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DEFERRED PRICING ALTERNATIVES FOR GRAIN

Producer Marketing Management — Fact Sheet #2

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Grain producers must make marketing decisions every day. First they must decide whether to price or hold grain. If they decide to price grain, they must then choose the most appropriate method of pricing — cash sale, forward contract, or hedging. If they decide to hold grain (not to price), they must choose the most appropriate method of retaining ownership. This fact sheet presents some guidelines to help producers choose the least costly method of owning grain or speculating on price level changes.

At least two methods of holding grain may be available to a producer. The first and most obvious method is to retain ownership of the grain. For the period following harvest, the producer stores the grain and incurs the cost of that storage. For grain commodities that are traded on the futures market, the producer can use an alternate method and buy a futures contract to replace cash grain sales. In this case, the producer owns a futures contract rather than the actual stored grain; the concept is the same, however, because in both instances the producer is retaining ownership in anticipation of higher prices. By owning grain, the producer is speculating on higher cash prices; by owning futures, the producer is speculating on higher futures prices.

Deferred pricing

Some grain buyers also offer producers the opportunity to price grain some time after delivery or some time after the title of the grain has passed to the buyer. These deferred pricing arrangements are alternative methods of speculating on price level changes. Even though ownership of the grain is transferred to the buyer, the producer retains the opportunity to benefit from higher prices. Of course, the producer also runs the risk of lower prices, just as with ownership of grain or futures. There are basically two forms that deferred pricing arrangements can take: a basis contract and a delayed pricing contract.

Basis contract

Under a basis contract, the buyer and seller agree that the price paid to the seller will be the price of a specified futures contract at a time chosen by the seller, minus the basis that exists at the time the basis contract is drawn. In other words, the basis is fixed at the time of the contract, but the seller retains the right to price the grain at a later date. A final date for pricing is established in the contract, as may be provisions for extending the pricing period. At the time the contract is made, ownership of the grain is transferred to the buyer and the timing of delivery is specified. If the grain is delivered before it is priced, the buyer often pays the seller 75 to 80 percent of the cash price at the time of delivery. The final settlement is made at the time the producer prices the grain.

From the producer's standpoint, a basis contract provides the same opportunity as a futures contract because in both instances the producer is speculating on futures prices. If futures prices go up, the producer receives a higher net price; if futures prices go down, a lower net price. With futures contracts, the producer has to meet margin requirements on the futures account. Those margin requirements will increase if futures prices decline. With a basis contract, the producer does not have to meet margin requirements; however, if prices decline sufficiently, the producer may have to refund some of the initial payment.

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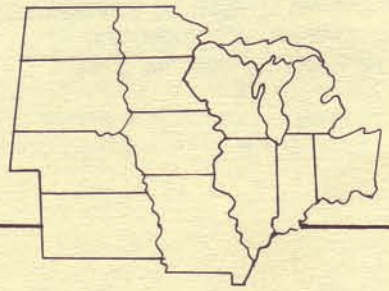

The basis contract is an indirect method of replacing cash grain sales with futures contracts. The buyer of the grain sells the cash grain at the time of the contract and buys a futures contract. When the producer prices the grain, the buyer sells the futures contract. The buyer is actually doing the futures trading for the producer, and sometimes may charge a small fee for that service.

Delayed pricing contract

Another way to defer the pricing decision beyond delivery is to use the delayed pricing contract. Under this arrangement, the producer delivers grain to the buyer and transfers title of the grain to the buyer but retains the right to price the grain at a later date. The producer can choose the pricing date within the time constraints specified in the contract. The price paid to the seller on the day of pricing is the buyer's bid price on that day minus accrued service charges.

The delayed pricing contract differs from the basis contract in that a schedule of service charges, rather than the basis, is agreed to, and the price the producer receives is based on the cash price rather than on the futures price. With both a delayed pricing contract and a basis contract, the producer gives up title to the grain at the time of delivery or at the time of the contract. With a delayed pricing contract, the buyer usually does not make a payment to the producer at the time of delivery. If for any reason the buyer of the grain encounters financial difficulties, the producer may have a lower probability of receiving full payment. Although this risk is also associated with basis contracts, in most cases with basis contracts the producer would have already received a partial payment at the time of delivery.

