3-5-1986

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COOPERATIVE EXTENSION SERVICE

Economics Newsletter

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No. 233 March 5, 1986

Livestock Producers Should Not Ignore The Food Security Act of 1985

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Livestock producers should consider the potential to improve their livestock operation's cash flow by participating in the 1985 farm program. Even though a livestock producer may use all the farm's production in the livestock operation, the 1985 farm program may represent a method to improve cash flow. Because of the large divergence between market prices and government target prices, deficiency payments could be a major revenue source for livestock producers.

In this newsletter, a case study hog and grain farm is analyzed to determine whether participation in the 1985 program could potentially improve the cash flow of the farming operation. Three price and production scenarios are analyzed to illustrate whether participation in the government program is a correct decision under different price and production conditions. The final section in the newsletter includes a discussion of how corn call options can be used to protect the livestock producer from increasing feed costs when a poor crop results in much higher grain prices.

Description of Hog & Grain Farm

It is assumed that the farmer buys feeder pigs during the year and uses the farm's corn and oats production to finish the hogs to a slaughter weight of 240 pounds. Nine bushels of corn and three bushels of oats are assumed to be required for the feeder pigs to reach market weight. The farmer plans to market 2,500 slaughter hogs during the year. This implies that the farmer must have 22,500 bushels of corn and 7,500 bushels of oats to finish the hogs. If the producer does not have sufficient production, it is assumed that grain must be purchased at a local elevator at a price 10 cents higher than the price being paid for farmer grain deliveries to the elevator.

The case study farm has 640 acres of which only 600 acres are tillable. The planned crop acreages are equal to the base crop acreages for the farm. For example, if the producer decides not to participate in the farm program, 300 acres of corn will be planted. This 300 acres of corn is exactly equal to the corn base for the farm.

The planned planting levels for the farm with and without government participation are presented in Table 1A. The required setaside including the paid diversion is 20 percent of the base acreage for corn and oats. If the producer participates in the farm program, only 240 acres of corn and 80 acres of oats will be planted or 80 percent of the base acreage. Because soybeans and alfalfa do not have a setaside requirement, the planted acreages are the same "with" and "without" the government program.

Table 1-A: Basic Information Required for Analysis of Hog Operation

	Corn	Oats	Soybeans	Alfalfa
	Base Acreage			
A. Without Program	300	100	150	50
B. With Program	240	80	150	50
	Projected Crop Yields Under Scenarios			
A. Bumper Yield	100	100	40	4
B. Base Yield	75	75	30	3
C. Poor Yield	50	50	20	2
	Projected Market Prices			
A. Bumper Yield	$1.60	$0.80	$4.50	$35.00
B. Base Yield	$1.85	$0.90	$4.75	$45.00
C. Poor Yield	$2.03	$1.60	$7.50	$65.00
	Projected South Dakota Support Prices			
A. All Yield Scenarios	$1.75	$0.69	$4.65	N.A.

For the analysis, the farm is assumed to be capable of producing a "bumper yield," a "base yield," and a "poor yield." The bumper yield is 33 percent higher than base yield and the poor yield is 33 percent lower than the base yield. To simplify the example, the base yield is assumed to be equal to the yield the ASCS will use to calculate the deficiency payments for the farm. With a bumper yield, the producer will have an actual yield higher than the yield used to calculate the deficiency payments. A poor yield is just the opposite.

Three Different Price Scenarios

It is assumed that all producers have yield experiences similar to the case study farm. Everyone has a bumper crop along with the case study farmer or everyone has a poor crop right along with the case study farmer. What does this imply about market prices for the grains and alfalfa produced?

Prices and production are inversely related. Higher production levels imply lower prices and vice versa. In the bumper yield scenario, the analysis assumes market prices will fall below the support price for corn, oats and soybeans. During the past year with its large crop, market prices have fallen below the support price. Expectations would be that another bumper would again cause prices to fall below the support price. If production is close to the base yields, the expectation would be for market prices to be slighly higher than the support prices. With a poor crop, the expectation would be for major price improvement.

The prices used in the analysis are presented on Table 1A. The actual support prices for South Dakota had not been announced at the time this analysis was conducted. The estimates in Table 1 represent our best "guess" based on the traditional price relationship between the South Dakota and national support prices. The market prices used in the case are directed more towards demonstrating what the case farm's cash flow will be at different price levels than to be forecasts of what prices will be next year.

The three price scenarios represent the three situations that the hog producer could be confronted with: (1) a situation where a large crop results in cheap feed at a price even lower than the loan rate; (2) a situation where an average crop results in feed costs not being much different from what currently exists; and (3) the final situation where the producer will be short feed and will have to buy grain at market prices.

