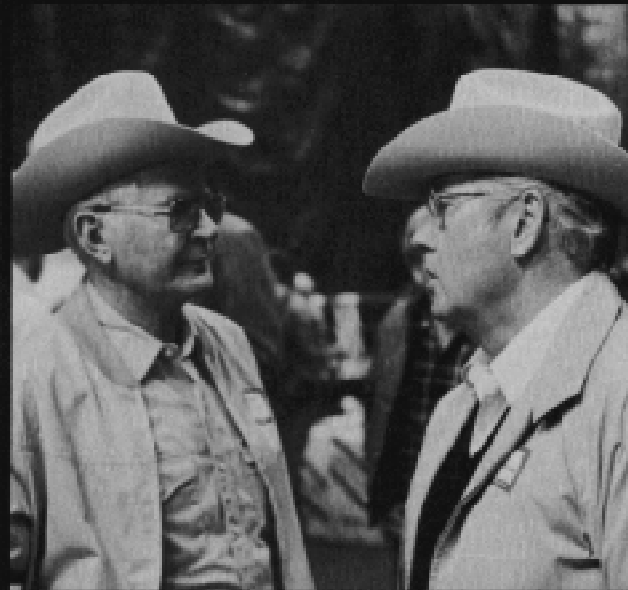


Marketing Practices and Seminar Participation of Kansas Agricultural Producers



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MARKETING PRACTICES AND SEMINAR PARTICIPATION OF KANSAS AGRICULTURAL PRODUCERS¹

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SUMMARY

- ◆ Approximately one-half of Kansas agricultural producers surveyed used forward pricing for at least some of their sales in 1990-92.
- ◆ Cash marketing tended to dominate pricing, with 98% of producers selling at least some of their production in the cash market.
- ◆ In 1990-92 relative to 10 years earlier, the percentage of Kansas agricultural producers using forward contracting more than doubled, the percentage using hedging increased more than 50%, and options use became common with 19% of producers adopting options by 1992.
- ◆ Producers who used forward pricing (forward contracting, hedging, or options) typically marketed a large percentage (25% to 45%) of their production using these methods.
- ◆ Corn had the highest percentage of total production forward priced (33%), followed by wheat (24%).
- ◆ Forward pricing was more likely to be adopted by less experienced (younger), crop producers with greater acreage, with high leverage and high input intensity, who had attended a marketing/risk management seminar.
- ◆ Forward pricing was used to market a larger percentage of production by less experienced, more educated, crop producers, with high leverage and high input intensity, who had attended a marketing/risk management seminar.
- ◆ Two-thirds of producers had attended a marketing/risk management seminar organized by a public or private association.
- ◆ Attendance at marketing/risk management seminars was more likely among less experienced, more educated, well-read producers with larger and higher leveraged farms having a large percentage of land in crop production and located nearer towns.

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INTRODUCTION

Price risk is pervasive in agricultural markets because of inelastic demand and supply, production rigidities and adjustment lags, weather uncertainty, and the influence of macroeconomic policies and global demand on agricultural markets. Price risk in agricultural markets has been considerably higher than price risk in industrial markets since the 1970s (Han et al.). Price variability is an important component of overall profit variability. Patrick et al. reported that livestock producers ranked livestock price variance as their most important source of profit variability. Similarly, crop producers generally ranked price variability as either their first or second (behind weather) most important source of risk. A recent survey of lenders in Kansas revealed that they ranked commodity sale prices, yield variability, and commodity purchase prices as the three most important sources of producer cash flow variance (Mintert).

In light of these issues, price risk management is of considerable importance to agricultural producers. In addition, agricultural lenders have indicated preferences for lending to producers who secure price protection (Harris and Baker). Numerous forms of price risk management exist for agricultural producers. Futures hedges, forward contracts, option hedges, and output diversification are a few risk strategies that producers can pursue. Several studies have established that the use of futures, forward contracts, and options markets can significantly reduce producer price risk relative to cash marketing (Berck; Curtis et al.; Elam and Vaught; Holland et al.; Miller and Kahl; Spahr and Sawaya; Schroeder and Hayenga; and Zacharias et al.).