The service charges for a delayed pricing contract vary, depending on how the buyer handles the grain. If the buyer stores the grain until the producer prices it, the service charge may be very similar to the buyer's storage charges. But even though the charges may be similar, the buyer is not actually storing grain for the producer, because the buyer owns the grain. If the grain is stored in temporary facilities or on the ground, the service charge may also include a charge for quality risk.

In most cases, delayed-price grain is not stored by the buyer but is sold and moved on through the marketing channel. The buyer can sell the grain to someone else, such as a terminal, on a delayed pricing contract and pass along the service charges of the terminal to the producer. If the buyer sells the grain in the cash market, the service charges will reflect the cost of replacing that cash sale with a long position in the futures market. In other words, a buyer who sells delayed-price grain before the producer prices it is open to substantial price risk. By buying futures, the buyer eliminates the price risk but takes on a basis risk, and the service charge must then reflect the anticipated improvement in the basis. The service charge should reflect anticipated basis improvement minus interest income that can be earned on the selling price of the grain.

The method by which the producer chooses to speculate on price change will depend on which alternatives are available, whether the producer is willing to use the futures market, and the relative cost of the available alternatives. In general, producers should be expected to choose the method that has the lowest expected cost.

Cost analysis

With commercial storage, the cost of holding grain includes the warehouse cost and the interest on the value of the grain. For some grains, the moisture level is reduced below the standard level before it is stored. In those instances the cost of ownership would also include the additional cost of drying and the cost of the additional shrinkage associated with that drying. Once grain has been stored and the additional costs incurred, those costs will not influence future decisions.

With on-farm storage, the warehouse cost may be more difficult to calculate. In the long run, the cost includes the overhead cost of the storage facility, that is, interest on investment and depreciation. If facilities already exist, those costs will be incurred whether or not the facilities are used, and they are not necessarily included in the calculation of cost. The producer also has the cost of maintaining grain quality in farm storage facilities.

If a producer chooses to replace a cash grain sale with a futures contract as a way of retaining ownership, the cost items are entirely different from storage cost items. The direct costs of this method are associated with the futures transactions, that is, with maintaining a margin account and paying the commission fees. There is also an indirect cost, or an opportunity cost, associated with owning futures. Since the producer has moved ownership from the cash market to the futures market, benefits accrue only if the *futures* price increases. Any improvement in the cash price resulting from an improvement in the basis does not benefit the producer. Therefore, any improvement in the basis after the cash sale is an opportunity cost to the producer in that the producer would have gained from that improvement if grain ownership had been retained.

The cost of a basis contract is very similar to the cost of replacing cash grain with futures. The major cost item is the basis improvement, if any, after the contract is drawn. There is also interest cost on the unpaid portion of the cash price at

the time of delivery, and there may be a small charge by the buyer for this service. This charge normally takes the form of fixing the basis at a level 2 to 3 cents less than the current basis.

Estimating the cost of a delayed pricing contract is a very straightforward procedure. The cost includes the service charge and interest on the value of the grain at the time of delivery.

A producer faced with a number of alternative methods of owning grain or speculating on price change needs to estimate the cost of each method before making a decision. To the right is a checklist of cost items that should be estimated for each of the alternatives described. Most of these cost items are easy to estimate.

With commercial storage, the local elevator storage rate is readily available. The monthly interest cost on the value of the grain is the current rate of interest (borrowing rate) times the price of grain divided by 12. The total interest cost, then, is the monthly cost times the number of months stored. The extra drying and shrinkage cost is the number of points of moisture removed times 1.3 (or the elevator's shrink factor) times the price of grain plus the cost of drying. The service charges for basis contracts and delayed pricing contracts are announced by the buyer.

The cost of the futures account includes commission fees plus interest on margin money. The initial margin is known at the time the account is opened. The size of the maintenance margin depends on the direction of subsequent price moves. A downward move after futures are purchased would require an additional margin, and a price increase would result in a cash inflow to that account.

The biggest uncertainty surrounds the estimate of potential basis improvement, if any. Making this estimate is essential to evaluating the basis contract and replacing grain sales with futures contracts. The producer must judge how much the basis will change from the time of the initial transaction (basis contracts or buying of futures) until the final transaction. Knowledge of past basis patterns is extremely useful in making these estimates. Generally, the weaker the basis at the time of the initial transaction, the greater the potential improvement in the basis.

