

# Managing Price and Risk

## Case Study

The purpose of this exercise is to let you create your own marketing plan, examine crop insurance, execute contracts and futures/options hedges, and investigate the interaction of marketing and financial risk management strategies.

North Dakota version by George Flaskerud, NDSU Extension Crops Economist, based on case study by William I. Tierney, Jr., Extension Agricultural Economist, Kansas State University

## SITUATION

You and your spouse manage a crop farm with wheat, barley and sunflowers. Both of you are in your early 50s, and you operate the farm with your son, who is 22 years old, lives nearby, and is single but looking. He plans to operate the farm when you retire.

The farm has 1,600 crops acres. The acreage is split, 1000 of wheat, 300 of barley and 300 of sunflowers.

You have several bank notes outstanding for the land and farm machinery. Your debt/asset ratio is .40. You have budgeted out your operations and expect to have sufficient income to cover production expenses, bank payments and living expenses.

Your financial cushion, however, is sensitive to changes in yields and prices, so you are considering using multi-peril crop insurance and forward pricing strategies to manage your risk exposure. Insured yields are based on your 10-year average.

Your assignment is to manage production and marketing risk for the wheat crop. You will ignore the barley and sunflower crops.

You will have opportunities to sell your wheat crop on April 15, May 15, June 15, August 15 and November 15. You may:

- Make Cash Sales
- Cash Forward Contract
- Sell Futures or Fix Futures in a Contract
- Buy Puts
- Establish Synthetic Puts
- Use Fences

After the crop is sold, you may:

- Buy Futures
- Buy Call Options

You may not buy back futures hedges and you may not cancel elevator contracts unless it appears that you are unable to make delivery because of poor yields.

Commissions and interest total 2¢ per bushel.

You have enough storage with aeration on the farm for one crop. On-farm wheat storage costs include a one-time in/out charge of 10 cents per bushel plus 3 cents per bushel per month for interest and shrink.

Recent Minneapolis Wheat Futures prices are as follows:

May	344
July	351
September	358
December	367

## INSURANCE

### MPCI

APH = \_\_\_\_\_ Coverage @ \_\_\_\_% = \_\_\_\_\_ Bu/Ac

Price Guarantee = \$\_\_\_\_\_ Premium = \$\_\_\_\_\_ per Acre

### HAIL

No Deductible Premium = \$\_\_\_\_\_ per Acre

## COST-RETURN ESTIMATES FOR EXAMPLE FARM WHEAT ENTERPRISE

	CASH FLOW PER PLANTED ACRE
A-1. Crop and Hail Insurance Premium	\$ _____
A-2. Family Living and Hired Labor	\$ <u>20.00</u>
A-3. Other Direct Cash Costs	\$ <u>54.00</u>
A-4. Total Direct Cash Costs	\$ _____
B. Total Fixed Cash Costs	\$ <u>42.00</u>
C. Total Cash Costs per Acre	\$ _____
D. Yield Per Planted Acre Expected	_____
E. Expected Cash Price Per Bushel	\$ _____
F. Expected Market Income (D X E)	\$ _____
G. Government Payment	\$ <u>10.00</u>
H. Expected Returns (F + G)	\$ _____
I. Net Cash Flow (H - C)	\$ _____
J. Survival Breakeven Price (C-G)/D	\$ _____

## EXPECTATIONS

Local Harvest Cash Price	\$ _____
High Futures Price Mpl Sep	\$ _____
Seasonal High Month in Cash Market	Mth _____
Production	Bu _____
Harvest Basis, #1, 14% Protein	\$ <u>-0.30</u>

## MARKETING PLAN FOR WHEAT

Pct. of Crop	Time Deadline	MGE Futures Dec/Nearby Price Objective
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