Despite extensive price risk and the abundance of research suggesting marketing techniques to manage price risk, relatively few producers use forward contracts and futures markets. In surveys of Kansas grain producers, Hill found that in 1972 only 4% had ever hedged and 12% had ever forward contracted. Asplund et al., in a survey of 353 Ohio farms, found that 42% forward contracted and 7% hedged some of their crop in 1986. In an effort to educate agricultural producers as to the availability and application of risk management techniques, public and private interests have established a variety of educational programs. Public programs include resources directed toward extension-based educational efforts. Private sector educational efforts include programs sponsored by producer associations (e.g., Farm Bureau) and commodity exchanges (e.g., the Chicago Mercantile Exchange and the Chicago Board of Trade).

The purpose of this paper is to report results of a survey of marketing methods of Kansas agricultural producers. In addition, we determined factors affecting farmers' adoption of forward and futures marketing methods and examined factors influencing producer attendance at risk management seminars. Survey data collected from 539 Kansas crop and livestock producers were matched to detailed Kansas Farm Management Association farm financial records and used in the analysis. This large sample permitted a detailed examination of the mix of pricing strategies used and factors affecting forward pricing for each of six different commodities. This distinction is important, because marketing strategies for different crops and livestock can differ significantly. These six commodities include corn, soybeans, wheat, sorghum, cattle, and hogs. Previous studies have neglected to consider pricing mechanisms for different commodities individually. This study also estimated how different farm and operator characteristics affected the percentage of commodities marketed using forward pricing techniques.

Concerns regarding a general lack of knowledge about the mix of marketing practices farmers use have been raised recently by USDA administration. Particular concerns surround whether National Agricultural Statistics Service (NASS) price statistics for commodities frequently marketed using forward

contracts are representative of prices at which commodities actually are transacted. Without more knowledge of the specific mixes of marketing methods actually being used by producers, the representativeness of reported NASS cash prices is unknown. This research provides information regarding actual usage of various pricing mechanisms for a large sample of representative farms. Results identify which commodities need additional consideration of forward contracting activity as public price data are collected and reported.

PREVIOUS RESEARCH

Adoption by producers of alternative marketing techniques has been evaluated in several previous studies. Shapiro and Brorsen analyzed futures market use by 42 Indiana crop producers at a Top Farmer Crop Workshop. Significant factors affecting hedging included managerial experience, education, a self-assessed management rating, leverage, farm size, off-farm income, expected change in income from hedging, and whether the producer believed hedging could stabilize income. Contrary to expectations, education was inversely related to the amount of hedging. Experience also was inversely related to hedging, and all other significant factors were positively related as expected. Given that their sample consisted of 42 innovative farmers participating in a university-sponsored workshop, these results cannot be generalized.

Asplund et al. evaluated factors affecting the decision of whether to use hedging and forward pricing for a sample of 353 Ohio crop farms. Forward contracting was significantly related to operator age; whether the producer had attended a general farm organization meeting; and whether the producer used computers or consultants; gross farm receipts; and leverage. Operator age and, unexpectedly, leverage negatively affected forward contracting, whereas the remaining factors had positive effects. Hedging activity of producers was affected only by whether the farm used computers or consultants and gross farm receipts.

Makus et al. analyzed the hedging activity of a sample of 595 producers from a Futures and Options Marketing Pilot Program organized to educate producers on the use of futures and options markets across 22 states. Significant determinants of hedging activity included whether the producer had been a member of a marketing club, education, gross farm sales, and the region where the producer was located. Like Asplund et al., they considered only whether the producer had hedged and not the level of crop hedged.

In closely related research, adoption of alternative production techniques by farmers has been evaluated in a number of studies. Many of these studies focused on the role of human capital as a factor influencing adoption. Huffman (1974, 1977) found that the allocative efficiency of farmers with respect to optimal fertilizer rates was related significantly to education. Wozinak reported that adoption of livestock feed additives and growth hormones increased with education. Rahm and Huffman found that adoption of reduced tillage production techniques also rose with education. Huffman and Mercier and Putler and Zilberman noted that the likelihood of computer adoption increased significantly with farmers' educational attainment.

The specific role of extension and other nonacademic educational programs in adopting new technologies has received somewhat less consideration. Huffman (1974, 1977) found that extension education had a significant effect on farmers' adoption of optimal fertilizer application. Feder and Slade reported that participation in extension education programs increased the likelihood of adopting new production technologies. Rahm and Huffman found that participation in extension education programs increased the efficiency of reduced tillage adoption. Factors influencing participation by producers in

extension educational programs were not considered in these papers. Extension and other nonacademic educational programs likely play a central role in the accumulation of the specific human capital necessary to adopt new marketing techniques.