The third scenario is the worst case scenario for the livestock producer because grain prices are assumed to run up to such a high level that no deficiency payment would be received. In fact, given the current government program, the producer would have to pay back the advanced deficiency payment that was received in the spring. In addition, the producer would have to buy high priced grain for feed in the cash market. It is assumed that the setaside acreage would produce no additional revenue to offset higher feed costs. If the producer does not participate in the program, this acreage would produce a crop which can be used in the feeding operation. This has been one of the reasons why many livestock producers have not participated in farm programs in the past. As will be demonstrated, the use of call options could offer the potential to at least partially offset this disadvantage for the livestock producer.

The slaughter hog and feeder pig prices were assumed not to change with changes in crop yields. This assumption was made so the analysis would show cash flow changes related only to the interaction between crop yields, crop prices and government program payments. The feeder pig price was assumed to be $34.25 and the slaughter hog price was $39.50.

Total Direct Costs of Production for Crops

The analysis concentrated only upon those costs directly related to the production of the crops and livestock. For grains, only those costs that changed either with the number of acres planted or number of bushels produced

were used to calculate total costs. Examples of such costs would be seed, fertilizer, fuel, machinery repair and interest costs on operating capital. These costs were obtained from the SDSU extension publication entitled Expected Production Costs for Major Crops in South Dakota. The cost figures for the East Central Area of South Dakota were used.

The direct costs for grain production DO NOT include overhead depreciation for machinery, return to management, rent on land or an interest charge on intermediate or long term assets. The decision to participate in the farm program is a SHORT-RUN decision for the farming operation. The decision must be based on the strategy that will produce the largest contribution to pay these overhead costs. This does not necessarily imply that a specific producer will be able to generate an adequate contribution to overhead to cover all costs associated with the farming operation.

Because participation in the farm program reduces the number of acres in production, the total direct costs of production are reduced with participation in the government program (Table 1B). For example, total direct costs associated with a bumper yield are $50,005 for non participation and $43,794 for participation. Total direct costs for crops not requiring a setaside are not reduced by government participation.

Table 1-B: Total Direct Costs for Crop Production Without and With Program Under Three Yield Scenarios

		Corn	Oats	Soybeans	Hay	Total Costs
	TOTAL DIRECT COSTS WITHOUT PROGRAM					
A.	Bumper Yield	$31,344	$5,712	$10,690	$2,058	$50,005
B.	Base Yield	$30,519	$5,637	$10,785	$2,058	$48,999
C.	Short Crop	$29,694	$5,562	$10,680	$2,058	$47,994
	Average Direct Costs Per Bushel or Per Ton by Yield Scenario					
A.	Bumper Yield	$1.04	$0.37	$1.82	$10.29	
B.	Base Yield	$1.36	$0.75	$2.40	$13.72	
C.	Short Crop	$1.98	$1.11	$3.56	$20.58	
	TOTAL DIRECT COSTS WITH PROGRAM*					
A.	Bumper Yield	$25,975	$4,670	$10,690	$2,058	$43,793
B.	Base Yield	$25,215	$4,810	$10,785	$2,058	$42,968
C.	Short Crop	$24,455	$4,750	$10,680	$2,058	$42,143
	Average Direct Costs Per Bushel or Per Ton by Yield Scenario					
A.	Bumper Yield	$1.06	$0.59	$1.82	$10.29	
B.	Base Yield	$1.38	$0.76	$2.40	$13.72	
C.	Short Crop	$2.02	$1.19	$3.56	$20.58	

* Direct costs of idle acres to meet program requirements are assumed to be $15.00 per acre. If these costs are added into total direct costs of the remaining acres, the average direct costs increase to the indicated level.

Total direct costs are higher for a bumper yield than a poor yield with and without participation in the govenment program. Why? A bumper crop will require additional operating capital, and have higher total drying and storage costs. An important point to consider is that average (per bushel) direct costs change with the three yield scenarios.

Average Direct Costs for Crops

Although total direct costs are the highest for the bumper yield, average direct costs for crops are the LOWEST with a bumper yield. Input costs are spread over a larger number of bushels per acre.

A livestock producer might ask the following question, "What if I have a poor yield and the rest of the country has a bumper crop? Wouldn't I be better off if I didn't participate in the program so at least I would not have to buy the grain?" In a poor crop year, the producer would have average direct costs of $1.98 per bushel for corn and $1.11 per bushel for oats (Table 1B). Even if the producer paid 30 cents over the market prices expected with a bumper crop, ($1.60 + $.30 for corn and $.80 + $.30 for oats as shown in Table 1) this still would be a lower price than the average direct costs of production. Also, remember that these average direct costs do not include any depreciation or land rental charge so the advantage of buying grain rather than producing grain is even larger than indicated by the reported average direct costs.

