

Comparing Returns for Grain Corn Production under Various Marketing Strategies



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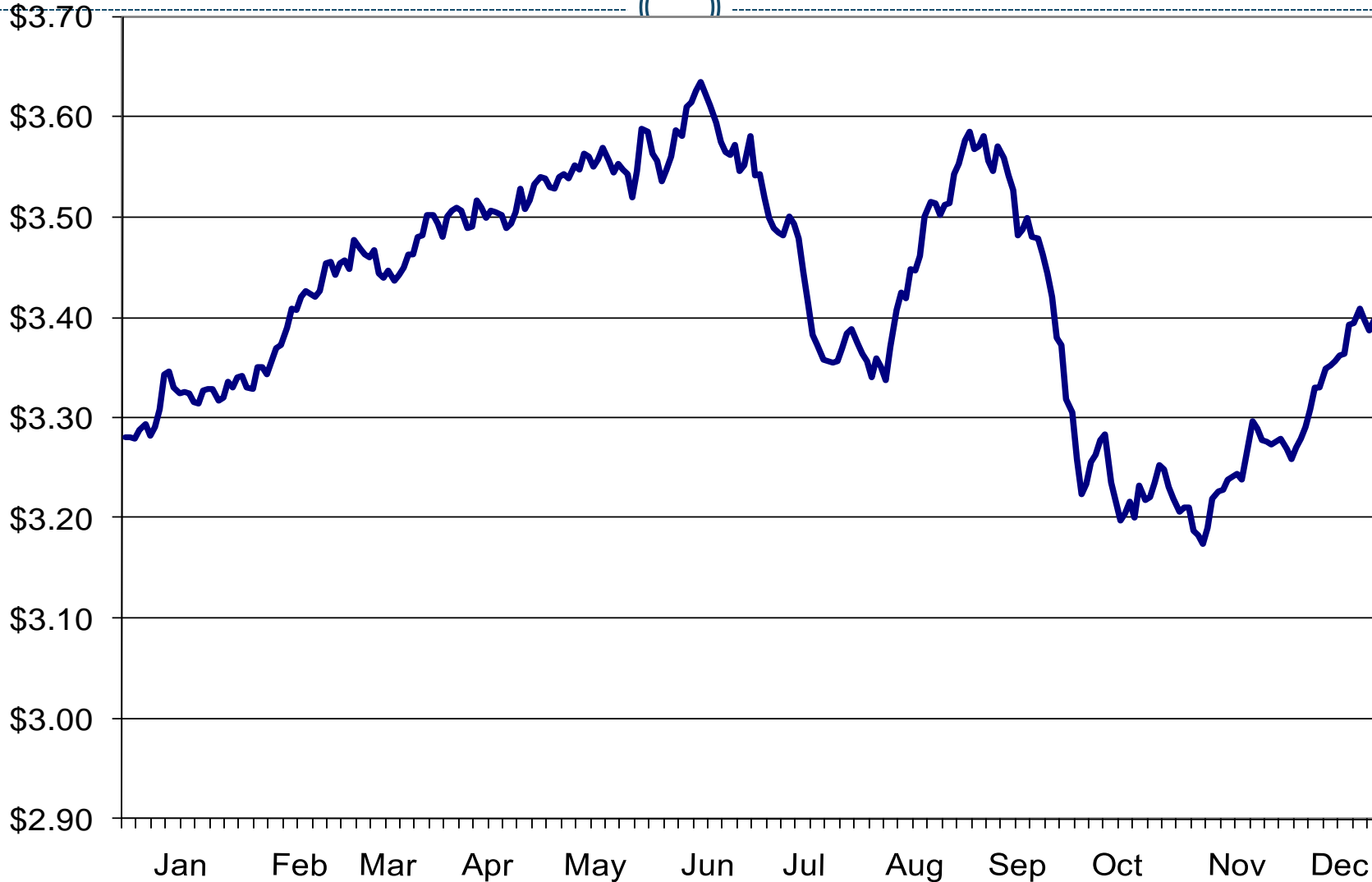
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Marketing Questions



- When to sell?
- What tools to use?
- Use a consistent strategy from year to year?