MARKETING TECHNIQUES AND PRODUCER EDUCATION PARTICIPATION

Agricultural producers face uncertain outcomes from the adoption of new marketing techniques. When adoption is discrete (i.e., when the adoption and nonadoption decisions are mutually exclusive), farmers typically choose to adopt a given production or marketing technique if their expected utility of profits with the new technique exceeds their expected utility of profits without adoption. When partial adoption is possible (as in this analysis), producers will choose the level of adoption that maximizes their expected utility of profits.

To evaluate factors affecting adoption by farmers of forward pricing mechanisms, the proportions of each producer's crop marketed through forward pricing, futures hedging, and futures options were summed to obtain a measure of the total proportion of each crop sold through forward and futures markets. Because marketing strategies and practices for different crops may vary, it is important to evaluate forward and futures marketing for individual crops as well as the overall adoption decision.

Three separate, but related, empirical analyses were performed and are reported in this paper. First, factors affecting decisions by producers to adopt forward pricing techniques were estimated using a Probit estimation technique. This analysis examined farm business and operator characteristics that are related to whether the producer uses any form (contracting, hedging, or options) of forward pricing for any of the farm's sales. The second set of analysis estimated factors affecting the level of forward pricing (percent of sales marketed in this manner) using Tobit estimation. This analysis specifically examined the level of forward pricing for each of five commodities (wheat, corn, sorghum, soybeans, and cattle) separately. Lack of data precluded the examination of hog sales for this portion of the study. Finally, the effect of farm and farm operator characteristics on educational seminar attendance was examined.

SURVEY DATA

The data utilized in this analysis were collected from two sources. First, a survey was administered to 1,963 Kansas farms in September 1992. Producers were queried about their marketing practices for wheat, corn, sorghum, soybeans, cattle, and hogs. In particular, producers were asked to identify percentages of each commodity that were sold through cash marketing, forward contracts, futures hedges, futures options, and deferred pricing for the 1990 through 1992 crop years. Producers were also asked whether they had participated in any of the following educational programs: university extension marketing/risk management seminars; commodity exchange marketing seminars (e.g., CME, CBOT, etc.); Farm Bureau marketing/risk management seminars; and any other private or public marketing/risk management seminars.

The survey data were matched to a set of detailed farm management records for 1991 for each farm from the Kansas Farm Management Association data bank. Of the 1,963 farms surveyed, 618 questionnaires were returned, corresponding to a 31.5% response rate. Of these, 79 were dropped from the sample because of incomplete responses, leaving 539 observations for analysis. A summary of the percentage of producers that marketed each of the six commodities is reported in Figure 1. As can be

observed, 85% of the survey respondents produced wheat and 60% produced sorghum. Most producers, of course, produced several of the commodities.

Summary statistics of characteristics of the farms responding to the survey are reported in Table 1. Nearly half of the producers used some form of forward pricing (forward contracting, hedging, or options) to price their sales from 1990 through 1992. Over 66% of the producers indicated that they had participated in one or more marketing/risk management seminars. The average producer had 30 years of experience; age ranged from 22 to 85 years. The average acreage managed was 1,550 acres (crop acreage averaged 1045). The average education level of the producers included 2 years of college. Producers spent an average of 4 hours per week reading publications pertinent to the management of their operations. The average farm had a leverage ratio of 40%. Sixty-one percent of the producers indicated that they faced more risk from price variability than yield variability. Important to note is that the data in this study do not include the large custom cattle feedyards so prevalent in Kansas (very few are members of the Kansas Farm Management Association). Thus, results for cattle represent primarily cow-calf and farmer-feeder operations.

PRODUCER PRICING METHODS

The pricing methods used by the entire set of 539 respondent farms are reported in Figure 2. Overall, 98% of the producers marketed at least some of their sales in the cash market. The next most popular pricing method was forward contracting, with 45% of the producers marketing at least a portion of their sales using forward contracts. Commodity options on futures contracts were used by 19% of the producers. Hedging and deferred pricing were used by the fewest producers.

