				$300.00
Fuel	8.00	minus the total cost.....				119.00
Labour	8.00	is equal to net return				$181.00
Land Costs	0.00					
Repairs	5.00					
Miscellaneous	5.00					
Interest	5.00			Breakeven Prices		
Total Variable		Yield	High	Medium	Low	Budget
Operating Exp.	$89.00	BE Price	2.23	2.97	4.45	3.30
Depreciation	25.00					
Other fixed				Breakeven Yields		
costs	5.00	Price	High	Medium	Low	Budget
TOTAL COSTS	$119.00	BE Yield	11.87	13.69	16.18	14.83

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Crop Rapeseed High Fertilizer

Inputs		Outputs (NET RETURNS)				
PRICE (lb,bu,tonne)		Price/Yiel	eld high	med.	low	budget
high	7.00	high	171.00	115.00	31.00	87.00
medium	6.00	med.	129.00	81.00	9.00	57.00
low	5.50	low	108.00	64.00	-2.00	42.00
budget	6.00	budget	129.00	81.00	9.00	57.00
YIELD (acre,hectare)						
high	42					
medium	34					
low	22					
budget	30					
EXPENSES $/ac. or ha.		The formulae for calculating NET RETURNS are as follows:				
Seed	9.00					
Fertilizer	28.00	price per bushel (high price)..				7.00
Insurance	9.00	times the bu/acre (high yield).				42
Chemicals	14.00	is equal to gross return.....				$294.00
Fuel	8.00	minus the total cost.....				123.00
Labour	8.00	is equal to net return				$171.00
Land Costs	0.00					
Repairs	7.00					
Miscellaneous	5.00					
Interest	5.00			Breakeven Prices		
Total Variable		Yield	High	Medium	Low	Budget
Operating Exp.	$93.00	BE Price	2.21	2.74	4.23	3.10
Depreciation	25.00					
Other fixed				Breakeven Yields		
costs	5.00	Price	High	Medium	Low	Budget
TOTAL COSTS	$123.00	BE Yield	13.29	15.50	16.91	15.50

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Crop Rapeseed Treated

Inputs		Outputs (NET RETURNS)				
PRICE (lb,bu,tonne)		Price/Yiel	eld high	med.	low	budget
high	7.00	high	171.00	115.00	10.00	94.00
medium	6.50	med.	148.50	96.50	-1.00	77.00
low	5.50	low	103.50	59.50	-23.00	43.00
budget	6.00	budget	126.00	78.00	-12.00	(60.00)
YIELD (acre,hectare)						
high	45					
medium	37					
low	22					
budget	34					
EXPENSES $/ac. or ha.		The formulae for calculating NET RETURNS are as follows:				
Seed	9.00					
Fertilizer	28.00	price per bushel (high price)..				7.00
Insurance	9.00	times the bu/acre (high yield).				45
Chemicals	35.00	is equal to gross return.....				$315.00
Fuel	8.00	minus the total cost.....				144.00
Labour	8.00	is equal to net return				$171.00
Land Costs	0.00					
Repairs	7.00					
Miscellaneous	5.00					
Interest	5.00			Breakeven Prices		
Total Variable		Yield	High	Medium	Low	Budget
Operating Exp.	$114.00	BE Price	2.53	3.08	5.18	3.35
Depreciation	25.00					
Other fixed				Breakeven Yields		
costs	5.00	Price	High	Medium	Low	Budget
TOTAL COSTS	$144.00	BE Yield	16.29	17.54	20.73	19.00

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Crop Rapeseed No Treatment Hedged

Inputs		Outputs (NET RETURNS)				
PRICE (lb,bu,tonne)		Price/Yiel	eld high	med.	low	budget
high	6.75	high	148.00	80.50	13.00	60.25
medium	6.40	med.	134.00	70.00	6.00	50.80
low	5.75	low	108.00	50.50	-7.00	33.25
budget	6.20	budget	126.00	64.00	2.00	45.40
YIELD (acre,hectare)						
high	40					
medium	30					
low	20					
budget	27					
EXPENSES $/ac. or ha.						
Seed	9.00					
Fertilizer	27.00					
Insurance	9.00					
Chemicals	14.00					
Fuel	8.00					
Labour	8.00					
Land Costs	0.00					
Repairs	7.00					
Miscellaneous	5.00					
Interest	5.00					
Total Variable Operating Exp.	$92.00					
Depreciation	25.00					
Other fixed costs	5.00					
TOTAL COSTS	$122.00					

The formulae for calculating NET RETURNS are as follows:

price per bushel (high price)..	6.75
times the bu/acre (high yield).	40
is equal to gross return.....	$270.00
minus the total cost.....	122.00
is equal to net return	$148.00