The decision to own grain is a speculative decision. The producer can make very sound judgements about the relative cost of ownership and choose the least expensive method. However, there is no guarantee that ownership in any form will be profitable.

The best way to illustrate the process of choosing the least-cost method of holding grain is to use examples of recent situations. Corn will be used to illustrate the process, and prices and costs will be those of south central Illinois. The two time periods will be harvesttime 1982 and harvesttime 1983. These two years were selected because they are recent and because they illustrate dramatically different price relationships. Prices at harvesttime in 1982 were low and the basis was relatively weak, although not as weak as in previous years. Prices at harvesttime in 1983 were high, the basis was very strong, and the futures market was inverted (December futures above July futures). The 1982 corn crop was record large, and the 1983 crop was the smallest it had been since 1970.

Checklist of Ownership Costs

	Method of ownership				
Cost item[a]	Commercial storage	On-farm storage	Sell cash, buy futures	Basis contract	Delayed pricing contract
	cents per bushel				
Warehouse	√	√			
Interest	√	√		√	√
Extra drying and shrinkage...	√	√			
Extra handling and shrinkage...		√			
Quality maintenance		√			
Basis improvement			√	√	
Futures account...			√		
Service charge				?	√

Example 1

Table 1 illustrates the weekly price and basis pattern for the 1982 corn crop. The period covered is February before harvest through July after harvest. The cash price before harvest is the contract price for harvest delivery. Prices from late September forward are spot cash prices. The basis is calculated as the cash price minus the futures price for three futures contracts: December, March, and July.

In this example, it is assumed that at harvesttime a producer was deciding on the least costly method of owning corn. The cost of each of the five alternatives for "owning" corn from September 30, 1982, to the end of February 1983 is described in the following sections and is summarized in Table 2.

Commercial storage

In the case of commercial storage, a warehouse cost of 12 cents per bushel until January 1 and 1.5 cents per bushel per month after

Table 1. South Central Illinois Corn Basis, 1982 Crop

Thursday date	Cash price[a]	Basis[b] Dec	Mar	Jul
1982				
Feb 4	260	−47	−58	
11	258[2]	−45	−57	
18	255[2]	−45	−58[2]	
25	249[2]	−43	−57[2]	
Mar 4	248[2]	−43	−57	
11	244	−42	−56	
18	246[2]	−41[2]	−54[2]	
25	247	−42[2]	−54	
Apr 1	251	−42[2]	−55[2]	
8	259	−40	−52[2]	
15	257	−40	−53[2]	
22	255	−40	−53	
29	255	−40	−60[2]	
May 6	245	−40	−60	
13	243[2]	−39[2]	−53	
20	248	−38[2]	−51	−68
27	242	−38[2]	−51[2]	−67
Jun 3	238[2]	−38	−52	−69
10	241	−38[2]	−52	−68
17	235	−36	−50	−66
24	236[2]	−38	−53	−69[2]
Jul 1	231[2]	−38	−52	−69
8	229[2]	−34	−48	−62[2]
15	230	−34[2]	−49	−63
22	225	−34	−48	−62
29	217	−36[2]	−52	−67[2]
Aug 5	218	−33	−49	−65[2]
12	196	−37	−54	−72
19	190[2]	−37	−52[2]	−68
26	197[2]	−24	−50	−66
Sep 2	199[2]	−32	−48	−64
9	188	−33[2]	−50	−66
16	193	−31	−47[2]	−64
23	190[2]	−31[2]	−48	−65
30	191	−42	−47	−64
Oct 7	197	−27	−42	−59
14	194	−28	−43	−61
21	192	−29	−43[2]	−61[2]
28	197	−20[2]	−33	−49
Nov 4	208	−14	−25	−38
11	226	−11	−22	−32
18	229[2]	− 7[2]	−16[2]	−29
25	230[2]	− 9	−15	−28[2]
Dec 2	225	− 6	−12	−25
9	227[2]	− 8	−15	−30
16	225	− 8	−16	−30
23	—[c]			
30	—			
1983				
Jan 6	226[2]		−19	−35
13	232		−22	−39[2]
20	234[2]		−21	−38[2]
27	247[2]		−19	−36
Feb 3	255		−13	−29
10	257[2]		−16	−31
17	266		−12	−30
24	270		− 9[2]	−27
Mar 3	273[2]		− 7	−21
10	269		− 6	−20
17	278[2]		− 8[2]	−24[2]
24	291			−21[2]
31	303			−14
Apr 7	301[2]			−15[2]
14	308			− 8[2]
21	304[2]			− 5[2]
28	311			− 5[2]
May 5	313			− 5
12	297[2]			− 5
19	304[2]			+ 2
26	308			+ 2
Jun 2	313			+ 6
9	318[2]			+ 9
16	313[2]			+ 4
23	317[2]			− 1
30	313[2]			− 4[2]
Jul 7	322			− 4
14	322			− 7

[a] Source: Illinois Department of Agriculture.
[b] Cash price minus the appropriate futures price.
[c] No price reported.