The percentage of producers using forward pricing varied by commodity, as did the percentage of total production forward priced (Figure 3). The percent of total production forward priced is weighted by the volume of commodity the farmer produced (bushels for crops and dollars of sales for livestock) and the percentage forward priced. Forty-one percent of wheat producers forward priced (forward contract, hedge, or options) at least a portion of their crop, cumulating to 24% of the wheat produced by the survey respondents. Corn had the highest percent of production forward priced, with 46% of the producers forward pricing at least some of their corn crop, accounting for 33% of total corn production of survey respondent farms. Because corn is often forward contracted with commercial feedyards in Kansas, this result was not unexpected. Sorghum producers, on the other hand, generally do not have similar opportunities, and as a result, they forward priced only 10% of total production. Livestock had little forward pricing, representing 8% of cattle sales and virtually none of the hog sales. Recall that large custom cattle feedyards prevalent in Kansas are not represented in the data base, so results for cattle represent primarily cow-calf and farmer-feeder operations. These findings suggest that, although cash markets still represent the vast majority of commodity trade, forward pricing is quite common and represents significant volumes of trade, especially for corn, wheat, and soybeans.

Figures 4 through 8 illustrate the pricing methods used for each commodity. Cash marketing was used by at least 93% of the producers (Figure 4) for each commodity. Clearly, cash marketing was used at least to some extent by the vast majority of the producers in the survey. Considerable use of forward contracting across commodities was also evident (Figure 5). Over 30% of wheat, corn, and soybean producers used forward contracting to market their crops. Proportions of sorghum, cattle, and hog producers using forward marketing were considerably lower.

Use of futures market hedging in the marketing activities of crop and livestock producers was quite limited (Figure 6). Corn had the largest percentage of producers hedging (11%), followed by cattle producers. For the other commodities, use by producers of futures hedges was limited, each being less than 6%. Wheat, sorghum, and cattle producers were more likely to use futures options than futures hedging techniques in their marketing activities (Figure 7). Roughly 15% of the wheat producers used futures options. Likewise, 10% of the cattle and corn producers used futures options. Less than 5% of soybean, grain sorghum, and hog producers used futures options in marketing their commodities. Use of deferred pricing techniques was quite limited for all of the commodities, being highest for corn and soybean producers at 7% (Figure 8).

Important information regarding futures and forward marketing practices also can be gleaned from an evaluation of the degree of use of the alternatives (i.e., the proportion of crop sold under each alternative). Table 2 contains average proportions of each crop sold by the alternative methods for the subsamples of producers using each method. Clearly, producers, on average, marketed significant proportions of their commodity with a particular method if they used the method at all. Of wheat producers using cash marketing, the average producer sold 85% of the crop in the cash market. Likewise, for the other subsets of producers using cash marketing, averages sold in the cash market ranged from 80.9% of corn to 95.8% for hogs.

Of the producers using forward contracting, the average proportions of crops marketed through this method were between 30% and 40%. The average proportions marketed through futures hedges were typically between 20% and 30%. The most intensive use of futures hedging occurred for corn, for which an average of 34% of the crop was marketed through futures hedging by those using hedges. Of producers using futures options, the proportion of the commodity marketed through options averaged between 30% and 45%.

A small proportion of the producers used deferred pricing. However, for those producers that did defer the pricing of their commodity, the average proportions of their crops sold in this manner were quite high. For crops, the averages ranged from 29% to 48%. Only two of the cattle producers and one hog producer in the sample used deferred pricing.

The results summarized above suggest that producer use of forward pricing has increased significantly over the last 20 years. Figure 9 illustrates the increase in forward pricing by Kansas producers over the 1972 through 1992 period using data from a 1972 survey by Hill and a 1983 survey by Tierney. Results from this study indicate that, by 1992, 45% of producers used forward contracting. Futures hedging growth was more moderate. However, options on futures (which were not available until 1986) had considerable use, with 19% of the producers indicating at least some use during the last 3 years.

FORWARD PRICING ADOPTION

A number of variables were hypothesized to be relevant to adoption by producers of forward pricing techniques. Statistically significant determinants of forward pricing adoption are reported in Table 3. More experienced producers forward priced less than less experienced producers. For each additional year of experience, the average producer had a 0.82% lower probability of using forward pricing methods. This result is in agreement with Asplund et al. and Shapiro and Brorsen who found that older, more experienced producers did not use forward pricing as much as younger producers. The probability of adopting forward pricing techniques increased with farm size. Each additional 100 acres of land managed was associated with a 1.2% increase in probability of using forward pricing methods. Crop

acres were more important than noncrop acreage in determining whether a producer adopted forward pricing. Each 10% increase in the proportion of land that was in crops increased the probability of forward pricing by 4.9%.

