ECONOMICS OF POTATO STORAGE MANAGEMENT

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by

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INTRODUCTION

It is no secret that it costs a lot of money to produce and harvest a crop of potatoes. Unless the crop is sold out-of-the field, costs continue to mount after harvest. These after-harvest storage costs can mean the difference between a money-making year and a money-losing year.

Just like the costs of growing potatoes, the costs of storing potatoes can vary over a wide range. Some costs, such as depreciation and taxes, are beyond the control of the manager. Other costs, such as labor and shrink, can be controlled to some degree by the manager.

STORAGE COSTS

In order to better understand storage costs, let's look at an example storage cost worksheet. Table 1 was originally prepared by an Idaho Falls grower with the assistance of the Extension Service for the 1981-82 storage season. It was a dirt-and-timber storage with an air system and a 60,000 cwt capacity. The costs were adjusted to 1984 and would be comparable this year except for the $5.00 per cwt harvest-time price.

The worksheet was for a five-month storage season. Costs would be different for shorter or longer storage. For example, the cost of sprout inhibitor chemicals would not be incurred if the crop was sold in early winter, or would be incurred twice if held to late spring. A grower could calculate the monthly storage costs and add this to the harvest price to determine break-even potato price for each month. That is exactly what was done to construct the break-even potato prices at the bottom of Table 1. While a grower should be aware of his total storage costs, a decision on whether to store this years crop and how long to store it should be based only on recovery of the variable costs. This does not mean the grower can ignore the Fixed Costs. These costs will have to be recovered over the life of the storage facility.

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Accurate storage cost information can help growers make a number of important management decisions. The most basic, of course, is whether to store any of the current crop. In addition to cost, that decision should also be based on other factors such as price expectations and the difficulties of harvest-time marketing. Once an open-market crop is in storage, however, the decision of 'when to sell' must be made. Seasonal price peaks and troughs have often been several dollars per hundredweight above and below the harvest-time price. For many growers, hundreds of thousands of dollars are riding on the 'when to sell' decision.

MANAGEMENT EFFECT ON COSTS

It is not only timing of marketing decisions that can change a grower's profits by hundreds of thousands of dollars. Storage management can also affect the bottom line by that same amount of money. In the worst cases, entire cellars full of potatoes have been lost because of poor management of inadequate facilities to handle a specific problem. Back East, frost-damaged or blight infected potatoes have literally melted and ran out the storage doors.

Shrink, or loss of water weight, is a natural function of potato respiration during storage. The quality of the crop going into storage is an important factor in storage shrink but there are also management factors that the grower can control. Indeed the grower has some control over the quality going into storage. Tubers bruised during the harvest operation deteriorate more rapidly during storage than do healthy potatoes.

About ten years ago Walt Sparks of the Aberdeen Experiment Station published some research results on the economics of storage practices. His focus was on the effect that fan operation and humidity maintenance had on weight loss and quality change due to rotted, flattened, shriveled, and sprouted potatoes. Quality change was certainly verified by Professor Sparks. Placing a dollar value on this change, however, can be difficult with the wide variation in pricing procedures that exist in Idaho. Some buyers bid a flat price for a lot of potatoes, with little or no adjustment for grade-out or quality, while others include very specific premiums, discounts and tares.

Table 2 was derived by using Professor Sparks' weight loss information along with storage costs from Table 1 and a harvest-time price of $4.00 per cwt. The recommended storage management practices, intermittant fan and 95% relative humidity, resulted in significantly lower storage costs than the practices that Sparks found prevalent in the 1970's. Table 3 was calculated using the same data as Table 2, but using a $3.00 per cwt harvest-time price. While the difference was not as great as found in Table 2, it is still significant. Regardless of the price, good storage management pays. This

season it might be easier to pick up an extra 10 or 20 cents per cwt by properly managing a storage rather than by trying to out-guess the market.

CONCLUSION

It doesn't matter if you grow for the open market or contract and it doesn't matter if you grow for the seed, fresh, or processed market, storage management decisions will affect the profitability of your potato operation. Most growers pay meticulous attention to their crops while they are in the field. The profit-minded growers also pay meticulous attention to their crops in storage.

Table 1. Potato Storage Cost Worksheet

1. Quantity Stored: 60,000 cwt
2. Price at Harvest: $5.00/cwt
3. Harvest-Time Value: $300,000

I.	Fixed Costs - Storage Ownership Costs:		$9,585
	A. Depreciation and Interest:	$8,540	
	B. Taxes and Insurance:	$1,045	
II.	Variable Costs - Storage Operating Costs:		$9,597
	A. Chemicals:	$3,100	
	B. Electricity:	$ 887	
	C. Labor:	$1,260	
	D. Maintenance:	$1,350	
	E. Piler Rental:	$3,000	
III.	Interest On Stored Potatoes - 5 mo.:		$15,000
IV.	Storage Shrink Cost (non-cash):		$14,004

Total Cost: $48,186 Cost/ cwt: $.84

Price Required to Offset Storage Costs:

	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN
Total (I+II+III+IV)	5.42	5.51	5.65	5.75	5.84	5.99	6.11	6.23
Variable (II+III+IV)	5.26	5.35	5.49	5.58	5.67	5.82	6.94	6.06

Table 2. EFFECT OF MANAGEMENT PRACTICES ON STORAGE BREAK-EVEN PRICES: $4.00

Month	95% Rel. Humidity Intermittant Fan	85% Rel. Humidity Continuous Fan	Difference
Nov	$4.32	$4.38	$.06
Dec	4.38	4.47	.09
Jan	4.48	4.58	.10
Feb	4.53	4.66	.13
Mar	4.60	4.74	.14
Apr	4.71	4.87	.16
May	4.78	4.96	.18
Jun	4.85	5.04	.19
Jul	4.92	5.13	.21

Table 3. EFFECT OF MANAGEMENT PRACTICES ON STORAGE BREAK-EVEN PRICES: $3.00

Month	95% Rel. Humidity Intermittant Fan	85% Rel. Humidity Continuous Fan	Differences
Nov	$3.31	$3.35	$.04
Dec	3.35	3.42	.07
Jan	3.44	3.52	.08
Feb	3.48	3.57	.09
Mar	3.53	3.64	.11
Apr	3.63	3.75	.12
May	3.68	3.82	.14
Jun	3.73	3.88	.15
Jul	3.79	3.95	.16