Total Direct Costs of Slaughter Hogs

The total direct costs of producing hogs, excluding grain costs, were estimated to be $57.00 per head. These costs include protein supplement, death loss, utilities, marketing and miscellaneous operating costs. Again depreciation and interest on buildings and equipment, and return to management were excluded from the direct cost calculation so that final returns reflect contributions to pay these overhead costs. This estimate was based on the January 31, 1986 "Profit Projection Report" prepared by John Morrell & Company.

Feed costs are excluded at this point because the value of the grain used as feed will vary depending upon the crop scenario and whether producers participate in the farm program. The cost of feed is NOT what a producer can produce the grain for but rather the price at which the grain can be sold or purchased. In feeding the grain, the producer is making a decision not to market the grain directly. The value of the grain being used in hog production is the value of the grain if marketed, not its cost of production.

The hog and grain farmer is really operating two businesses. The losses in grain production should be explicitly recognized rather than hidden by making feed costs equal to the cost of producing the grain. The grain production business must sell grain to the hog production business at the best available price for the commodity. The next section presents an abbreviated version of the calculations required to determine whether participation in the farm program would increase the cash flow of the case study hog and grain farm.

Contribution to Overhead

Compared to nonparticipation, participation in the government program would provide greater contribution to overhead in the bumper and base yield scenarios, but less in the poor yield scenario (Table 2). For the bumper yield scenario the dollar advantage of the government program was $21,345. It was $18,737 for the base yield scenario. In the poor yield scenario the shortfall was $2,596 dollars for participating in the government program.

Table 2: Total Revenues, Total Direct Costs and Contribution to Overhead With and Without Government Participation for a Hog and Grain Farm Under Three Yield Scenarios

Description	Bumper Yield	Base Yield	Poor Yield
WITHOUT PROGRAM PARTICIPATION			
A. Potential Crop Revenues	$90,000	$76,500	$62,450
B. Minus Value of Crop Used as Feed	$42,000	$48,375	$53,450
C. Crop Revenues from Marketing Off Farm	$48,000	$28,125	$29,000
D. Plus Revenues from Slaughter Hog Sales	$237,000	$237,000	$237,000
E. Total Revenue to Total Operation	$285,000	$265,125	$266,000
F. Minus Direct Costs			
Crop Production Costs	$50,005	$49,000	$47,995
Hog Production Costs other than Feed	$142,490	$142,490	$142,490
Costs of Purchased Feed	$0	$0	$27,725
G. Contribution to Overhead	$92,505	$73,635	$47,790
WITH GOVERNMENT PARTICIPATION			
A. Potential Crop Revenues	$84,020	$66,825	$71,760
B. Minus Value of Crop Used as Feed	$46,050	$38,700	$42,760
C. Crop Revenues from Marketing Off Farm	$37,970	$28,125	$29,000
D. Plus Government Benefits	$25,164	$22,981	$2,643
D. Plus Revenues from Slaughter Hog Sales	$237,000	$237,000	$237,000
E. Total Revenue to Total Operation	$300,134	$288,106	$268,643
F. Minus Direct Costs			
Crop Production Costs	$43,794	$42,969	$42,144
Hog Production Costs other than Feed	$142,490	$142,490	$142,490
Costs of Purchased Feed	$0	$10,275	$38,815
G. Contribution to Overhead	$113,850	$92,372	$45,194
H. Farm Program Contribution to Overhead	$21,345	$18,737	($2,596)

Higher grain prices placed the livestock operation in a cost squeeze because the market value of the produced and purchased feed is increased. The problem IS NOT the short crop, but rather the price of the feed input. The issue is controlling the market value of the feed input--not managing the farming operation to insure that an adequate feed supply is available. Until this year producers have lacked the necessary marketing tool to manage this price problem. The Chicago Board of Trade corn call options, initiated in 1985, could be used to solve the above problem.

Buying a Call Option

A call option gives the purchaser the right to buy a specified futures contract at a predetermined price called a strike price. The purchase price of the call option is the option premium. The Chicago Board of Trade corn options are based on 5,000 bushels futures contract. The fundamental rule of input procurement is "buy cheap." If the strike price of the call option is lower

than the price in the futures market, the call option has economic value. The owner of the option can exercise the option and buy the futures contract at the strike price which is lower than the futures market price or offset the option contract and obtain its value by collecting its now higher premium. If the strike price is higher than the futures market price, the owner of the option will not exercise the option because the "cheapest" market for the futures contract is the futures market price. Therefore, the call option premium will be zero at expiration.

