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Marketing Strategies for Idaho Wheat Producers: Identifying Top Performers

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Introduction

The rapid flow of information and the increasingly complex interaction between supply and demand factors in the past thirty years have significantly changed grain markets. Regardless, many growers still rely solely on the elevator quote at harvest time. For long-term sustainability, it is crucial for producers to develop a well-defined plan for managing price risks. While the benefits of hedging are well documented in the existing literature, our understanding of the effectiveness of commonly employed marketing strategies remains limited, largely due to regional differences that make it difficult to make any broad generalizations about hedging practices among producers.

In this publication, we explore the potential outcomes winter wheat producers in Idaho might have experienced after adopting six marketing strategies for the 2000–22 crop years. These strategies were chosen based on studies examining marketing outcomes in other regions (Hart 2022) as well as discussions with producers and merchandisers. It is important to note that different strategies are applicable depending on a specific situation and that we only discuss a subset of strategies that producers may employ.

Marketing Strategies Analyzed

The six strategies we considered are as follows:

1) **Taking harvest bids:** A producer sells their entire crop at the cash prices offered at harvest (August) without employing any form of price risk management. This strategy serves as the standard for subsequent comparisons.

2) **Average pricing:** A producer sells 10% of the expected output each month between January and July before harvest using hedging on futures or hedge-to-arrive (HTA) contracts and sells the remaining 30% at prevailing harvest prices. The basis is set at harvest for preharvest sales.

3) **Time and price:** A producer sells 25% each month between March and May before harvest if prices are greater than production costs, plus a 70% profit margin above operating cost. The remaining 25% is sold in August at harvest prices. If the price objective is not reached, the producer will default to harvest sales. The basis is set at harvest for preharvest sales. March–May are chosen since cash prices tend to be the highest in these months.

4) **Basis speculation:** A producer speculates on an unusually high basis to attain a more favorable selling price before the harvest. When the basis exceeds the threshold, the producer would initiate a fixed basis contract on 15% of their crop each month until harvest or until 60% is sold. The price of the fixed basis contract is set at harvest, as well as the price of the remaining unhedged crop. An unusually high basis is defined as when the basis is above the mean value plus one standard deviation over the study period.

5) **Stepped price target:** From February to July, prior to harvest, a producer initiates sales of 25% of the anticipated crop at each of the following steps: price plus a margin of 80%, 90%, and 100% above production cost. The maximum hedge is 75% of the expected crop. If some targets are not met, all remaining bushels are sold at harvest prices. Basis is set at harvest for those preharvest sales.

6) **Delayed pricing:** Instead of preharvest or harvest sales, a producer uses delayed pricing contracts to sell their crops three months after harvest (November), thereby incurring storage costs. November is chosen since the cash price after harvest (but before the next calendar year) tends to reach the highest around that time. Producers will be paying for storage at commercial facilities.[1]

[1]For producers with on-farm storage facilities, they can store the harvested crop on the farm. In such cases, there will be no storage fees. However, there may be quality reductions with storage.

Related Concepts

basis. The difference between cash and futures prices for a given location at a given time.

hedging. A strategy that aims at limiting price risks by using futures contracts or other commodity derivatives to lock in a price before the actual sales. The final net price received by the producer through hedging is equal to the price when they initiated the hedge plus the basis when unwinding the hedge. For hedged commodities, producers are essentially exchanging basis risk for price risk.

Data and Seasonality in Prices

We consider the monthly average cash price received by Idaho producers for winter wheat as reported by the United States Department of Agriculture National Agricultural Statistics Service (USDA NASS).[2] For futures prices, we rely on the September soft red winter wheat futures contracts traded on the Chicago Board of Trade. The September contract is selected since most of the winter wheat in Idaho is harvested in mid-to-late summer.[3] We use the Chicago wheat futures contract since most of the wheat produced in Idaho is soft white wheat. The basis is computed by subtracting the futures price from the cash price.

The seasonal index in Figure 1 depicts the average cash price by month as a percentage of the marketing year average. Prices exhibit an upward trend during the first half of the year leading up to harvest. Consequently, locking in prices before harvest may allow producers to capitalize on the higher price levels that prevail in the preharvest season, provided that there are no significant adverse fluctuations in basis. Additionally, prices on average tend to rise after harvest. This pattern suggests a potential benefit for producers in delaying sales until after the harvest, rather than selling immediately at harvest time.

