Changes in agricultural policy have altered the risk environment for agricultural producers and increased the need for greater understanding of producers' risk management. The 1996 "Freedom to Farm" legislation shifted much of the responsibility for risk bearing to individual producers. Later legislation significantly reformed crop insurance and increased the premium subsidies in an effort to limit *ad hoc* disaster assistance programs. Low commodity prices, beginning in 1998, raised concern about the "safety net" for

What Influences Producers' Risk Management and Marketing Decisions

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agriculture and resulted in market loss assistance payments. Most recently, the 2002 Farm Bill strengthened the safety net by introducing counter-cyclical payments for producers. During the same period, the Risk Management Agency (RMA) has funded a number of risk management-oriented projects. One of these projects, "Understanding Farmer Risk Management Decision Making and Educational Needs," was designed to provide a baseline for risk management education efforts.

This article provides a summary of some of the initial results of that four-state study of stratified, random samples of crop and livestock producers. Mail surveys were conducted and responses were obtained from 1,812 crop producers in Indiana, Mississippi, Nebraska and Texas in the spring of 1999. In the spring of 2000, 630 hog producers in Indiana and Nebraska were surveyed. The study also involved surveys of beef producers in Nebraska and Texas, limited resource farmers in Mississippi, and county Extension personnel in all four states. Results from these surveys are not included in this article.

The project identified the risk manage-

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ment objectives of regionally diverse producers, investigated producers' perceptions and understanding of risk management tools, and examined what factors influence producers' risk management strategies. More detailed information is available at: **www.agecon.msstate.edu/riskedu**.

Sources of Risk

Producers were asked to rate sources of risk in terms of their potential to affect farm income on a scale of 1 (low) to 5 (high). Not surprisingly, crop producers (Figure 1) assigned the highest importance to price variability (4.55) and yield variability (4.07). Changes in input costs (3.80), changes in government commodity programs (3.64) and changes in government regulations (3.58) were rated lower in importance. Hog producers (Figure 2) also considered price variability (4.28) as having the greatest potential to affect farm income. Diseases in hogs (3.90), market access (3.71) and input costs (3.66) were rated somewhat lower. Lenders' attitudes (2.77) were considered to have the least effect on farm income of the factors considered. Thus, there is almost uniform concern among producers about price and factors affecting output as the major factors impacting their incomes.

Figure 1. Assessment of Risks Confronting Crop Producers

Farm Commodity Programs	3.64
Government Regulations	3.58
Yield Variability	4.07
Price Variability	4.55
Input Costs	3.80
Land Rents	3.52

Figure 2. Assessment of Risks Confronting Hog Producers

Environmental Regulations	2.81
Diseases in Hogs	3.90
Hog Price Variability	4.28
Input Costs	3.66
Market Access	3.71
Lenders' Attitudes	2.77

Figure 3. Effectiveness of Risk Management Strategies - Crops

Enterprise Diversification	3.27
Be a Low-cost Producer	3.64
Forward Pricing	3.12
Crop Insurance	2.93
Off-farm Employment	2.87
Maintain Financial Reserve	3.58

Responses to Risk

Producers also were asked to rate the effectiveness of various risk management strategies. Crop producers (Figure 3) rated being a low-cost producer (3.64) and maintaining a financial or credit reserve (3.58) as being most effective. Forward pricing (3.12), crop insurance (2.93), and off-farm employment (2.87) were rated much lower in terms of effectiveness. Maintaining good herd health (4.26), being a low-cost producer (4.17) and maintaining reserves (3.62) were the most highly rated responses for hog producers (Figure 4), while production contracts were rated at only 2.54. Again, off-farm employment (2.64) was not rated highly as a risk management strategy.

Overall, the results generally support our view of agricultural producers as being most concerned about price and factors affecting yields. Producers try to be low-cost producers, avoid health problems with their livestock and maintain appropriate reserves. Some of the commonly suggested risk management strategies such as forward pricing, crop insurance and contracting are not considered especially effective by producers. Off-farm employment also was rated relatively low in terms of effectiveness in risk management. However, the question did not clarify whether the off-farm employment was of the producer or the spouse, and the cash-flow effects of off-farm employment were not considered.