Average Corn Prices in Southwestern Ontario: 1992-2008



Previous Studies on Marketing Strategies



- **Wisner, Blue, & Baldwin (1998)**
 - Use of futures and options increased returns relative to cash sales at harvest for corn and soybeans
- **Curtis, Pfeiffer, Lutgen, & Frank (1987)**
 - Use of hedges increased returns for soybean producers
- **Frank, Irwin, Pfeiffer, & Curtis (1989)**
 - Use of options increased returns and reduced variance of returns

Previous Studies on Marketing Strategies



- Other studies did not find differences in returns among different strategies
 - Zulauf & Irwin (1998)
 - Peterson & Tomek (2005)
 - Martin & Hope (1984)

Methods



Simulation Model



- Data
 - Historical daily Ontario Commodity Reports
 - ✦ Cash and futures prices
 - Chicago Board of Trade
 - ✦ Options premiums
 - Time period: 1992-2008
- Strategies – developed with input from marketing specialists and producers

Strategies



- Prices are randomly selected from a range of dates
- Sales or contracts for each strategy are made over the same range of dates in every year
- 5 time periods during which sales or contracts are made
 - Harvest (October 21 – November 10)
 - Early in the new year (January 5 – 25)
 - Spring (April 10 – 30)
 - Early summer (June 20 – July 10)
 - Late summer (August 10 – 30)

Strategies



- Share of crop sold for selected time periods is selected from specified ranges
 - Based in part on price relative to COP
- The share of the crop sold through forward contracts and futures contracts is based on expected production

Strategies: Cash Sales



Strategy	Tool	Time Period	Share of Crop
1	Cash sale	Harvest	100%
2	Cash sale	Early new year	100%
3	Cash sale	Harvest	20-30%
	Cash sale	Early new year	40-60%
	Cash sale	Early summer	10-40%
4	Cash sale	Harvest	10-20%
	Cash sale	Early new year	10-20%
	Cash sale	Spring	20-30%
	Cash sale	Early summer	20-30%
	Cash sale	Late summer	10-40%

Strategies: Forward Contracts



Strategy	Tool	Time Period	Share of Crop
5	Forward contract	Spring	40-60%
	Cash sale	Harvest	40-60%
6	Forward contract	Early summer	40-60%
	Cash sale	Early new year	40-60%
7	Forward contract	Spring	25-35%
	Forward contract	Early summer	25-35%
	Cash sale	Early new year	15-25%
	Cash sale	Spring	5-35%

Strategies: Futures Contracts



Strategy	Tool	Time Period	Share of Crop
8	Futures contract - short	Spring	75-100%
	Futures contract - long	Harvest	75-100%
	Cash sale	Harvest	100%
9	Futures contract - short	Early summer	75-100%
	Futures contract - long	Harvest	75-100%
	Cash sale	Harvest	100%
10	Futures contract - short	Spring	40-60%
	Futures contract - short	Early summer	40-60%
	Futures contract - long	Harvest	80-100%
	Cash sale	Harvest	100%

Strategies: Options



Strategy	Tool	Time Period	Share of Crop
11	Put option	Spring	75-100%
	Offset option (if profitable)	Harvest	75-100%
	Cash sale	Harvest	100%
12	Put option	Early summer	75-100%
	Offset option (if profitable)	Harvest	75-100%
	Cash sale	Harvest	100%
13	Put option	Spring	40-60%
	Put option	Early summer	40-60%
	Offset option (if profitable)	Harvest	80-100%
	Cash sale	Harvest	100%
14	Cash sale	Harvest	100%
	Call option	Harvest	50-75%
	Offset option (if profitable)	Spring	50-75%

Strategies: Other



Strategy	Tool	Time Period	Share of Crop
15	Cash sale	Harvest	25-50%
	Basis contract	Early new year	50-75%
	Price out basis contract	Spring	50-75%
16	Forward contract	Spring	40-60%
	Futures contract - short	Early summer	40-60%
	Futures contract - long	Harvest	40-60%
	Cash sale	Harvest	100%
17	Forward contract	Spring	40-60%
	Put option	Early summer	40-60%
	Offset option (if profitable)	Harvest	40-60%
	Cash sale	Harvest	100%
18	Depends on market conditions		