The time and price and stepped price target strategies aim to lock in some profit margins before harvest. To obtain the operating cost data, we rely on the University of Idaho's cost of production from the 2019 enterprise budget and the USDA cost of production estimate for wheat. Using 2019 as a base, we extrapolate the cost using the year-over-year increases/decreases in the USDA cost of production annual estimates. See the appendix for a detailed discussion of the cost data.

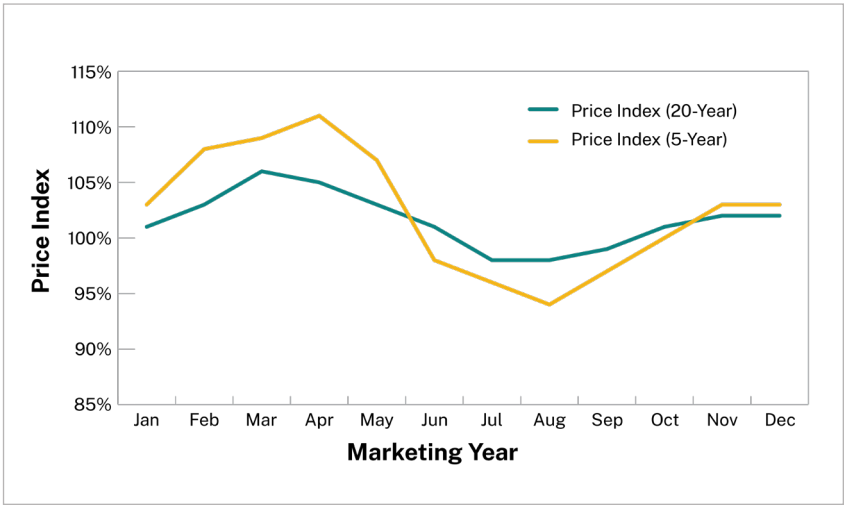

Figure 1. Winter wheat seasonal cash price index in Idaho for data ending in the 2022/23 marketing year.

Marketing Outcomes under Different Marketing Strategies

Based on the data discussed earlier, we compute the net price received under each of the six strategies. Except for taking harvest bids and delayed pricing strategies, the other four all involve selling crops before the harvest. Table 1 provides the price received over the years, price variability (measured by standard deviation), the percentage of years in which a higher price is realized, and the percentage of years in which a higher or same price is realized.

Column (1) in Table 1 shows the final price received when no risk management is employed. The highest price was achieved in the crop year 2022 ($7.78/bushel), followed by 2012 ($7.58/bushel) and 2008 ($7.41/bushel). As can be seen, all other five strategies resulted in a higher average price compared to the base strategy. Among these, the stepped price target and delayed pricing strategies stood out as the most successful, yielding an average price of $5.07/bushel and $5.13/bushel, respectively. When considering years where the price received was the same as or higher than the base strategy, all strategies were able to accomplish this for the majority of years.

[2]USDA NASS reports monthly winter wheat prices in Idaho. Although some weekly prices are available for selected locations in Idaho through the Idaho Barley Commission, there are many missing observations. We opt to use the USDA data for consistency.
[3]We also considered December futures contract. Results are qualitatively similar to those using September futures contract. For a robustness check, we alternatively used the hard red winter (HRW) wheat futures contract traded on the Kansas City Board of Trade, with similar results. These results are available in the appendix.

Table 1. Comparison of marketing outcomes for Idaho winter wheat producers (Chicago soft white wheat September futures contract), in $/bushel, 2000–22.

