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LENDERS' PERCEPTION OF BORROWER
PARTICIPATION IN CROP INSURANCE PROGRAMS

by

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LENDERS' PERCEPTION OF BORROWER
PARTICIPATION IN CROP INSURANCE PROGRAMS

The Federal Crop Insurance Act of 1980 marked the end of eight years of efforts to design a program whereby agricultural producers would have available cost effective protection from natural disasters. The Act of 1980 contained provisions to make crop insurance the most attractive form of disaster protection for the producers protected, the private industry insurance marketers, and the taxpayers financing agricultural disaster programs. Recent legislation requires that agricultural producers must purchase Federal Crop Insurance, if available in their area and for their crop, in order to be eligible for low-interest disaster loans.

In retrospect, the Federal Crop Insurance has not been as widely accepted by producers as had been hoped. Currently, a low percentage of qualified acreage is covered by the crop insurance program, loss ratios (indemnities to premiums) are higher than desired (as high as 150%), the crop insurance product itself is complex, and a large number of producers remain uninformed about recent improvements in the program. Efforts are being made by the Federal Crop Insurance Corporation, private industry, and State University personnel to address these concerns.

Of concern to these groups, and directly influencing the above issues, is a proposal to remove the level of government subsidy currently in the crop insurance program. This action, according to Classen and Gibson, would raise the national average premium cost per acre from \$4.68 in 1986 to \$19.83 in the future. Such a price increase is hypothesized to decrease the cost effectiveness of the crop insurance program for producers and lower participation rates.

Several research studies have been completed, and many are in progress, exploring provisions of the crop insurance program and its cost effectiveness as a risk reducing mechanism for agricultural producers. Black set forth two possible explanations of low participation rates in the crop insurance program. First, that producers were unaware of, or did not comprehend the benefits of, the Federal Crop Insurance program or any of the recent "improvements". Second, producers perceived that the cost of the program (premiums paid) to be greater than the perceived benefits (indemnities and protection received).

Pflueger and Barry recognized that earlier studies implicitly assumed independence between the producer's decision to participate in the crop insurance program and the financial organization of his business. They recognized that lender perception of the use of risk reducing strategies could affect a producer's financing costs and thereby influence the decision for participation in crop insurance program. Pflueger and Barry found that a borrower participating in a crop insurance program had the potential of greater credit availability and thereby improve farm survival and liquidity.

Leatham, Richardson, and McCarl examined the lender welfare issue of borrower participation in a crop insurance program. They recognized that crop insurance can potentially reduce lenders' risk by reducing the probability of delinquent and defaulted loans while at the same time depleting a firm's liquidity and income. From a lender's viewpoint, the decision to finance the operation is contingent on whether crop insurance will reduce credit risk. These authors conclude that at insurance loss ratios (ratio of expected indemnity payments to expected cost) of less than .58, the probability of firm survival was 100 percent and the lender was indifferent to the use/nonuse of crop insurance. At loss ratios of greater than .58, both lender and producer preferred the use of crop insurance. Leatham, Richardson, and McCarl conclude that at a loss ratio of lender which the lender could resolve by adding a small premium charge to nonusers of crop insurance thereby encouraging the use of crop insurance.

Pflueger and Barry surveyed lenders' credit response to a borrower's use of crop insurance and Leatham, Richardson, and McCarl examined the lenders' risk exposure by a borrower's use of crop insurance. However, actual data on lender/borrower interaction towards the use of crop insurance was still missing. Skees has stated that, "More research of the nature conducted by Pflueger and Barry is needed." This study was conducted to provide additional information in this area of lender/borrower interactions and responds to the informational needs suggested.

Objectives

The objective of this study was to provide insight to a crop insurance marketing question not previously studied - the viewpoint of lenders financing the premiums for Federal Crop Insurance. The viewpoint of lenders as to the extent of which their producers were participating in a crop insurance program could indicate the current and projected levels of participation, the extent to which lenders regard crop insurance programs as cost effective risk reducing strategies, and reasons for low participation. Thus, a survey of lenders was conducted to address the question of lenders' reaction to borrower participation in crop insurance programs.