Breakeven Prices

Yield	High	Medium	Low	Budget
BE Price	2.30	3.07	4.60	3.41

Breakeven Yields

Price	High	Medium	Low	Budget
BE Yield	13.63	14.38	16.00	14.84

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Crop Flax

Inputs	
PRICE (lb,bu,tonne)	
high	8.50
medium	7.50
low	6.00
budget	7.00
YIELD (acre,hectare)	
high	30
medium	20
low	18
budget	25
EXPENSES $/ac. or ha.	
Seed	9.00
Fertilizer	22.00
Insurance	6.00
Chemicals	15.00
Fuel	7.00
Labour	8.00
Land Costs	0.00
Repairs	7.00
Miscellaneous	5.00
Interest	5.00
Total Variable Operating Exp.	$84.00
Depreciation	25.00
Other fixed costs	5.00
TOTAL COSTS	$114.00

Outputs (NET RETURNS)

Price/Yield	high	med.	low	budget
high	141.00	56.00	39.00	98.50
med.	111.00	36.00	21.00	73.50
low	66.00	6.00	-6.00	36.00
budget	96.00	26.00	12.00	61.00

The formulae for calculating NET RETURNS are as follows:

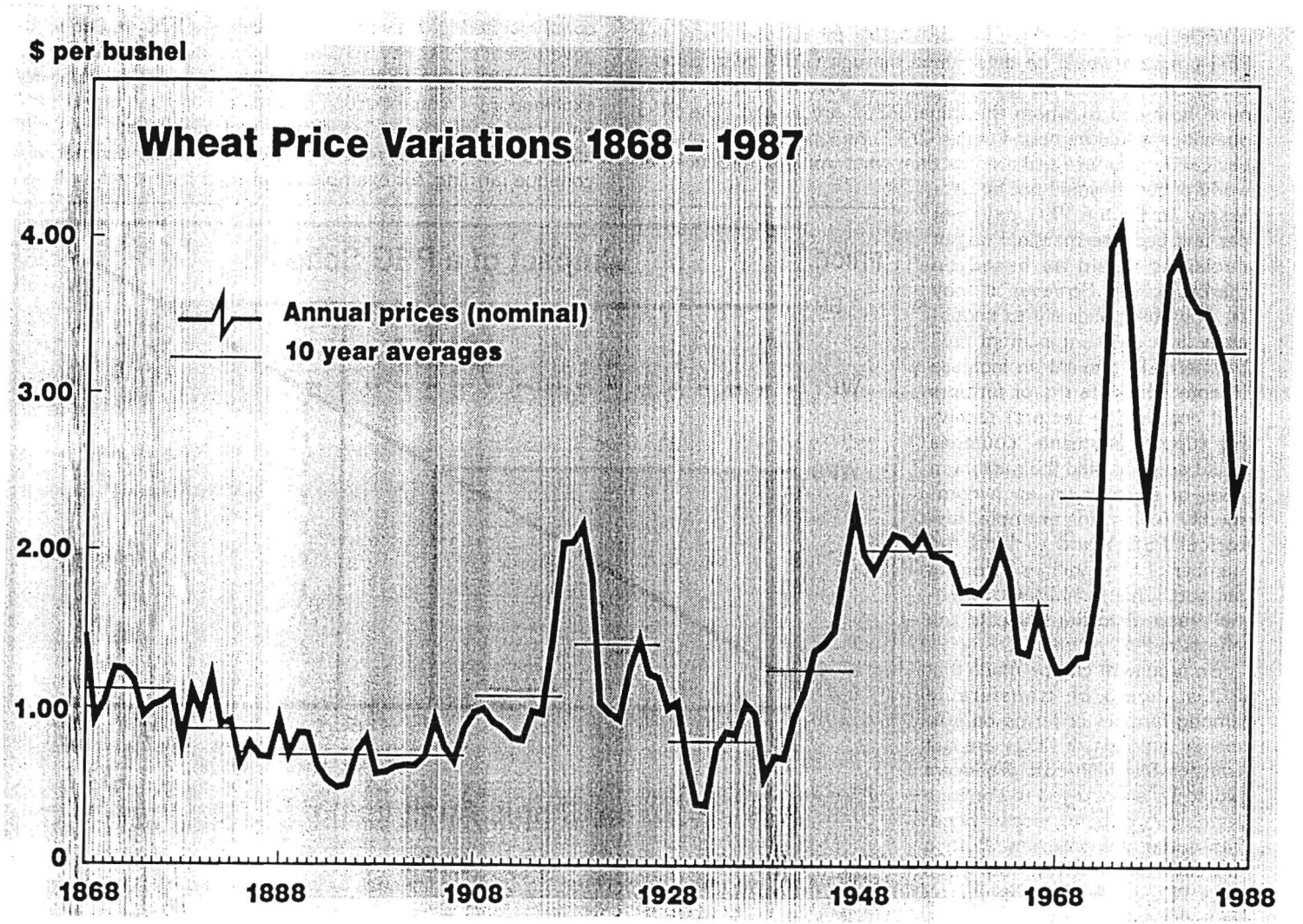
price per bushel (high price)..	8.50
times the bu/acre (high yield).	30
is equal to gross return.....	$255.00
minus the total cost.....	114.00
is equal to net return	$141.00