If futures market prices increase, call option premiums increase and vice versa. When a livestock producer buys a corn call option, he is establishing a ceiling price for his feed input. The call's strike price is the highest price that the owner of the call has to pay for a specific futures contract. By adjusting for the local basis, the producer indirectly establishes a ceiling price for the feed inputs. Increases in the call option premiums will at least partially offset price increases in the cash market.

Assume the case study farmer buys 3 Chicago Board of Trade $2.20 December 1986 call options to establish a ceiling price on the feed that would have to be purchased with a poor yield. The estimated deficit was 14,500 bushels of corn and oats. The 3 calls represent 15,000 bushels of corn. This implies the producer has established a ceiling price on more bushels than the projected shortfall, but only 500 bushels more.

To purchase the $2.20 December 1986 calls, the producer would currently have to pay an option premium (at 9 cents per bushel, that would be $450 per option) (Table 3). Assuming a $70 commission per contract, the total expense would be $1,560 for the three calls. Because the worst scenario for an option buyer is to have the option expire worthless, the maximum loss the producer can suffer is $1,560. The option buyer does not have to generate capital for margin calls.

If the projected local cash prices are adjusted for an expected basis, the December 1986 corn futures contract could be at the following levels for each yield scenario: bumper yield ($1.85), base yield ($2.15), and poor yield ($3.43). Because the strike price of $2.20 is higher than the futures market price in the bumper and base yield scenarios, the option would expire worthless. The producer would suffer a loss of $1560.

Because the strike price is lower than the futures contract price in the poor yield scenario, the call premium would equal the futures price ($3.43) minus the call strike price ($2.20) at expiration. Therefore, the producer could sell the call option for a premium equal to at least $1.23 per bushel or $6,150 per contract. To sell the option the producer would have to pay additional commissions of $70 per contract so revenues after commissions would be $18,240.

The contribution to overhead with a poor crop and high prices assuming program participation and the purchase of three call contracts, would increase to $61,874. That would be a major improvement in the distribution of returns under the three scenarios from the perspective of risk management. Although the producer experiences lower returns within the bumper and base yield scenarios, the livestock producer receives a major boost in cash flow during a cost-price squeeze in the livestock operation. If December futures market prices stay the same or fall during the next couple of months before the spring and summer weather markets, this type of feed price insurance may be very reasonably priced.

Table 3: Contribution to Overhead if a Chicago Board of Trade December 1986 $2.20 Calls Are Purchased to Protect Producer From Price Increases During a Poor Crop Year

Description	Bumper Yield	Base Yield	Poor Yield
	WITH PROGRAM PARTICIPATION		
A. Number of Dec. $2.20 Calls Bought	3	3	3
B. Contribution to Overhead	$113,650	$92,372	$45,194
C. Minus Option Expense (3 * 5,000 bu.* $.09/bu. * $210)	$1,560	$1,560	$1,560
D. Plus Revenues from Sale of Options*	$0	$0	$18,240
E. Contribution to Overhead with Options	$112,290	$90,812	$61,874

*The options in the bumper and base yield scenarios would expire worthless. With a poor crop with higher prices the option would be worth $1.23 per bushel or $6,150 per contract. A $70 commission per contract would have to be paid to sell the contract. In the other two scenarios, the option would simply let to expire and therefore has no commission cost. Lower commission levels could probably be obtained from a discount broker.

Conclusion

The completed analysis clearly demonstrates that livestock producers or

their lenders should not simply ignore the farm program. In evaluating participation in the farm program, each producer must go through a detailed analysis of their own operation. They should attempt to do a scenario analysis as conducted here to gain a perspective of their returns under different yields and prices. Since this decision may represent a multi-thousand dollar decision, producers would be well advised to invest money in finding out what would be the best alternative for their operation.

Traditional management strategies must be evaluated with the facts rather than perceptions. Producers must evaluate whether the new marketing strategies, such as call options, can be incorporated into their risk management program. Hopefully, this article will stimulate interest in evaluating carefully the strategies available.

Issued in furtherance of Cooperative Extension work, Acts of May 8 and June 30, 1914, in cooperation with the USDA. Richard A. Battaglia, Director of CES, SDSU, Brookings. Educational programs and materials offered without regard to age, race, color, religion, sex, handicap, or national origin. An Equal Opportunity Employer

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