



The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

No endorsement of AgEcon Search or its fundraising activities by the author(s) of the following work or their employer(s) is intended or implied.

Loan Deficiency Payments or the Loan Program?

Dermot J. Hayes and Bruce A. Babcock

Briefing Paper 98-BP 19
September 1998

**Center for Agricultural and Rural Development
Iowa State University
Ames, Iowa 50011-1070
www.card.iastate.edu**

Dermot Hayes and Bruce Babcock are professors in the Department of Economics, Iowa State University.

This paper is available online on the CARD Web site: www.card.iastate.edu. Permission is granted to reproduce this information with appropriate attribution to the authors.

Questions or comments about the contents of this paper should be directed to Bruce Babcock, 578 Heady Hall, Iowa State University, Ames, IA 50011-1070; Ph: (515) 294-6785; Fax: (515) 294-6336; E-mail: babcock@iastate.edu.

<p>Iowa State University does not discriminate on the basis of race, color, age, religion, national origin, sexual orientation, gender identity, sex, marital status, disability, or status as a U.S. veteran. Inquiries can be directed to the Director of Equal Opportunity and Diversity, 3680 Beardshear Hall, (515) 294-7612.</p>
--

LOAN DEFICIENCY PAYMENTS OR THE LOAN PROGRAM?

Low market prices for corn and soybeans have triggered two federal price support programs.

- One is a Loan Deficiency Payment (LDP) that pays producers the difference between county level prices (posted county prices) and that county's loan rate on a date chosen by the producer (so long as the producer still owns the grain).
- The second program is the traditional loan program whereby the producer puts grain in storage and uses the grain as collateral on a loan. The producer receives the county-specific loan rate for all bushels he or she puts into storage under this program. If market prices exceed the loan rate plus accrued interest within nine months, the producer can repay the loan and sell the crop. If this price increase does not occur, the producer can keep the difference between the loan rate and the posted county price on the day of sale. That is, the producer repays the loan at a price that is lower than the loan rate.

What should you, as a producer, do? You can enroll in the loan program, or you can take a LDP, but you cannot do both. If you take the LDP you can sell the grain at harvest, store it at your own risk, or store it and contract for future delivery. If we knew for sure what the

markets were going to do in the coming months, then there would be a single best answer. Without the benefit of perfect foresight, we must deal with probabilities. We can use existing information to say what is most likely to be the correct response.

Consider a producer in Union County, Iowa who has 10,000 bushels of corn. The loan rate in Union County is \$1.77 per bushel. Suppose that at harvest, the cash price is \$1.69, the December futures is at \$1.99, and the July futures is at \$2.25. (All of these prices were accurate representations of expected conditions at harvest in Union County as of Sept 1, 1998.) For the sake of simplicity, assume that the local price is measured accurately by the posted county price and that this price is always \$.30 below the nearby futures price. At these prices, storage is encouraged. There is a 26 cent return from storing grain from harvest to July. Typical storage costs of one cent per bushel per month implies a net return to storage of 17 cents per bushel.

Choice One

Sell at harvest and take the LDP or use the loan program.

If you sell at harvest, you get the county price plus the LDP. Together this will equal the loan rate. Alternatively you can guarantee yourself this same amount by putting the grain under loan in the loan program. The difference between these options is that

selling at harvest means that you will be out of the market, whereas putting the grain under loan allows you to benefit if market prices increase to a level above the loan rate, plus interest. This option of selling at a higher price, combined with the price guarantee of the loan rate means that you will always be better off storing the grain under loan than selling cash grain and taking the LDP and selling cash grain. In other words, being in a position to benefit from upside price movements without having to worry about downside movements is better than not being in the market.

We can go further and actually put values on these two outcomes. If you take the LDP and sell at \$1.69, you get \$1.77 per bushel or \$17,700 for the 10,000 bushels. If you put the grain in the loan program, you will also get \$17,700; however, you also will have some possibility of making more if market prices strengthen. Using option pricing theory (the loan program is equivalent to a free put option) and current option quotes, we have calculated this additional value to be \$2,229. In other words, the total expected payout from the loan program is \$19,929 versus a value of \$17,700 from selling today and taking the LDP.