Breakeven Prices

Yield	High	Medium	Low	Budget
BE Price	2.80	4.20	4.67	3.36

Breakeven Yields

Price	High	Medium	Low	Budget
BE Yield	9.88	11.20	14.00	12.00


$ per bushel
Wheat Price Variations 1868 – 1987
4.00
3.00
2.00
1.00
0
Annual prices (nominal)
10 year averages
1868
1888
1908
1928
1948
1968
1988

Feeder Cattle: Break-even Analysis

Date Required: weight-in, weight-out, feed conversion rate, ration price, price (lb-in, price/lb out, rate of gain, variable, fixed, total production costs.

Range	Price in($/lb)	Price out($/lb)	Rates-of-gain(lb/head/day)
High	1.20	0.86	2.50
Medium	1.10	0.80	2.20
Low	0.98	0.74	1.80
Budget	1.05	0.77	2.00

Table 1.2: Net Returns with Four Levels of Purchasing Price

Price In (450 lbs)	Rate of Gain (lb/head/day)	Price Out			
		High	Medium	Low	Budget
		–$–	–$–	–$–	–$–
High (1.20)	High(2.50)	5.90	-63.10	-132.10	-97.60
	Medium(2.20)	-12.52	-81.52	-150.52	-116.02
	Low(1.80)	-46.64	-115.64	-184.64	-150.14
	Budget(2.00)	-27.88	-96.88	-165.88	-131.38
Medium (1.10)	High(2.50)	50.90	-18.10	-87.10	-52.60
	Medium(2.20)	32.48	-36.52	-105.52	-71.02
	Low(1.80)	-1.64	-70.64	-139.64	-105.14
	Budget(2.00)	17.12	-51.88	-120.88	-86.38
Low (0.98)	High(2.50)	104.90	35.90	-33.10	1.40
	Medium(2.20)	86.48	17.48	-51.52	-17.02
	Low(1.80)	52.36	-16.64	-85.64	-51.14
	Budget(2.00)	71.12	2.12	-66.88	-32.38
Budget (1.05)	High(2.50)	73.40	4.40	-64.60	-30.10
	Medium(2.20)	54.98	-14.02	-83.02	-48.52
	Low(1.80)	20.86	-48.14	-117.14	-82.64
	Budget(2.00)	39.62	-29.38	-98.38	-63.88

Source: MODMM. Calculated by Loyns and Kraut, December 1989.

APPENDIX II

Manitoba Agriculture: Farm Management Section, Cost of Production Estimates by Ralph Pieper with Parkland Market Estimates from L. McNichol, Winter 1990.

Total Break-even Prices

Operating Costs, $0.82/lb
Operating and Labour Costs, $0.97/lb
Operating Labour and Fixed Cost, $1.39/lb
Gross Revenue ($/cow) $513.19
Net Income ($/cow) $115.90

$$\text{Break-even Price} = \frac{\text{Cost}}{\text{\% Calf Crop/Calf Weight}}$$

Herd Profile

100 cows, 85% calf crop, calf weight 575 lb, cow mortality 1%, replacement rate: cows 15%, bulls 25%

Feed Cost: Barley $98/tonne
Bedding and Vet
Breeding Costs
Fuel, Oil, Repairs
Herd Replacement

Market Value per cow: $900 rep
600 cull

Fixed Costs
- barley and equipment $147,655

Pasture
- hectares/cow 2.6
  value/hectare 200

Feeder Cattle Cost of Production

Assumption
Conservation
- all feed purchased
- barley at new costs
- manure hauling contracted

	$/head
Total Operating Costs	$914.58
Total Fixed Costs	14.96
Total	$929.54
Labour	32.00
	$961.54
Gross Return	$864.00

Gross Return After Operating	- $50.58
Gross Return After Operating and Fixed	- $65.54
Gross Return After Total	- $97.54

Feeder Cattle Price, 105 $/cwt
Slaughter Cattle Finished Weight, 1,125 cwt
Feeder Purchased Weight, 550 cwt