Crop Year	(1) Taking Harvest Bids	(2) Average Pricing	(3) Time and Price	(4) Basis Speculation	(5) Stepped Price Target	(6) Delayed Pricing
2000	2.19	2.47	2.19	2.19	2.19	2.33
2001	2.94	3.07	2.94	2.94	2.94	3.15
2002	3.54	3.18	3.07	3.58	3.40	3.93
2003	3.25	2.92	3.25	3.90	3.15	3.17
2004	3.55	4.04	4.20	3.55	4.20	3.39
2005	3.08	3.18	3.23	3.08	3.08	2.96
2006	3.42	3.46	3.42	3.42	3.42	4.16
2007	5.27	4.10	3.79	5.27	3.77	6.61
2008	7.41	7.98	8.25	7.90	8.71	6.79
2009	4.81	5.50	5.53	4.94	5.24	4.29
2010	4.79	3.63	3.43	4.79	4.40	5.64
2011	6.74	7.40	7.59	6.74	7.82	6.50
2012	7.58	6.33	5.96	7.58	6.04	8.22
2013	6.87	7.43	7.42	6.94	7.53	6.91
2014	6.25	6.86	7.37	6.22	7.15	5.96
2015	5.69	5.89	5.78	5.73	5.82	5.11
2016	4.07	4.56	4.07	4.07	4.07	3.78
2017	4.11	4.40	4.11	4.11	4.11	4.26
2018	4.98	4.75	4.98	4.98	4.98	5.09
2019	4.95	5.11	4.94	5.08	4.95	4.97
2020	4.70	4.85	4.70	4.70	4.70	5.00
2021	5.84	5.38	5.63	5.84	5.84	7.51
2022	7.78	8.96	10.04	7.78	9.17	8.42
Average Price	4.95	5.02	5.04	5.01	5.07	5.13
Standard Deviation	1.57	1.75	1.95	1.59	1.88	1.69
Minimum Price	2.19	2.47	2.19	2.19	2.19	2.33
Maximum Price	7.78	8.96	10.04	7.90	9.17	8.42
% Price > Strategy 1		70%	39%	30%	35%	61%
% Price ≥ Strategy 1		70%	74%	96%	78%	61%

Notes: *Price represents the final net price received per bushel for winter wheat producers in Idaho. We assume a storage cost of $0.025/month in computing the final price received under the delayed pricing strategy. Shaded cells represent years when the respective strategy yields higher net prices than the base strategy of taking harvest bids. Cash prices were sourced from USDA NASS (2023) and wheat futures prices were sourced from the Chicago Board of Trade via the Bloomberg Terminal.*

It is worth noting that the high success ratio of the basis speculation strategy (same or better than cash price) is primarily due to the significant number of years where no fixed basis contract was initiated. When fixed-basis contracts were employed, however, the strategy proved successful where the producer was able to obtain a higher price compared to the base strategy in most of the cases. This highlights the potential for incorporating basis speculation into risk management plans to generate additional farm revenue.

Also of note is the average pricing strategy in column (2). The final price received under this strategy was greater than the cash price in sixteen of the twenty-three years (70% of the time). In particular, average pricing allowed the producer to achieve higher prices in eight of the last ten years. Meanwhile, the step price target and time and price strategies performed rather similarly, in terms of both average prices received, standard deviation, and percentage of success rate.

Although the delayed pricing strategy resulted in the highest average price over the study period, its success is mainly due to the high prices received in the 2007, 2012, and 2021 crop years. In 2007, global wheat prices increased dramatically because of high energy prices, rising global demand, and low inventories. The high global wheat prices in 2012 and 2021 were primarily driven by the high global use relative to production. Winter wheat cash prices in Idaho increased by almost 60%, 30%, and 40% between January and December in these two years, respectively. Excluding these three years, the delayed pricing strategy resulted in a substantially lower average price ($4.79/bushel) than preharvest marketing strategies (around $5/bushel except for basis speculation), but still higher than selling at harvest ($4.76/bushel).

Further Discussion on Marketing Outcomes

The performance of the strategies discussed varies from year to year. Generally, selling either before harvest or several months afterward tends to be advantageous when prices follow the seasonal pattern described in Figure 1. This is true for certain years examined in this study. For instance, during the 2017–19 crop years, winter wheat cash prices were relatively stable, ranging from $3.85 to $5.25/bushel. The stability was primarily due to relatively high ending stocks-to-use ratios, as shown in Figure 2. In all these years, a noticeable price dip around the harvest period occurred, followed by an increase, thereby supporting the effectiveness of both preharvest selling and delayed pricing strategies.