More highly leveraged farms are expected to be more dependent upon risk management techniques and, thus, are more likely to adopt forward pricing techniques. In addition, lenders may impose forward pricing constraints on highly leveraged borrowers. A strong, significantly positive effect of leverage on the probability of adopting forward pricing methods was confirmed in the Probit analysis. The probability of adoption rose by 2.1% for each additional 10% of leverage (debts/assets).

The intensity of a farm's investment in variable production inputs is expected to be positively related to adoption of forward pricing techniques as a means of addressing price risk. Farms with a larger investment in variable inputs face a greater exposure to risk. Expenditures for fertilizer and agricultural chemicals per crop acre (variable costs per dollar of sales for livestock producers) were included to represent the intensity of the farm's investment in variable production inputs. As expected, input intensity had a significant positive effect on the probability of adopting forward pricing techniques. Each additional dollar spent per unit raised the probability of adoption of forward pricing by 0.76%.

Participation in risk management and marketing seminars is hypothesized to increase the likelihood that producers will adopt forward pricing methods. This effect was confirmed in that producers who participated in educational programs were 21.1% more likely to use forward pricing methods than producers who did not participate. The effect of seminars on the adoption decision was highly significant, suggesting that educational efforts lead to changes in farmers' marketing practices. This result is consistent with previous work by Makus et al. and Asplund et al., who also found that participation in seminars and marketing clubs increased the use of forward pricing techniques.

FORWARD PRICING LEVELS

Marketing practices may differ widely for alternative crop and livestock commodities. Forward and futures markets for different commodities have distinctive characteristics and, thus, adoption of forward pricing techniques may vary across different commodities. To further evaluate the adoption decision, an alternative analysis of adoption practices for five different commodities (wheat, corn, grain sorghum, soybeans, and cattle) was considered. In particular, this analysis was intended to investigate the levels of forward pricing used.

Many factors affect the adoption of forward pricing techniques for alternative crops in a similar manner. However, several important differences among the different commodities were revealed. The use of forward pricing increased at a decreasing rate as the acres of each crop planted increased. This result was significant for wheat, corn, and soybeans. Figure 10 illustrates the average impact on forward contracting activity, holding all else constant as acreage of each crop increased. For wheat and soybean producers, the average percentage of crop sold using forward pricing increased by roughly 10% from size alone, holding all else constant, up to an acreage of 700 to 900 acres of the specific crop. Beyond that size, forward pricing percent declined. Forward pricing increased by roughly 20% for corn producers having 400 to 600 acres, holding all else constant, and declined for larger farms.

Table 4 summarizes other statistically significant factors affecting the level of forward pricing used by producers across the five commodities. Experience was negatively related to forward pricing by wheat producers, with each year of experience reducing forward pricing by 0.26% on average. Experience was

not significant for the other four commodities. Input intensity, measured by total expenditures on fertilizers and agricultural chemicals in crop production per acre (total variable cost of production per dollar of output in cattle production), positively influenced forward pricing activity for sorghum and soybean producers. Each additional dollar in variable cost was associated with a 0.21% increase in forward pricing of sorghum and a 0.32% increase in forward pricing of soybeans.

Education positively affected forward pricing for soybeans and corn, with each additional year increasing forward pricing by 2.11% and 1.25%, respectively. The proportion of total acres allocated to crops significantly increased forward pricing activity for wheat, corn, and sorghum. For each 10% increase in crop acres relative to total acreage, forward pricing increased by 1.2% to 2.1%.

Increased leverage had a positive effect on the level of forward pricing for all commodities, though the effect was statistically significant only for wheat, corn, and cattle. A 10% increase in leverage was associated with a 0.5% to 0.9% increase in forward pricing. This is consistent with the idea that more highly leveraged producers require the greater risk protection offered by forward pricing.

Previous participation in marketing/risk management seminars was positively correlated with the level of forward pricing in every case, although the effect was statistically significant only for wheat, soybeans, and cattle. Seminar attendance increased forward pricing levels by 7% to 10%. Wheat and cattle are the dominant commodities in Kansas. Therefore, marketing seminars and other extension activities in Kansas are typically focused on these commodities. These results may reflect the fact that the educational activities experienced by these producers were strongly centered on wheat and cattle marketing.