Risk Management Education Activities

Figure 4. Effectiveness of Risk Management Strategies - Hogs

Diversification	3.51
Contracting Inputs	3.05
Production Contracts	2.54
Maintain Financial Reserve	3.62
Maintain Herd Health	4.26
Be a Low-cost Producer	4.17
Off-farm Employment	2.64

Nearly 75 percent of the crop producers surveyed had participated in risk management educational programs during the three years preceding the survey. Marketing programs were the most common, followed by crop insurance and financial management programs. Small producers, those with less than $100,000 gross farm income, participated less in educational programs and also considered themselves less knowledgeable in the use of crop risk management tools than did larger producers. Producers who participated in marketing educational activities averaged about 12 hours of training during the last three years. Participants in financial management activities also averaged about 12 hours in these activities. In contrast, participants had only about six hours of training on insurance-related programs. Less than half of the risk management training was provided by Extension personnel.

Participation in risk management educational activities was less common among hog producers than crop producers. Only about 45 percent of hog producers with less than 1,000 head had participated, compared with nearly 70 percent of producers with more than 5,000 head. Given the extremely low hog prices of late 1998, it is not surprising that alternative pricing mechanisms (marketing contracts, futures and options) were the most commonly attended type of program, followed by financial management. Larger producers considered themselves more knowledgeable than smaller producers in the use of all hog risk management tools.

As with crop producers, those hog producers who did participate in educational activities spent an average of about 12 hours during three years in programs related to alternative pricing mechanisms and 14 hours in programs related to financial management. Only about one-third of the risk management training for hog producers had been provided by Extension personnel.

Factors Affecting Interest in Additional Risk Management Education

Seventy-one percent of crop producers indicated strong interest in learning more about at least one of the risk management tools of forward contracting, futures and options, crop yield insurance, crop revenue insurance or financial management. A probit model was used to determine those factors that affected an individual's interest in additional risk management education. Not surprisingly, prior use of a risk management tool had a very strong effect on a producer wanting to learn more about it.

Older farmers and those with less formal education were less likely to be interested in learning more about a risk management tool, while size of the farm had little effect. More specialized producers, those more concerned about risk and those with a greater percentage of borrowed capital were more likely to be interested in learning about the risk management tools. Finally, a lender's encouragement of the use of forward pricing or crop insurance had a strongly positive effect on the producer's interest in learning about risk management tools.

Risk/Return Behavior of Producers

Higher returns are generally associated with greater risk, and recognition of this risk/return trade-off is fundamental in risk management. However, 33.6 percent of cotton producers and 36.8 percent of corn producers were unwilling to give up **any** of their current yield to avoid year-to-year variability in yield, suggesting they would be unwilling to pay for crop insurance. In the marketing area, 34.3 percent of crop producers and 61.4 percent of hog producers disagreed with the statement: "I'm willing to accept a lower market price to reduce price risk."

Only 32.7 percent of hog producers and 44 percent of crop producers agreed that "My primary marketing goal is to reduce risks rather than to increase my net sales price."

Marketing Behavior of Producers

About 27.8 percent and 31.9 percent of soybean and corn producers, respectively, did no forward pricing of these crops in the period 1995-98. Marketing behavior does not appear to change much even with different market situations, with producers following similar strategies each year. A two-step analysis of pricing found that larger scale farms were more likely to forward price than were smaller farms, perhaps because of the fixed costs involved. Comfort in using futures and options and the lender's encouragement of forward pricing affected the percentage of both soybeans and corn priced before harvest.

Implications

Results suggest that many producers' perceptions of risk management do not reflect the risk/reward trade-off, and educational programs will need to help producers understand the fundamentals of risk management. However, programs on costs of risk management and reducing price risk in marketing, especially if farmers think that they can "beat the market," are not likely to be popular with producers.

Large-scale producers have a greater interest in risk management information and are more knowledgeable in using risk management tools. Prior use of a risk management tool has a large impact on interest in obtaining additional training. This suggests that it is likely to be difficult to interest many producers in risk management education. Lenders can play a significant role in this process by encouraging their borrowers to consider crop/revenue insurance, alternative pricing techniques and other risk management tools. **jal**