Table 2. Cost of Owning Corn from September 30, 1982, to February 24, 1983

Cost item[a]	Method of ownership				
	Commercial storage	On-farm storage	Sell cash, buy futures	Basis contract	Delayed pricing contract
	cents per bushel				
Warehouse	15.00				
Interest	11.94	11.94		2.39	11.94
Extra drying and shrinkage...	6.72	6.72			
Extra handling and shrinkage...		3.00			
Quality maintenance....		1.00			
Basis improvement			37.50	37.50	
Futures account...			0.10		
Service charge				2.00	25.50
TOTAL.....	33.66	22.66	37.60	41.89	37.44

[a] See text for explanation and calculation of cost.

that is assumed, resulting in a total cost of 15 cents per bushel. Five-month interest at 15 percent on the cash price of $1.91 results in a total cost of 11.94 cents per bushel. The cost of extra drying and shrinkage is based on the assumption that corn was dried to 14 percent moisture rather than to 15.5 percent. The shrink factor was 1.3 percent for each point of moisture removed, and the drying cost is assumed to have been 2 cents per point of moisture removed. The cost, then, was 6.72 cents per bushel [(1.5 x .013 x $1.91) + $0.03]. Under these conditions the total cost of storing grain in commercial storage for 5 months was 33.66 cents per bushel. The producer knew this cost with certainty before making the storage decision.

On-farm storage

In the case of on-farm storage, it is assumed that facilities were in place and that the costs included only those associated with using those facilities. In addition to interest, they included the cost of extra drying and shrinkage, the cost of one extra handling of the grain (including some additional shrinkage), and the cost of maintaining the quality of the grain (stirring and/or aeration). The costs of on-farm storage could have varied considerably, particularly if the corn had been overdried or had gone out of condition. In this example, the total cost is estimated at 22.66 cents per bushel.

Sell cash, buy futures

The cost of replacing cash grain sales with futures contracts was the cost of maintaining a futures account plus the improvement in the basis, if any, after September 30. An initial margin deposit of $1,000 and a commission fee of $50 are assumed. The interest cost on that initial margin at 15 percent interest for 5 months totaled $62.50. However, the March futures price increased about 47 cents from November 1, 1982, to the end of February 1983. Assuming a 5,000-bushel futures contract, interest earned on money coming into the margin account as a result of the price increase would have totaled about $117.50. The producer had a net earnings on interest on margin money of $55 ($117.50–$62.50). These earnings were just about offset by the $50 commission fee. The net cost of the futures account was only $5.00, or 0.1 cent per bushel.

Assuming further that the producer bought March futures on September 30 and sold March futures on February 24, the basis improvement totaled 37.5 cents per bushel. The producer did not know this cost with certainty before making the decision and would have had to project the basis change from September 30 to February 24. Past basis patterns would have been used in making that projection.

Basis contract

The cost of the basis contract included the improvement in the basis from September 30 to February 24, the interest on the portion of the price not received on September 30, and any service charge assessed by the buyer for the service provided. The basis improvement was 37.5 cents, and we assume a service charge of 2 cents per bushel — that is, we assume that the contract was written at 49 cents under March futures, rather than at the 47 cents that actually existed on September 30. It is assumed that the buyer paid 80 percent of the price on September 30, so that interest cost was associated with the unpaid balance of 38.2 cents (20 percent of $1.91). Interest cost totaled 2.39 cents per bushel. Again, the producer would have had to forecast the basis improvement from September 30 to February 24 when choosing the most appropriate alternative in September.