With the exception of input intensity and the percent of total acres devoted to crops, the model of forward pricing adoption by grain sorghum producers did not reveal significant factors affecting adoption. This may be a result of the fact that forward and futures markets for grain sorghum are very thin and illiquid. A futures market for grain sorghum was established at the Kansas City Board of Trade in May of 1989 but never developed sufficient volume of trading activity to be viable. Producers pursuing futures hedges and options for grain sorghum often consider cross-hedging alternatives in the corn market. Figures 4 through 7 indicate that only a small percentage of grain sorghum producers utilized any form of forward pricing techniques.

MARKETING/RISK MANAGEMENT SEMINAR ATTENDANCE

Attendance at educational seminars significantly influenced both the likelihood and level of forward pricing adoption by producers. Given the considerable resources devoted to this effort, of interest here was which farm and operator factors affect educational seminar attendance. This is important both for private and public associations who design and deliver such education programs. As noted earlier, roughly two-thirds of the survey respondents had attended a marketing/risk management seminar. Figure 11 illustrates participation in such a seminar by producers of the six commodities. Participation rates were quite consistent across commodities, ranging from 62% for producers of hogs to 70% for corn producers.

Significant factors affecting seminar attendance are reported in Table 5. More experienced (older) farmers were less likely to participate in educational programs. The probability of participation fell by 0.5% with each additional year of experience. This result agrees with expectations that older individuals have lower returns from education and, thus, are less likely to participate in educational programs. Participation increased as farm size rose, indicating that producers with larger operations were more

likely to participate in educational programs. Each additional 100 acres increased the likelihood of attendance by 1.2%. This reflects the fact that returns to a fixed educational investment are likely to be greater for producers with greater acreage.

The miles that a producer lived from the nearest town were included in the seminar equation to represent the transactions costs associated with attending educational seminars. Extension programs are typically held within town centers, and producers who reside far from a town are likely to face larger costs to attend them. A significant negative effect was revealed; with each mile that a producer lived outside of the nearest town, the probability of participation fell by 1.5%.

Producer preferences for farm-related education were represented by the number of hours per week that the producer spent reading farm-related publications. The hours spent reading had a significant positive effect on the probability that the producer would attend educational seminars. The likelihood of participating in educational programs rose by 2.1% for each additional hour of reading time. A producer's formal educational attainment, measured by their years of formal schooling, had a strong positive effect on the probability that they would participate in educational programs. The probability of participation rose by 3.1% for each additional year of formal education. Evidently, returns to participating in marketing/risk management seminars are larger for individuals with more education.

Futures markets have been established longer for crops than for livestock commodities. Thus, crop producers may be more familiar with forward pricing techniques than livestock producers. The percentage of the farm's total acres that were actively engaged in crop production (versus pasture land, set-asides, and waste) was included to measure the intensity of crops in the farm's overall enterprise. The percentage of crop acres had a strong positive effect on participation in educational programs. The probability of participation rose by 2.3% for each 10% rise in crops' share of total farm acres.

Farms that are more highly leveraged are expected to depend upon risk management tools to a greater extent. Previous research (Asplund et al. and Shapiro and Brorsen) found that the use of forward pricing methods increased with leverage. Harris and Baker found that 70.6% of lenders responding to a survey indicated that hedging increased a farmer's loan limits. Thus, highly leveraged farms are likely to realize greater returns from marketing/risk management education and are expected to be more likely to participate in educational programs. This effect was confirmed in our results, which showed that the probability of participation rose by 1% with each 10% increase in the leverage ratio. Farmers that stated a preference for business risk were significantly more likely (11.2%) to participate in educational programs.

CONCLUDING REMARKS

This paper examined marketing practices of Kansas agricultural producers and factors affecting the adoption of forward pricing techniques. Particular attention was given to the role of human capital accumulation by producers and its resulting effect on the adoption of forward pricing techniques. Considerable educational efforts have been put forth from both public (e.g., extension programs) and private (e.g., commodity exchange programs) sources to make producers aware of alternative marketing techniques and to teach them how to utilize such techniques in risk management.

Of the sample of 539 farmers evaluated in this analysis, two-thirds had participated in these educational programs. An analysis of the factors related to participation in educational programs revealed that the probability of participation rose with farm size, previous educational attainment, crop intensity (percent of total farm acres used in crop production), leverage, and risk preference. Conversely,

participation in educational programs fell with years of experience (age). Farmers that resided far from the nearest town also were significantly less likely to attend educational seminars. Finally, farmers who spent a considerable amount of time reading farm publications were more likely to participate in educational programs.