## WHEAT MARKETING TRANSACTIONS

Keep Current

Complete for Date Initiated

<b>Transaction</b>	<u>4/15</u>	<u>5/15</u>	<u>6/15</u>	<u>8/15</u>	<u>11/15</u>	<u>Total</u>
<b>HTA/Futures Quantity</b>	_____	_____	_____	_____	XXX	_____
Futures Price	_____	_____	_____	_____	XXX	_____
Basis	_____	_____	_____	_____	XXX	_____
Cash Price	_____	_____	_____	_____	XXX	_____
Revenue	_____	_____	_____	_____	XXX	_____
<hr style="border-top: 1px dashed black;"/>						
<b>Put Strike Price</b>	_____	_____	_____	_____	XXX	_____
Quantity	_____	_____	_____	_____	XXX	_____
Premium Paid	_____	_____	_____	_____	XXX	_____
Premium Sold	_____	_____	_____	_____	XXX	_____
Gain (Loss)/Bu	_____	_____	_____	_____	XXX	_____
Gain (Loss) Total	_____	_____	_____	_____	XXX	_____
<hr style="border-top: 1px dashed black;"/>						
<b>Call Strike Price</b>	_____	_____	_____	_____	XXX	_____
Quantity	_____	_____	_____	_____	XXX	_____
Premium Paid	_____	_____	_____	_____	XXX	_____
Premium Sold	_____	_____	_____	_____	XXX	_____
Gain (Loss)/Bu	_____	_____	_____	_____	XXX	_____
Gain (Loss) Total	_____	_____	_____	_____	XXX	_____
<hr style="border-top: 1px dashed black;"/>						
<b>Fwd. Contract Quantity</b>	_____	_____	_____	_____	XXX	_____
Price	_____	_____	_____	_____	XXX	_____
Revenue	_____	_____	_____	_____	XXX	_____
<hr style="border-top: 1px dashed black;"/>						
<b>Cash Price</b>	XXX	XXX	XXX	_____	_____	_____
Quantity	XXX	XXX	XXX	_____	_____	_____
Revenue	XXX	XXX	XXX	_____	_____	_____
<hr style="border-top: 1px dashed black;"/>						
<b>TOTAL REVENUE</b>						_____
Bushels Produced						_____
<b>AVERAGE NET PRICE/BU</b>						_____

**Note: Storage costs and any LDP payment are included on the next page.**

**COMPLETE AFTER NOVEMBER 15:**

Calculate your return to marketing:

Average Net Price Received (p. 4) \$ \_\_\_\_\_  
 August 15 Cash Price \$ \_\_\_\_\_  
 Difference Per Bushel \$ \_\_\_\_\_

Calculate your total net cash flow for your wheat enterprise:

Total Production in Bushels \$ \_\_\_\_\_  
 Average Net Price Received \$ \_\_\_\_\_  
 Total Market Income \$ \_\_\_\_\_  
 Government Payment \$ \_\_\_\_\_  
 Indemnity Payments (If Any) \$ \_\_\_\_\_  
 Total Income \$ \_\_\_\_\_

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Storage Costs \$ \_\_\_\_\_  
 Other Cash Expenses (p. 2,c) \$ \_\_\_\_\_  
 Total Cash Expenses \$ \_\_\_\_\_

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Net Cash Flow (A) \$ \_\_\_\_\_  
 Net Cash Flow (B) if all Production  
 Was Priced © at Harvest -- \$\_\_\_\_\_/Bu. \$ \_\_\_\_\_

Group Analysis:

Yield	NCF(A)	NCF(B)	(A-B)	Pr ©	MPCI	Hail Ins	Mktg Tools Used

# CASE STUDY

APRIL 15

Situation:

Exports are expected to reach USDA's projections. Crop condition reports indicate that winter wheat yields could be below trend, especially since a hard freeze last week reached as far south as Kansas. The HRW yield could be less than 36 bushels per harvested acre. The planting intentions report indicated steady spring wheat acres although total U.S. wheat plantings were down 2 percent. World wheat production is expected to be down 3 percent from last year.

Examine Pricing Opportunities:

MGE Strike Price	+	Wheat Basis	-	Option Premium	=	Expected Net Price
-----(\$/Bu.)-----						
_____	+	_____	-	_____	=	_____

Should I sell Wheat Today? \_\_\_\_\_ (Yes/No)      What Quantity? \_\_\_\_\_

How? \_\_\_\_\_

Why? \_\_\_\_\_

Minneapolis Wheat Futures

	<u>Close</u>
May	353
July	358
September	362
December	367

Minneapolis Options

<u>Strike Price</u>	<u>Calls</u>	<u>Puts</u>
	<u>Sept</u>	<u>Sept</u>
340	33	11
350	27	15
360	22	20
370	18	26
380	14	32

Cash Forward Contract Price	\$3.12/Bu.
Average Harvest Basis	\$ -.30/Bu.
Loan Rate	\$2.58/Bu.

# CASE STUDY

MAY 15

Situation:

USDA's total use projections should be realized. Crop condition reports indicate that winter wheat yields may be similar to 1991 yields when the HRW yield was 25.4 bushels per planted acre. The pace of spring wheat plantings is about normal and moisture is adequate for uniform germination. Some analysts think HRS acres could be 2 million higher than intentions due to higher prices.