The objectives of the survey were as follows:

1. To determine how the removal or reduction of the government subsidy might affect participation in crop insurance programs.
2. To determine lenders' perceptions as to why, and which, borrowers may not be purchasing crop insurance.

3. To compare lenders' perception of the level of participation of their borrowers in the multiple peril crop insurance program with participation in private hail/fire insurance.

Data Collection

A survey was mailed during January 1987 to the senior agricultural lending officer at major agricultural lending institutions within South Dakota. Lenders comprising the sample were affiliated with Farmers Home Administration (FmHA), Farm Credit Services (FCS), and commercial banks. A follow-up letter and survey were mailed three weeks after the initial survey was sent. In total, 191 surveys were returned for a response rate of 56%. Although a survey of producers could have provided additional insight into this question, many producers were experiencing financial difficulties and their responses as to why lenders did/did not require crop insurance or finance their operation in the absence/presence of crop insurance may have been biased. Also, as Black has stated, many producers may not be familiar with the crop insurance program.

South Dakota was an excellent place to conduct such a study due to the diversity of lender types and the level of participation in crop insurance programs. Banking laws within South Dakota allow for diversity within the organizational structure of the banking community: multi bank holding company, affiliate branch banking, and independent banks. (Schmiesing, et. al). Also, there is a number of multi peril crop insurance policies sold every year in South Dakota; 1.6 million acres of crop land insured for \$109 million of protection in 1986. In addition, the Cooperative Extension Service, South Dakota State University, has released several extension bulletins, lenders are included on the mailing list, concerning new provisions and recent improvements in the crop insurance program.

Crop insurance is available to producers either as the multi peril crop insurance, commonly referred to as Federal Crop Insurance (Federal Crop Insurance can be offered as either multi peril insurance or limited peril insurance (hail/fire), but is most often associated with the multi peril insurance) or as private hail/fire insurance. A distinction between the two was made in the survey with the multi peril insurance being referred to as Federal Multi Peril Crop Insurance and the limited peril insurance referred to as private hail/fire insurance.

Survey Results

In the survey, lenders were asked what percent of their borrowers, disregarding borrower risk class, currently purchased some form of crop insurance. Lenders were also asked what

percent of their borrowers were likely to purchase some form of crop insurance in the advent that the governmental subsidy was removed from the Federal Crop Insurance program; the possibility was detailed in the question and a fifty percent increase in premium rates was assumed. Lenders were solicited for their opinion as to why producers may not participate in the Federal Crop Insurance program.

An additional component of the survey requested that lenders categorize their responses by risk class of their borrowers. It was assumed that lenders would have no problems classifying their borrowers as the last two annual survey of lenders conducted by the Economics Department, South Dakota State University, had used the same classifications of borrower risk classes. This delineation of responses is necessary to determine which class of borrowers are purchasing, or are being encouraged to purchase, crop insurance. A concern of the Federal Crop Insurance Corporation is that of adverse selection; only high risk, low management ability producers participating in the crop insurance program.

Table 1. shows the number of survey respondents as well as the number of survey respondents who provided useable responses to the crop insurance questionnaire classified by type of lender. Table 1. shows that commercial banks were a predominant proportion of the survey sample. The percent of useable responses from each class of lender was very strong.

Table 1. Survey Respondents by Lender Classification

Lender Class	# of Survey Respondents	# of Useable Respondents
Commercial Banks (Banks)	147	143
Farm Credit System (FCS)	13	12
Farmers Home Administration (FmHA)	31	31
Total Respondents (All)	191	186

Table 2. gives the percent of borrowers purchasing the various types of crop insurance available given the current rates for multi peril crop insurance and then assuming a fifty percent increase in the premium rates for multi peril crop insurance. The numeric values in Table 2. are the mean responses of the lenders from the various classifications. Lenders, as shown by Table 2., indicated that almost twice the percentage of borrowers would select private hail/fire insurance as compared to multi peril insurance. For every class of lender, the percent of borrowers not purchasing some form of crop insurance was greater

than any other category. Purchasing private hail/fire insurance was the second most popular selection, and every lender class indicated that at least a proportion of their borrowers would purchase both multi peril and private hail/fire insurance.