Approximately 50% of the farmers surveyed had adopted forward pricing techniques to some extent. This amount varied considerably by commodity. In addition, total production forward priced ranged from a high of 33% for corn to a low of none for hogs. Wheat and soybeans each had over 20% of production forward priced. Thus, cash markets, although still prevalent, do not necessarily represent an overwhelming share of marketing methods.

Forward pricing adoption decreased with years of experience, confirming results of other studies that had found that older, more experienced farmers were less likely to use forward pricing techniques. Adoption increased with farm size, crop intensity, input intensity, and leverage. Although previous educational attainment significantly influenced participation in educational programs, it did not exhibit a significant effect on the actual adoption of forward pricing techniques.

An important result is that participation in marketing/risk management educational programs significantly increased the probability of adopting forward pricing techniques. This result was confirmed for wheat, soybeans, and cattle in models of the extent of adoption for individual commodities. Apparently, such educational programs have been effective in encouraging adoption of alternative marketing technologies, particularly in the case of wheat and cattle producers in Kansas.

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Table 1. Summary Statistics of Survey Respondents.

Variable	Mean	Standard Deviation
Used Forward Pricing (%)	49.2	50.1
Attended Seminars (%)	66.6	47.2
Experience (Years)	30.2	12.9
Acres Managed	1550	1244
Crop Acres	1045	931
Wheat Acres	412	393
Corn Acres	85	16
Sorghum Acres	156	204
Soybean Acres	103	194
Cattle Sales (\$1000)	21.0	42.6
Hog Sales (\$1000)	15.0	95.2
Miles to Nearest Town	7.6	13.0
Hours Read per Week	4.1	3.1
Education (Years)	14.2	6.9
Debt to Assets (%)	40.3	40.3

Table 2. Average Percentages of Each Crop Sold by Alternative Marketing Methods (for Subsamples of Producers Using Respective Methods)^a

Marketing Method	Commodity ^a					
	Wheat	Corn	Sorghum	Soybeans	Cattle	Hogs
	----- (Percent) -----					
Cash Marketing	85.37 (21.66)	80.92 (26.57)	92.41 (17.35)	85.99 (21.99)	91.38 (19.07)	95.83 (17.11)
Forward Contracting	29.95 (21.12)	37.18 (23.01)	35.41 (24.68)	33.27 (19.33)	34.03 (26.90)	20.00 - ^b
13 Futures Hedge	22.88 (20.70)	33.84 (22.95)	21.67 (15.71)	28.65 (25.30)	25.04 (17.02)	10.00 (0.00)
Futures Options	33.53 (26.87)	29.24 (23.48)	37.00 (37.23)	36.59 (34.68)	44.67 (29.83)	15.67 (12.10)
Deferred Pricing	29.04 (20.90)	32.15 (24.11)	30.06 (20.32)	47.71 (32.85)	25.00 (35.36)	15.00 - ^b

^aNumbers in parentheses are standard deviations.

^bCalculated from a single observation.

Table 3. Factors Affecting Forward Pricing Adoption.

Variable	Estimate ^a
Experience (Years)	-0.82
Acres Managed (1000 Acres)	12.4
Crop Acres (Proportion of Total)	49.4
Debt to Assets (%)	0.21
Input Intensity (\$/unit) ^b	0.76
Seminar Attendance	21.1

^aEstimate is the impact on the probability of the producer adopting forward pricing given a one unit change in the variable.

^bInput intensity includes fertilizer and chemical costs per acre (\$/acre) for crops and total variable costs per dollar of sales for livestock.

Table 4. Estimates of Significant Factors Affecting the Level of Forward Pricing, by Commodity.

Variable	Wheat	Corn	Sorghum	Soybeans	Cattle
Experience (Years)	-0.26	- ^a	-	-	-
Input Intensity ^b	-	-	0.21	0.32	-
Education (Years)	-	2.11	-	1.25	-
Crop Acres (Proportion of Total)	16.44	20.99	12.26	-	-
Debt to Assets (%)	0.05	0.08	-	-	0.09
Seminar Attendance	10.14	-	-	7.24	7.96

^aNot statistically significant.