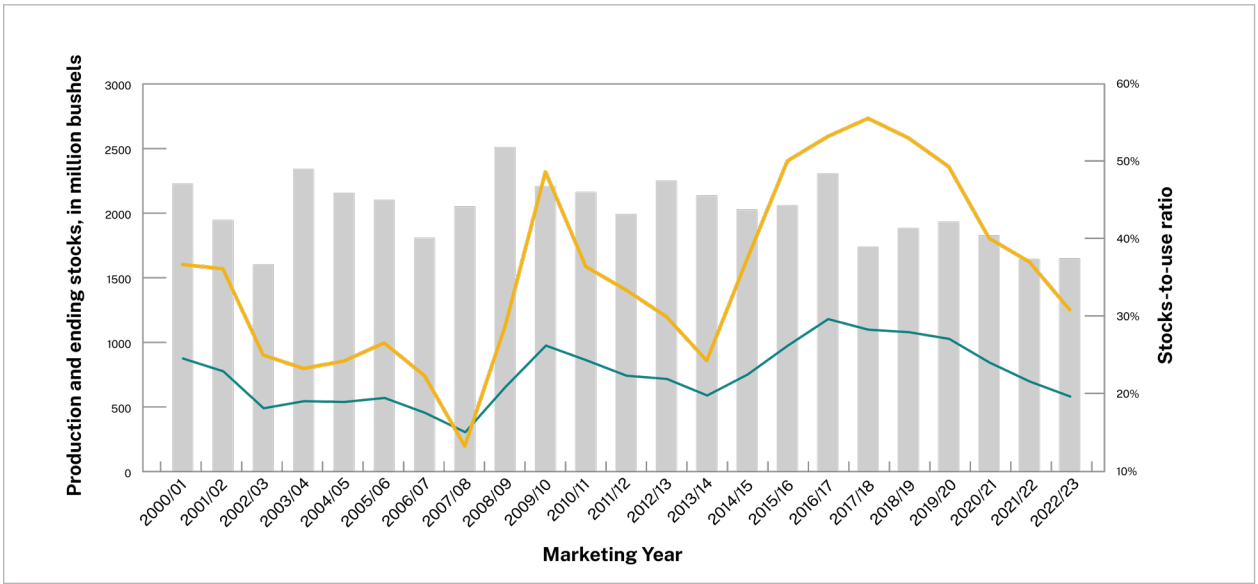

Figure 2. US wheat production, ending stocks, and stocks-to-use ratio, 2000/01–2022/23 marketing years.[4]

[4]Marketing year refers to the twelve months after crop harvest. For wheat, this refers to June–May of the following year. Therefore, 2022/23 refers to crops harvested in 2022 or the 2022 crop year.

A similar pattern emerged in the 2020 crop year. Despite the turmoil induced by COVID-19 disruptions in the global food supply chain, wheat prices exhibited a seasonal trend akin to those presented in Figure 1. This consistency underscores the potential reliability of preharvest and delayed pricing strategies, particularly when market conditions reflect traditional seasonal fluctuations.

Regarding the specific type of preharvest marketing strategies, average pricing, time and price, and stepped price target strategies all involve short hedging either using futures or HTA contracts. These strategies perform best when the basis is expected to strengthen while the price is unlikely to rise during the crop year. Preharvest sales using fixed basis contracts are best used when the basis is already strong and/or is expected to weaken, while prices are expected to improve. Producers who want to secure a profit margin may wish to consider the stepped price or time and price strategies. Meanwhile, the average pricing strategy allows producers to spread out the pricing risk while taking advantage of seasonal price patterns.

When Preharvest Hedging Tends to Underperform

Selling before harvest can lead to less favorable returns in situations of a tight supply. For example, the severe drought in 2012 significantly impacted the US wheat crop, causing yields to plummet. Prices surged following the May USDA Crop Progress report, which indicated a substantial decline in winter wheat crops rated as being in good or excellent condition due to the drought. The elevated prices persisted into the following crop year. As a result, those who opted to sell at harvest or adopted a delayed pricing approach secured higher prices compared to those who sold preharvest. Notably, the delayed pricing strategy yielded $8.22/bushel, over $2/bushel more than the time and price and stepped price target strategies.

A similar scenario occurred in the 2021 crop year when a significant drought hit the northwestern US plains, drastically reducing the region's wheat yield. The drought led to the lowest total US wheat production in nearly twenty years. Meanwhile, wheat demand surged amid concerns that key exporting countries might restrict exports due to food security issues. Table 1 demonstrates that, compared to preharvest selling, producers who sold at harvest realize equal or better prices. Furthermore, those who adopted a delayed pricing strategy, waiting to sell until November, achieved even higher returns. This underscores the potential benefits of waiting to sell at or after harvest during periods of supply constraints and high demand. It also highlights the tradeoffs with preharvest marketing. By locking in a price earlier in the season, producers using these strategies give up some of the price gains that could have been realized later in the season.