T-Tests were used to determine the statistical significance of the difference in the lenders' response as to what percent of their borrowers would purchase the various types of crop insurance. T-Tests were used for this analysis since for each type of insurance, the independent variable was double bounded; the lower bound in each response was zero and the upper bound was 100 percent. More statistically advance algorithms for analyzing the data were not available. Alpha levels of 0.05 and 0.1 were chosen on which to determine the confidence interval.

Table 2. shows that there exists a statistically significant difference in the mean response of lenders regarding the percent of their borrowers who would purchase some form of crop insurance. Generally no statistically significant differences existed in the mean responses of lenders regarding the purchase of private hail/fire insurance nor the percent of borrowers who would not purchase any form of crop insurance. The inability to show a statistically significant difference is shown in the table by no asterisks in the difference column.

Thus, from Table 2., it can be concluded that, in the viewpoint of the agricultural lenders, that the decision to participate in the multi peril crop insurance program is price sensitive. When the cost (premiums) of the multi peril crop insurance is increased, there is a shift away from multi peril crop insurance towards private hail/fire insurance. This confirms expectations and is consistent with economic theory.

Within the survey, lenders were asked to respond to possible reasons why borrowers would not be participating in some form of crop insurance program and especially in the multi peril crop insurance program. Lenders were asked to rank by order of importance the following reasons for producers not purchasing crop insurance: (1) producers knowledge of crop insurance programs; (2) producers need to cut cash outlays regardless of risk; (3) costs (premiums) of crop insurance programs exceeding the benefits (indemnities); and (4) other reasons that lenders could list. By consensus, lenders indicated that the primary reason producers did not purchase crop insurance was that costs exceeded the benefits.

Another portion of the survey asked lenders to respond to whether their institution sold some form of crop insurance. The percentage of each lender classification that did sell some form of crop insurance is given in Table 3. The presence of the lenders' institution in the crop insurance market could have an influence on the percent of their borrowers who did purchase some form of crop insurance. It was assumed that lenders who sold crop insurance would be more knowledgeable about the product and would relate the benefits of crop insurance to their borrowers.

Table 2. Percent of Borrowers Purchasing Crop Insurance
Classified by Type of Insurance and Lender

Lender Type	Insurance Type	Current MPCl Rates	50% Higher MPCl Rates	Difference
FCS	MPCI	8.50	1.73	7.55 **
	Hail/Fire	30.75	26.54	3.36
	Both	3.75	.91	3.18 **
	Neither	57.00	70.82	-14.09 *
FmHA	MPCI	13.07	6.36	6.48 **
	Hail/Fire	33.33	39.36	-5.63
	Both	12.04	12.32	-0.74
	Neither	41.56	41.96	-0.11
Banks	MPCI	13.46	7.11	6.00 **
	Hail/Fire	25.50	35.13	-8.73 **
	Both	8.69	5.86	3.03 **
	Neither	52.35	51.90	-0.21
All	MPCI	13.03	6.60	6.19 **
	Hail/Fire	27.25	35.27	-7.34 **
	Both	8.82	6.67	2.39 *
	Neither	50.90	51.46	-1.17

** = Statistically Significant at alpha = .05

* = Statistically Significant at alpha = .10

Table 3. Percent of Respondents Indicating Presence in Crop Insurance
Sales by Lender and Insurance Type

Lender Type	% Selling MPCl	% Selling Hail/Fire
Banks	55.24	73.43
FCS	100.00	100.00
FmHA	0.00	0.00
All	48.92	63.98

Lenders were asked to respond to questions concerning the percentage of their borrowers that they encouraged to purchase some form of crop insurance. Lenders responded to questions concerning encouragement of the purchase of either multi peril crop insurance or hail/fire insurance. No questions were asked regarding encouragement of both types of insurance.