Delayed pricing contract

The cost of a delayed pricing contract consisted of interest on the value of the corn as of September 30 and the service charge assessed by the buyer. As described earlier, the magnitude of the service charge would have been a function of how the buyer handled the grain. We assume that the buyer sold the grain and replaced it with March futures. In this case, the buyer would have

had to anticipate the basis change and structure service charges accordingly. The service charge would have been adjusted (reduced) by the amount of interest the buyer earned on the selling price of corn on September 30. If the basis change was correctly anticipated, the service charge would have totaled approximately 25.5 cents per bushel (37.5 cents basis improvement minus about 12 cents interest income). The producer would have known the total cost of the delayed pricing contract with certainty before making the decision.

In this example, replacing cash with futures, using a basis contract, and using a delayed pricing contract were the most expensive methods of owning grain because the basis was relatively weak at harvesttime and strengthened sharply into March. In this example, then, it was less expensive to store grain. Although interest rates were high, the low corn price resulted in a relatively low interest charge on stored corn.

Because the cash price increased by 79 cents and the March futures increased by 41.5 cents, owning corn in any form from September 30 to February 24 was profitable. However, the cost of holding grain varied by as much as 19.23 cents per bushel, depending on the form of ownership. Regardless of which direction prices had moved, a higher net price would have been received from storage than from the other alternatives because the basis improved by more than the cost of storage.

Example 2

Table 3 illustrates the weekly price and basis pattern for the 1983 corn crop. The period covered is February before harvest through May following harvest. The process of determining the least-cost method of owning corn from October 6, 1983, to March 1, 1984, follows the steps outlined in Example 1.

For the 1983 crop the following assumptions are made. Commercial storage was at a rate of 14 cents per bushel from October 6 to January 1, and at 2 cents per bushel per month after that date. Stored corn, commercial or on-farm, was dried to 14 percent with a 1.3 shrink factor and a drying cost of 2 cents per point of moisture removed. A 14 percent interest rate was used. For futures trading, an initial margin deposit of $1,000 and a commission fee of $65 per contract are assumed. Futures trading and basis contracts are evaluated on the basis of the March futures contract. For the basis contract, a 2-cent service charge is used, and it is assumed that 80 percent of the value of the corn was paid on October 6. In the case of delayed pricing, the service charge is assumed to have been zero because of the extremely strong basis at harvesttime.

The costs of the alternative methods are summarized in Table 4. In this example, storage was the most expensive way to hold grain. Replacing cash with futures was the least costly method of owning grain. The basis actually widened by 1.5 cents, resulting in a negative cost in that category. The March futures price did decline, adding to the cost of maintaining the futures account; however, the total cost was only about 2 cents per bushel. The basis contract was also an inexpensive method of holding grain.

It should be noted that holding corn in any form from October 6, 1983, to March 1, 1984, was not profitable for the producer. Both the cash and futures price declined. The net price, however, varied considerably, depending on the form of ownership. The producer who held corn in commercial storage had a net price of $2.744 per bushel (a selling price of $3.225 minus a storage cost of $0.481).

The producer who sold corn on October 6 and bought March futures had a net price of $3.209 per bushel (a selling price of $3.485 minus a loss on futures of $0.240 minus the commission fee and interest on the margin account of $0.0357).

Conclusion

Whether to retain ownership of grain beyond harvesttime or delay the pricing decision beyond the time of delivery is a speculative decision. There is a cost associated with retaining ownership of grain, and there is no guarantee that prices will increase enough to cover that cost. Prices may actually decline. However, once a producer decides to retain ownership, the least costly method should be used.

The cost of physical grain storage is easy to estimate. The total cost includes warehouse costs, interest on the value of the stored grain, the cost of extra drying, handling, and shrinkage, and the cost of maintaining quality. The cost of delayed pricing contracts is also easy to estimate and is known with a high degree of certainty when the decision is made. It includes the service charge and the interest on the value of the grain.

The cost of owning futures, either directly or indirectly through a basis contract, is more difficult to forecast. The direct cost of owning futures is the cost of maintaining a futures account. The direct cost of a basis contract is the interest on the unpaid portion of the cash price at the time of delivery. However, both of these methods have an indirect or opportunity cost. When ownership is transferred from the cash to the futures market, the producer will not benefit from an improvement in the basis. This opportunity cost must be forecast when the decision is made.

In general, producers will find that it is less expensive to store grain than to own futures or to use deferred pricing arrangements when the basis is unusually weak. When the basis is unusually strong, the cost of owning futures or of deferred pricing is less expensive than the cost of storage.