When Selling Several Months after Harvest May Underperform

In periods characterized by low demand and abundant supplies, the effectiveness of a delayed pricing strategy significantly diminishes. For example, in the 2008 crop year wheat production reached the highest levels in the study period (Figure 2). Coinciding with this, the 2008 financial crisis lowered global economic growth and thus wheat demand. After peaking at a record-high level in March 2008, wheat prices declined for over two years. While strategies involving preharvest sales managed to secure higher prices than selling at harvest, the delayed pricing approach failed to do so.

A similar situation occurred for crops harvested between 2014 and 2016. During this period, there was a relative abundance of supply while demand remained flat. Prices predominantly declined. This trend underscores the potential weaknesses of the delayed pricing strategy in scenarios where supply is high but demand is stagnant or declining.

It is worth noting that we assume a monthly storage rate of $.025/bushel. Costs to store may be higher in practice and/or come with additional fees that would significantly change the presented results. In practice, a producer could decide whether to use this strategy by looking at the carry in the futures market (the difference between the nearby and a deferred contract). When the deferred contract exceeds the nearby contract by a significant margin (much higher than the storage cost), storing and selling at a later date through delayed pricing contracts could lead to higher prices. However, the delayed pricing strategy also adds cash flow considerations and results in added risks, like not knowing what prices will be in a few months. When using this strategy, establish a new hedge to protect upcoming sales against an unforeseen price decline.

Conclusion

Results from comparing the outcomes of six marketing strategies indicate that selling before harvest, as well as selling three months after harvest, generate favorable results compared to the benchmark strategy of selling at harvest long-term. The key takeaway is that a producer who employs price risk management strategies is likely to obtain a higher long-run average price compared to simply selling at cash price at harvest.

In years characterized by "normal" market conditions where price generally declines into harvest, we see the benefits of preharvest hedging highlighted. Although preharvest marketing may not always result in the highest price, particularly in years with tight supply, an intangible benefit of locking in prices early is peace of mind regarding revenue. Over the past two years, wheat prices have exhibited significant volatility while input costs have risen. Predicting market outcomes is challenging and those who choose to sell a portion of their crops early in the season, even if it means forgoing potential further gains, can secure prices with the confidence that their bottom line will be protected.

Although delayed pricing generated the highest average prices overall, its advantage over preharvest strategies was primarily driven by a few years of exceptionally tight supply. During periods of low demand and abundant supplies, the effectiveness of a delayed pricing strategy diminishes significantly. Moreover, given the uncertainty in selling prices, employing a new hedge on December futures contracts may be necessary to protect against potential price declines.

Considering the overall performance, preharvest marketing, especially through average pricing, emerges as the most favorable option. This strategy offers the best balance between mitigating price uncertainty and achieving competitive prices.

Our analysis is subject to several important considerations. While commissions and related service fees are typically negligible for most medium to large producers, they were not factored into our analysis. For instance, HTA fees can range from zero to a few cents per bushel, depending on the months involved in the hedging. Futures trading costs can be as low as $5 per contract (for 5,000 bushels) per round trip. Including these costs is unlikely to alter our results significantly. However, margin calls associated with hedging using futures contracts may pose a concern. Bona fide hedgers who meet Commodity Futures Trading Commission requirements qualify for reduced hedger margins, but the required margin for positions can still be substantial and may impact a producer's cash flow. These two points should be addressed when devising marketing strategies. Finally, there is no one-size-fits-all approach when it comes to marketing. Consequently, producers should carefully consider their cash flows, farm financial situation, risk attitudes, and other relevant factors when designing marketing strategies.

Further Reading

Etienne, X, and T. Hand. 2023. *Back to Basics: Hedging and Basis in Grain Marketing* (BUL 1058). Moscow, ID: University of Idaho Extension. 8 p. https://www.uidaho.edu/extension/publications/publication-detail?id=bul1058.

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United States Department of Agriculture National Agricultural Statistics Service. 2023. "Quick Stats." https://quickstats.nass.usda.gov/.