Tables 4.-7. give the percentage of borrowers that lenders encouraged to purchase some type of crop insurance. As Table 3. indicated that all Farm Credit Services lenders sold both types of insurance, and that Farmers Home Administration lenders do not sell any insurance, no deliniation of selling insurance among these groups is given in Tables 4. and 5. Tables 6. and 7. subdivide the responses of lenders from commercial banks and all lenders into the categories of selling various types of insurance.

Table 6., and consequently Table 7., presents an interesting finding regarding lenders encouragement of borrowers to purchase crop insurance and whether they sell insurance. Lenders affiliated with commercial banks that sell multi peril crop insurance are less likely to encourage borrowers of superior and good risk classifications to purchase multi peril crop insurance than lenders that do not sell multi peril crop insurance. For borrowers in less favorable risk classifications, lenders that do sell multi peril crop insurance are more likely to encourage their borrowers to purchase multi peril crop insurance than those that do not sell multi peril crop insurance. Lenders that sell hail/fire insurance displayed opposite tendancies.

Lenders affiliated with commercial banks that sell multi peril crop insurance are more likely to encourage the good, weak and inferior risk class borrowers to purchase hail/fire insurance than those that do not sell multi peril crop insurance. For those lenders of this class that sell hail/fire insurance, they encourage fewer of their borrowers in all but the superior risk class to purchase hail/fire insurance. In every case, disregarding whether lenders sell insurance or not, a greater percentage of the higher risk class of borrowers are encouraged to purchase some form of crop insurance protection.

Implications and Conclusions

The indications of the survey results are clear and merit consideration by those associated with the crop insurance industry of crop insurance research. The findings of this research meet the objectives of the study and indicate three distinct considerations for crop insurance research now and into the future. Future research needs and implications of this research for other firm level research will be presented at the end of this section.

The three major findings of this research are, first, that the survey results indicate that lenders believe borrowers are more apt to purchase hail/fire insurance rather than multi peril insurance. This finding must be weighed against the fact that, according to the American Association of Crop Insurers, the primary cause of crop yield loss in south Dakota is from drought (49.8%). Thus education efforts may be better directed to helping producers identify the causes of their yield loss, and strategies or tools that producers can use to manage those causes.

Additionally, this finding implies that a look at restructuring the multi peril crop insurance program may be in order. A multi peril insurance program that parallels the coverages and costs of existing hail/fire insurance with extended coverage against other natural disasters available at additional cost may be more attractive to producers. Such a program would strongly impact the actuarial structure of the Federal Crop Insurance program. Hail/fire coverage would need be issued at competitive coverages and costs to producers and then the cost of additional coverage would need be differentiated by the cause of loss insured against and the characteristics of the borrower and/or his operation. Steps have already been taken along this path with the aspect of Actual Production History (APH) provisions of the current crop insurance program.

The second major finding of this study is that, in the view of the lenders surveyed, borrowers are sensitive to the cost of multi peril crop insurance. Should the governmental subsidization be removed from the Federal Crop Insurance program and thereby raise the cost of insurance to producers, lenders feel that statistically significantly fewer borrowers will purchase multi peril crop insurance with more borrowers purchasing hail/fire insurance. Thus, for a program that is already concerned with low participation rates, the presence and level of government subsidization is crucial.

The third major finding of this study is that lenders seem to feel that crop insurance is not a viable alternative for producers who are in a strong financial position. Perceptions of program costs exceeding benefits seem to be a factor as lenders are only encouraging producers in weaker financial positions to purchase crop insurance. The direction and level of lender encouragement of their borrowers to purchase crop insurance can be related to the work of Pflueger and Barry in which lenders were shown to extend more credit to borrowers in weak financial positions thereby reaffirming that for some borrowers, crop insurance may be a more viable risk management strategy than that of self insuring against yield loss.