Examine Pricing Opportunities:

MGE Strike Price	+	Wheat Basis	-	Option Premium	=	Expected Net Price
-----(\$/Bu.)-----						

_____	+	_____	-	_____	=	_____
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Should I sell Wheat Today? \_\_\_\_\_ (Yes/No)                      What Quantity? \_\_\_\_\_

How? \_\_\_\_\_

Why? \_\_\_\_\_

Minneapolis Wheat Futures

	<u>Close</u>
May	368
July	373
September	377
December	382

Minneapolis Options

<u>Strike Price</u>	<u>Calls</u>	<u>Puts</u>
	<u>Sept</u>	<u>Sept</u>
360	28	12
370	23	16
380	18	21
390	14	27
400	10	33

Cash Forward Contract Price	\$3.37/Bu.
Average Harvest Basis	\$ -.30/Bu.
Loan Rate	\$2.58/Bu.

# CASE STUDY

JUNE 15

Situation:

A below average yielding winter wheat crop was produced, as in 1991. Spring Wheat plantings were generally completed by late May and in most areas the crop entered the growing season in good condition. HRS acres increased 1.0 million from a year ago. Total wheat acres are about unchanged from a year ago. The spring wheat crop is beginning to show drought stress. Only light, scattered showers are in the forecast. Your crops got planted on time and they look fair so far. USDA is projecting that exports for the marketing year will be about the same as for last year.

Examine Pricing Opportunities:

MGE Strike Price	+	Wheat Basis	-	Option Premium	=	Expected Net Price
-----(\$/Bu.)-----						
_____	+	_____	-	_____	=	_____

Should I sell Wheat Today ? \_\_\_\_\_ (Yes/No)      What Quantity? \_\_\_\_\_

How? \_\_\_\_\_

Why? \_\_\_\_\_

Should I buy a call option on some of the wheat I sold previously? \_\_\_\_\_ (YES/NO)

What Quantity? \_\_\_\_\_

Why? \_\_\_\_\_

Minneapolis Wheat Futures

	<u>Close</u>
July	361
September	365
December	371

Minneapolis Options

<u>Strike Price</u>	<u>Calls</u>	<u>Puts</u>
	<u>Sept</u>	<u>Sept</u>
340	30	6
350	24	9
360	18	13
370	13	18
380	9	24
390	6	31
400	4	39

Cash Forward Contract Price	\$3.25/Bu.
Average Harvest Basis	\$-.30/Bu.



# CASE STUDY

AUGUST 15

Situation:

Fairly good rains fell in the spring wheat area during late June. Growing conditions were generally favorable during July in both the spring wheat area and the corn belt. Above average spring wheat yields are expected, about 36 bushels per harvested acre, and the HRS crop appears to be of good quality. Some analysts feel yields are overestimated. Minneapolis futures have dropped to a 25 cent premium over Chicago. Exports are slow. Ending stocks of wheat are expected to decrease. A 20 cent LDP is available.

Examine Pricing Opportunities:

MGE Strike Price	+	Wheat Basis	-	Option Premium	=	Expected Net Price
-----(\$/Bu.)-----						
_____	+	_____	-	_____	=	_____

Should I sell Wheat Today ? \_\_\_\_\_ (Yes/No)      What Quantity? \_\_\_\_\_

How? \_\_\_\_\_

Why? \_\_\_\_\_

Should I buy futures or call options on some of the wheat sold in the cash market? \_\_\_\_\_

(YES/NO) What Quantity? \_\_\_\_\_

How? \_\_\_\_\_

Why? \_\_\_\_\_

Storage costs until November 15? \_\_\_\_\_

Minneapolis Wheat Futures

	<u>Close</u>
September	330
December	335
March	347
May	350

Strike  
Price

330  
340  
350  
360  
370

Minneapolis Options

Calls

Dec  
16  
11  
7  
5  
3

Puts

Dec  
11  
16  
22  
29  
37

Local Cash Price (Immediate Delivery)      \$3.00/Bu.

# CASE STUDY

NOVEMBER 15

Situation:

The September stocks report indicated that the HRW and HRS crops were overstated. Conversely, exports are exceeding expectations. It appears that the S/U ratio will further decrease in the December USDA report. The LDP is now zero.

Sell your remaining wheat based on today's local cash price. Offset any futures or options positions. Calculate futures/options gains or losses and storage costs.

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Minneapolis Wheat Futures

	<u>Close</u>
December	362
March	374
May	377
July	387

Local Cash Price (Immediate Delivery) \$3.42/Bu.