Other Model Considerations



- Storage costs
- Interest on inventory
- Interest costs on funds required for trading accounts
- Commission fees
- Converting to Canadian currency
- Options: strike prices close to current futures prices are selected
- Options are offset at harvest if any value remains
- Returns for each strategy are on a per-bushel basis

Methods of Analysis



- Simulation model is run 1,000 times for each strategy
 - Accounts for semi-random selection of date and percentage of crop sold
- Average prices generated by the model for each strategy are compared
 - t-tests are used to test for statistically significant differences

Methods of Analysis



- Results analyzed across entire time period (1992-2008)
- Results broken down into two groups
 - Years in which pre-harvest prices are higher than COP
 - ✦ 1994-1998, 2000, 2004, 2007, 2008
 - Years in which pre-harvest prices are lower than COP
 - Relative effectiveness of strategies are compared across both groups

Results of the Simulation Model



Results: All Years



- Average price for the baseline strategy: \$3.21/bu
- Strategies with highest average prices:
 - Futures contracts (spring & early summer) +32.8*
 - Futures contract (spring) +31.8*
 - Futures contract (early summer) +31.1
 - Forward contract (spring) & futures (early summer) +29.8*

**,* - significant at 5% and 10%, respectively

Results: All Years



- Other strategies that performed well:
 - Put option (early summer) +27.5
 - Forward contract (spring) & put option (early summer) +27.3*
 - Variable (depends on market conditions) +27.2**
 - Put options (spring & early summer) +23.5*
 - Put option (spring) +17.9*
- Prices for forward contract strategies were 11.2 to 17.5 cents/bu higher than the baseline
- Price for the basis contract strategy was 16.4 cents/bu higher

**,* - significant at 5% and 10%, respectively

Results: All Years



- Other results:
 - Prices for other cash sale strategies were only 7.8 to 10.4 cents/bu higher than the baseline
 - Average price for the call option strategy was only 5.1 cents/bu higher

Results: Higher-Price Years



- Results are similar to those across all years but with greater differences from the baseline
- Average price for the baseline strategy: \$3.35/bu
- Strategies with highest average prices:
 - Futures contracts (spring & early summer) +60.6*
 - Futures contract (early summer) +59.4
 - Forward contract (spring) & futures (early summer) +58.6*
 - Futures contract (spring) +57.5*

**,* - significant at 5% and 10%, respectively

Results: Higher-Price Years



- Other strategies that performed well:
 - Forward contract (spring) & put option (summer) +50.9*
 - Put option (early summer) +46.6
 - Variable (depends on market conditions) +41.1*
 - Put options (spring & early summer) +41.0*
 - Forward contracts (spring & early summer) +34.2**
 - Put option (spring) +34.0*
 - Forward contract (early summer) +26.7**
 - Forward contract (spring) +23.1*

**,* - significant at 5% and 10%, respectively

Results: Higher-Price Years



- Other results:
 - Prices for other cash sale strategies were only 6.7 to 23.0 cents/bu higher than the baseline
 - Average price for the call option strategy was only 10.7 cents/bu higher

Results: Lower-Price Years



- Results are much different than for higher-price years
- Average price for the baseline strategy: \$3.05/bu
- Strategies with highest average prices:
 - Cash sale (new year) +14.5
 - Basis contract +12.9*
 - Variable +11.4
- Average prices for some strategies were less than the baseline (e.g., forward contract strategies)

Factors Impacting the Results



- Results affected by 1996 and 2008
 - Without these years many of the differences from the baseline would not have been statistically significant
- Use of elevator storage rates
 - May affect average prices for strategies that use multiple cash sales throughout the year

Limitations



- Model does not account for production risk or yield fluctuations
- Assumptions had to be made in the specification of marketing strategies, such as the timing and amounts of sales
- Strategies with futures and options did not hedge the Canadian dollar
- Results for strategies with options may be sensitive to the selection of strike prices

Conclusions



- When pre-harvest strategies do well, they do very well
- Strategies that used futures or options tended to do better than those with forward contracts since the price for the entire expected production was hedged
- In years where the market prices are relatively low there is no clear answer as to the strategy that tends to be most effective
- Variable strategy did relatively well across both higher-price years and lower-price years