While this study has taken steps to fill a void in the research pertaining to crop insurance programs, it has perhaps in a greater sense pointed to a need for further research along these lines. Previous research has shown the need to include the financing aspect of a producers crop insurance purchasing

decision. This study supports findings of other research by showing that while lenders may be more willing to finance the premiums of a crop insurance policy, their willingness may be directed to those borrowers who can not afford to self insure against crop yield loss. Therefore, more research need be done to determine which risk management strategies borrowers in strong financial position are most likely to adopt.

Another area of further research is the aspect of borrower risk classess. Lenders are differentiating between their borrowers; a borrower is not just a borrower. As lenders distinguish between risk classes of borrowers, research concerning these same producers ought to also distinguish between them. Such distinction will become more necessary as lenders use these risk classes not only for loan classifications but also for loan pricing.

Additionally, further research could be done on the commercial bank aspect presented in this study. If the sample of commercial bank lenders could be further subsampled into the various affiliations of the banking orgaizational structure, further insight into how lenders from different institutions would be gained. Also, the aspect of moral hazard needs to be examined more closely in light of these research findings. Are participants in crop insurance programs in just poor financial position, or are they also poor managers? The need for research in the area of producer risk management strategies continues to exist and crop insurance research remains an integral portion of the risk research area.

Table 4. Percent of FmHA Lenders Encouraging Borrowers to Purchase Crop Insurance by Type of Insurance and Borrower Classifications

Borrower Classification	% Encouraging MPCl	% Encouraging Hail/Fire
Superior	64.52	54.84
Good	64.52	58.06
Average	77.42	70.97
Weak	77.42	74.19
Inferior	77.42	70.97

Table 5. Percent of FCS Lenders Encouraging Borrowers to Purchase Crop Insurance by Type of Insurance and Borrower Classifications

Borrower Classification	% Encouraging MPCl	% Encouraging Hail/Fire
Superior	0.00	0.00
Good	0.00	0.00
Average	15.38	23.08
Weak	61.54	84.62
Inferior	69.23	84.62

Table 6. Percent of Commercial Bank Lenders Encouraging Borrowers to Purchase Crop Insurance by Type of Insurance and Borrower and Lender Classification

Borrower Classification	Multi Peril Insurance		Hail/Fire Insurance	
	Do Sell	Do Not Sell	Do Sell	Do Not Sell
Percent of Lenders Encouraging Borrowers to Purchase MPCI				
Superior	3.80	6.25	2.86	0.00
Good	13.92	14.06	10.48	0.00
Average	37.98	31.25	30.47	100.00
Weak	59.49	42.19	47.62	100.00
Inferior	60.76	43.75	50.48	100.00
Percent of Lenders Encouraging Borrowers to Purchase Hail/Fire				
Superior	7.59	10.94	8.57	0.00
Good	16.46	14.06	15.24	100.00
Average	41.77	42.19	40.00	100.00
Weak	63.29	54.69	58.10	100.00
Inferior	64.56	53.13	60.00	100.00

Table 7. Percent of All Lenders Encouraging Borrowers to Purchase Crop Insurance by Type of Insurance and Borrower and Lender Classification

Borrower Classification	Multi Peril Insurance		Hail/Fire Insurance	
	Do Sell	Do Not Sell	Do Sell	Do Not Sell
Percent of Lenders Encouraging Borrowers to Purchase MPCl				
Superior	3.30	24.21	3.36	32.84
Good	12.09	29.47	10.08	40.30
Average	35.17	45.26	29.41	59.70
Weak	60.44	52.63	49.58	68.66
Inferior	62.44	53.68	52.94	67.16
Percent of Lenders Encouraging Borrowers to Purchase Hail/Fire				
Superior	6.59	25.26	8.40	29.85
Good	14.29	28.42	14.29	34.33
Average	39.65	51.58	38.66	58.21
Weak	67.03	61.05	61.34	68.66
Inferior	68.13	58.95	62.18	65.67