Appendix

(1) The cost of production data is obtained by combining the Idaho dryland hard red winter (HRW) and soft white winter (SWW) wheat crop budgets compiled by the University of Idaho and the Commodity Cost and Returns dataset from the USDA. The U of Idaho HRW and SWW crop budgets specifically reflect the cost of production in Idaho, but they are only available for selected years. Meanwhile, the USDA dataset provides annual average costs at the national level continuously. In cases where the U of Idaho data is not available, we estimate the Idaho-specific operating costs by comparing the two datasets and extrapolating Idaho costs using the USDA data. For the year 2019, the estimated operating cost per bushel for HRW and SWW is $2.87 and $3.14, respectively, which serves as the basis for calculating production costs for all the years analyzed. It should be noted that the actual cost of production may vary significantly for different producers.

(2) The cash prices reported by USDA NASS are for winter wheat, which includes both HRW and SWW. We have run the same analysis for both types of wheat. For soft white, Chicago soft red wheat futures contract and the estimated SWW cost data are used, the results of which are reported in the main text. For hard red, we use Kansas City HRW futures and the estimated HRW wheat cost. See below for the results. Our main conclusions remain the same except for (3) and (5), where those strategies resulted in a greater number of years with higher prices compared to the benchmark strategy.

Appendix Table 1. Comparison of marketing outcomes for Idaho winter wheat producers (Kansas City HRW September futures contract), in $/bushel, 2000–22 crop year.

Crop Year	(1) Taking Harvest Bids	(2) Average Pricing	(3) Time and Price	(4) Basis Speculation	(5) Stepped Price Target	(6) Delayed Pricing
2000	2.19	2.27	2.19	2.19	2.19	2.33
2001	2.94	3.14	3.20	2.94	3.06	3.15
2002	3.54	2.76	2.60	3.87	2.67	3.93
2003	3.25	2.95	2.87	3.25	3.16	3.17
2004	3.55	3.94	4.11	3.55	4.12	3.39
2005	3.08	3.05	3.08	3.08	3.10	2.96
2006	3.42	3.31	3.42	3.42	3.42	4.16
2007	5.27	3.96	3.57	5.27	3.58	6.61
2008	7.41	8.07	7.90	7.89	8.56	6.79
2009	4.81	5.51	5.74	5.15	5.44	4.29
2010	4.79	3.72	3.39	4.79	3.92	5.64
2011	6.74	6.79	7.16	6.74	7.18	6.50
2012	7.58	6.62	6.18	7.58	6.30	8.22
2013	6.87	7.30	7.37	7.21	7.40	6.91
2014	6.25	6.80	7.34	6.37	7.21	5.96
2015	5.69	6.25	6.19	5.49	6.31	5.11
2016	4.07	4.75	4.39	4.31	4.07	3.78
2017	4.11	4.56	4.11	4.11	4.11	4.26
2018	4.98	5.05	5.07	4.98	4.98	5.09
2019	4.95	5.52	5.46	4.88	5.17	4.97

Appendix Table 1. Comparison of marketing outcomes for Idaho winter wheat producers (Kansas City HRW September futures contract), in $/bushel, 2000–22 crop year, cont.

Crop Year	(1) Taking Harvest Bids	(2) Average Pricing	(3) Time and Price	(4) Basis Speculation	(5) Stepped Price Target	(6) Delayed Pricing
2020	4.70	4.73	4.87	4.93	4.70	5.00
2021	5.84	5.31	5.29	5.84	5.54	7.51
2022	7.78	8.16	9.11	7.78	8.52	8.42
Average Price	4.95	4.98	4.98	5.03	4.99	5.13
Standard Deviation	1.57	1.71	1.85	1.61	1.83	1.69
Minimum Price	2.19	2.27	2.19	2.19	2.19	2.33
Maximum Price	7.78	8.16	9.11	7.89	8.56	8.42
% Price > Strategy 1	---	65%	57%	30%	47%	61%
% Price ≥ Strategy 1	---	65%	70%	91%	70%	61%

Notes: *Price represents the final net price received per bushel for winter wheat producers in Idaho. We assume a storage cost of $0.025 per month in computing the final price received under the delayed pricing strategy. Shaded cells represent years when the respective strategy yields higher net prices than the base strategy of taking harvest bids. Cash prices were sourced from USDA NASS (2023) and futures prices were sourced from the Kansas City Board of Trade via the Bloomberg Terminal.*