Choice Two

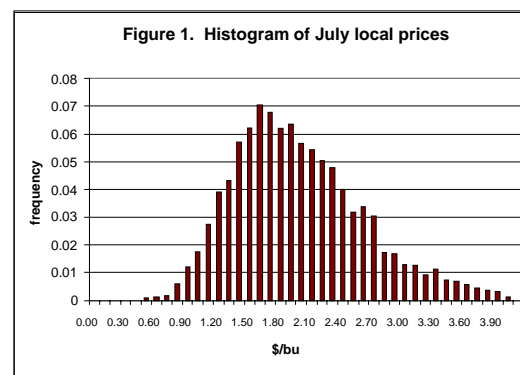
Use the loan program or take the LDP and store at your own risk.

The loan program clearly dominates the cash sale option. But the producer could choose to take the LDP and store the grain outside of the loan program. The comparative advantage and disadvantage of the loan program versus

this private storage option is less straightforward.

The private storage option allows the producer to take full benefit of the LDP *and* to take full advantage of any market price increase. In fact, if the producer knew that prices were going to strengthen, then private storage works better than the loan program. However, if prices fall, then the opposite will be true. While we cannot say for sure which decision is best, it is possible to assign probabilities to various price outcomes and compare the expected values of each of the two alternatives.

Figure 1 illustrates what the futures and options markets are telling us about local prices in July. The horizontal axis reports the prices that are possible. The height of the bar shows us the chances that a certain price will materialize. As can be seen, the futures market is telling us that local prices around \$1.95 are most likely, with low chances of prices above \$2.70 or below \$1.20.



Using these price distribution in figure 1 and accounting for storage costs, the expected value of the private storage option is \$19,400 compared to \$19,929 under the loan program. This comparison would favor the loan

program by an even greater amount if we adjusted these outcomes for the additional risk associated with the private storage option. That is, under the private storage option, you would be exposed to the full effect of a price drop to \$1.20 per bushel, whereas under the loan program, you would receive the loan rate of \$1.77.

Note that many producers plan to utilize the private storage option because they believe that the government will not allow market prices to fall much further or because they believe that the July futures is going to rise. This decision turns the farmer into a speculator. Many who plan to follow the private storage route would be uncomfortable selling put options or going long on the Chicago Board of Trade July futures, yet they will expose themselves to exactly as much risk under private storage. This does not mean that speculation is wrong; indeed market outcomes may show that the private storage option was the correct course to follow. It does, however, argue that farmers should not confuse speculation with risk management.

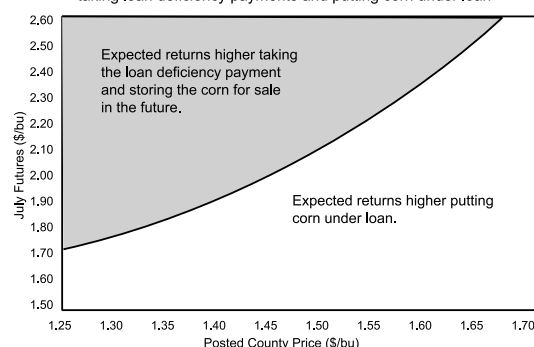
Choice 3

Use the loan program or take the LDP, store, and lock in a futures price.

An alternative to private storage is to take the LDP and store the grain, but then use the futures market to lock in a July price. If the futures market allows you to “sell” the privately stored grain at a July price that is greater than the loan rate, then you could take the LDP and secure an advantage of the relatively high futures price.

Whether or not this option returns more than the expected value of putting the grain under loan depends on the July futures quote in comparison with current cash prices. When the July futures is close to the current price it will not be possible to lock in a premium, and the loan program will dominate. When the July futures is much higher than current cash markets, then taking the LDP and locking in a July price may return more than using the loan program. Figure 2 makes this comparison for a wide range of July futures and local prices.

Figure 2. Chicago futures prices that equalize the expected returns from taking loan deficiency payments and putting corn under loan



The comparison shown in Figure 2 is relevant to situations outside of Union County and for a much wider range of prices than those used in the introduction. For example, the extreme left-hand value shows a local price of \$1.25, (this corresponds to a nearby futures price of \$1.55). At this price, then, a July futures price above \$1.70 will make it worthwhile to stay out of the loan program. At any July price below this value, the loan program will dominate. If the local price is \$1.65 (corresponding to a nearby futures price of \$1.95), then the break-even July futures is \$2.60. Although this seems like a large differential, we must add to

the posted county price the cost of storage, the expected basis, and the market value of the implicit put option that comes with the loan program.

It is unusual for the futures market to show a large enough storage premium to make it worthwhile to take the LDP and lock in a futures price. However, the federal government may decide to

artificially force down posted county prices in order to make the LDP a more attractive option. Figure 2 shows what the differential needs to be in order to make the posted county price a more attractive option than the loan rate.