Table 3. South Central Illinois Corn Basis, 1983 Crop

Thursday date	Cash price[a]	Basis[b] Dec	Mar	Jul
1983				
Feb 3				
10				
17	259[2]	−34	−41[2]	
24	256[2]	−33	−42	
Mar 3	259	−30	−40	
10	260[2]	−28	−37[2]	
17	268[2]	−30	−38	
24	278	−29	−37	−48
31	273[2]	−29	−37[2]	−49[2]
Apr 7	276	−28	−36[2]	−48
14	277[2]	−25[2]	−34	−45
21	275[2]	−23[2]	−31	−43
28	275	−24	−32	−43
May 5	278[2]	−25	−33[2]	−45[2]
12	263[2]	−24[2]	−34	−47
19	266	−21[2]	−30[2]	−43[2]
26	262	−20	−28	−39
Jun 2	262[2]	−18[2]	−26	−39
9	260	−18[2]	−26	−38
16	259[2]	−16	−24	−36
23	269	−19	−26[2]	−37
30	259	−16	−24	−35
Jul 7	262	−17	−24	−34
14	271[2]	−18[2]	−26	−36
21	300[2]	−22	−32	−40
28	303[2]	−25	−35	−44
Aug 4	319	−24[2]	−32	−33
11	327	−29[2]	−36	−37
18	327[2]	−23	−31	−33
25	339	−23[2]	−33	−37
Sep 1	332	−22	−32	−35[2]
8	349[2]	−15	−23	−27
15	333	−15	−23[2]	−26[2]
22	343	−17	−25	−26
29	340[2]	−11[2]	−13	−11
Oct 6	348[2]	− 4	− 7[2]	− 6[2]
13	351	− 7	− 4	0
20	330	− 7[2]	− 9	− 8
27	336[2]	− 9	− 5	+ 2
Nov 3	336[2]	−14	−12[2]	− 8
10	346[2]	−13	−13	− 8
17	342[2]	− 9	− 8[2]	− 3
24	331	—[c]	—	—
Dec 1	332[2]	− 8	− 9[2]	− 6
8	325[2]	− 8	− 9	− 7
15	319[2]	− 6	− 9[2]	−13
22	338		− 3	− 2
29	—			
1984				
Jan 5	328		− 5	− 9
12	330		− 5	− 7
19	322		− 5	− 7
26	321		− 7	−11
Feb 2	322		− 9	−13[2]
9	317[2]		−10	−14[2]
16	310[2]		− 8	−14
23	315		− 9	−11
Mar 1	322[2]		− 9	−10
8	330[2]		−10	− 7[2]
15	341		− 8	− 5
22	345			− 4
29	343[2]			− 2[2]
Apr 5	350			− 4
12	344			− 6
19	348			− 8[2]
26	332[2]			− 9[2]
May 3	340[2]			− 6
10	339[2]			− 6
17	346			− 1
24	349			− 4
31	345			− 5[2]

[a] Source: Illinois Department of Agriculture.
[b] Cash price minus the appropriate futures price.
[c] No price reported.

Table 4. Cost of Owning Corn from October 6, 1983, to March 1, 1984

Cost item[a]	Method of ownership				
	Commercial storage	On-farm storage	Sell cash, buy futures	Basis contract	Delayed pricing contract
	cents per bushel				
Warehouse	18.00				
Interest	20.33	20.33		4.06	20.33
Extra drying and shrinkage...	9.80	9.80			
Extra handling and shrinkage...		4.00			
Quality maintenance		1.00			
Basis improvement			−1.50	−1.50	
Futures account...			3.57		
Service charge				2.00	0.00
TOTAL.....	48.13	35.13	2.07	4.56	20.33

[a] See text for explanation and calculation of cost.

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This fact sheet is a product of the North Central Ad Hoc Producer Marketing Committee, including the following members: Dean Baldwin (Ohio), Gerald Campbell (Wisconsin), Ken Egertson (Minnesota), John Ferris (Michigan), Darrel Good (Illinois), Glenn Grimes (Missouri), Hugh McDonald (North Dakota), Gene Murra (South Dakota), Mike Sands (Kansas), Marvin Skadberg (Iowa), Bill Uhrig (Indiana), Al Wellman (Nebraska), and Ken Bolen (Nebraska), administrative liaison. Partial funding support was provided by the Farm Foundation.

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