Feed Costs

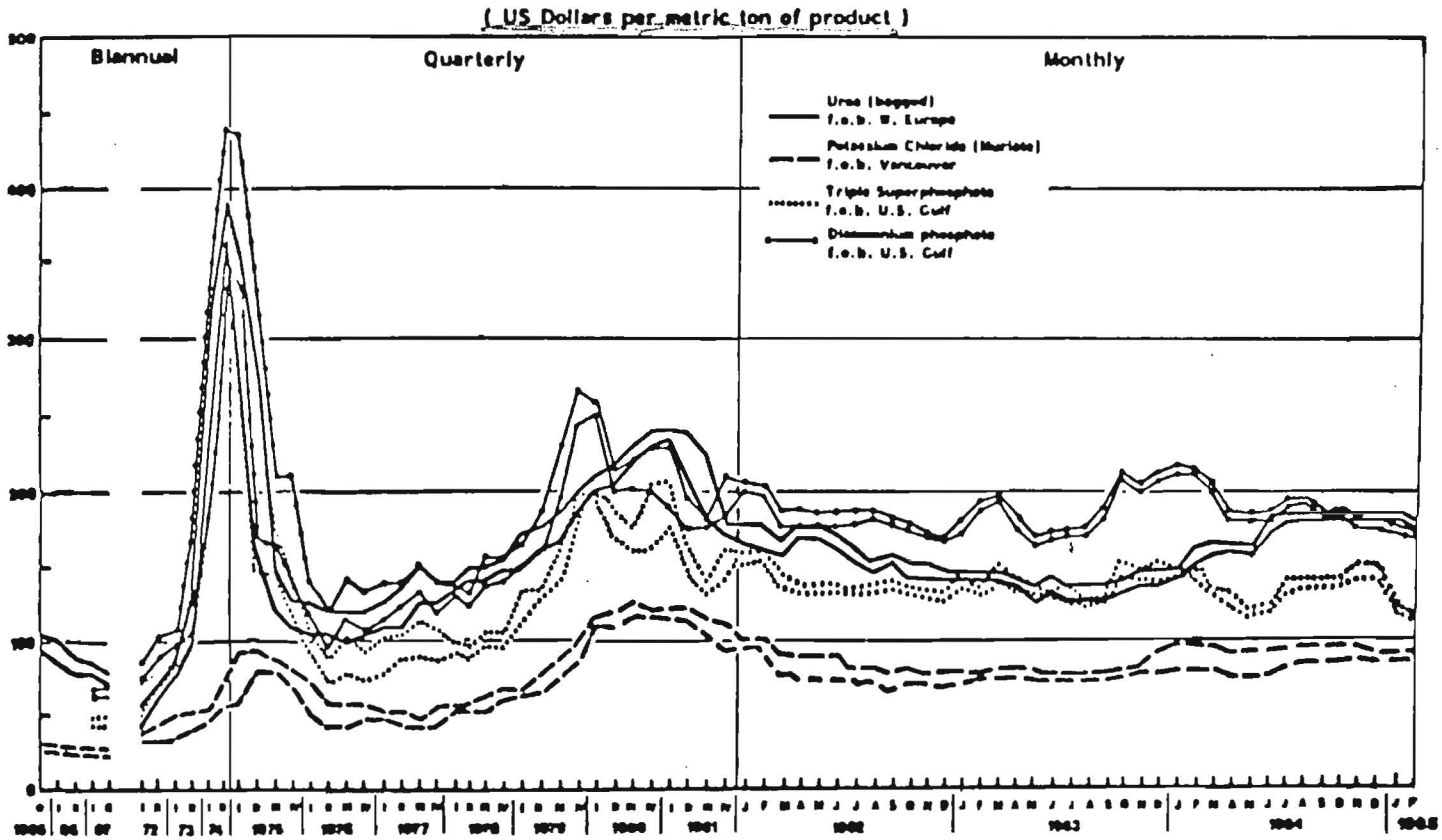
	$/tonne	
Ground Barley	110	7.7 kg/day
Hay	66	3.18 kg/day
Canola	180	.23
Salt	590	9.10 kg/year

Break-even Selling Price

Operating Cost	$0.85/lb (operating cost/weight after shrink)
Total Cost	$0.89/lb (total cost/weight after shrink)

ALBERTA AVERAGE FARM INPUT PRICES

FERTILIZER	FEB 8[illegible]	JAN 8[illegible]	FEB[illegible]
46-0-0, TONNE, BULK	$ 22.51	$ 241.97	$ 241.6
11-51-0, TONNE, BULK	$ 3[illegible].31	$ 2[illegible].79	$ 2[illegible].7
82-1-0, TONNE, BULK (APPLICATOR INCLUDED)	$ 3[illegible].[illegible]	$ 37[illegible].26	$ 37[illegible].6



The double lines indicate the price ranges for each product.

SOURCE: U.N. F.A.O. Commission on Fertilizers. Ninth Session, Current World Fertilizer Situation and Outlook (Rome, 1986) and F.A.O. Food Outlook, various issues.

FIGURE 3: EXPORT PRICES FOR SOME MAJOR FERTILIZER MATERIALS