^bInput intensity includes fertilizer and chemical costs per acre (\$/acre) for crops and total variable costs per dollar of sales for livestock.

Table 5. Factors Affecting Seminar Attendance.

Variable	Estimate ^a
Experience (Years)	-0.5
Acres Managed (1000 Acres)	11.9
Distance to Nearest Town (Miles)	-1.5
Hours Read per Week (Hours)	2.1
Education (Years)	3.1
Crop Acres (Proportion of Total)	23.8
Debt to Assets (%)	0.1
Risk Preference ^b	11.2

^aEstimate is the impact on the probability of the producer attending a Marketing/Risk Management Seminar given a one unit change in the variable.

^bRisk preference is a variable equal to one if the producer indicated a preference for business risk and zero otherwise.

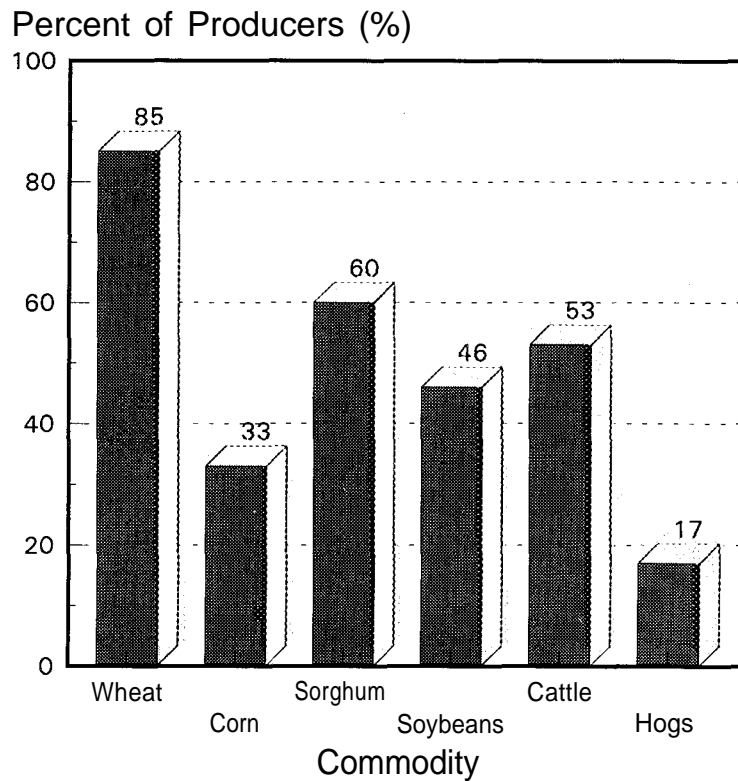


Figure 1. Percentage of Survey Respondents Producing Each Commodity.

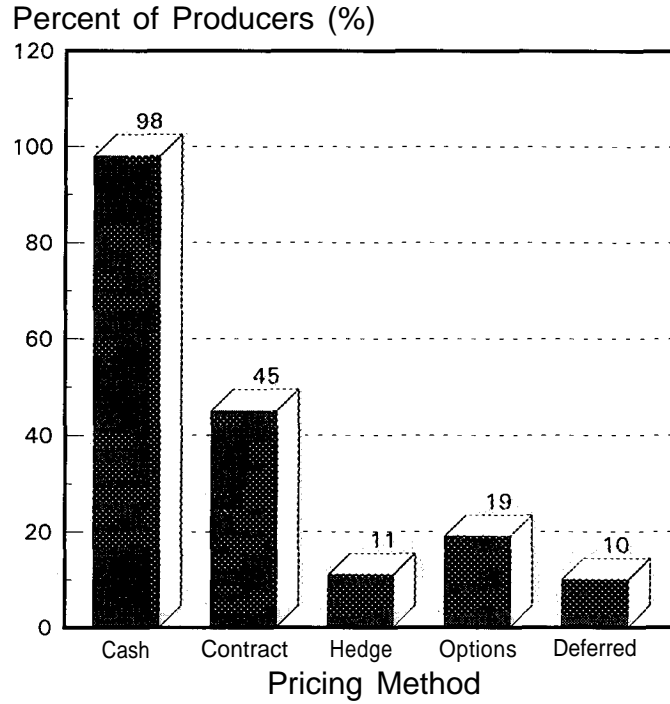


Figure 2. Percentage of Producers Using Various Pricing Methods.

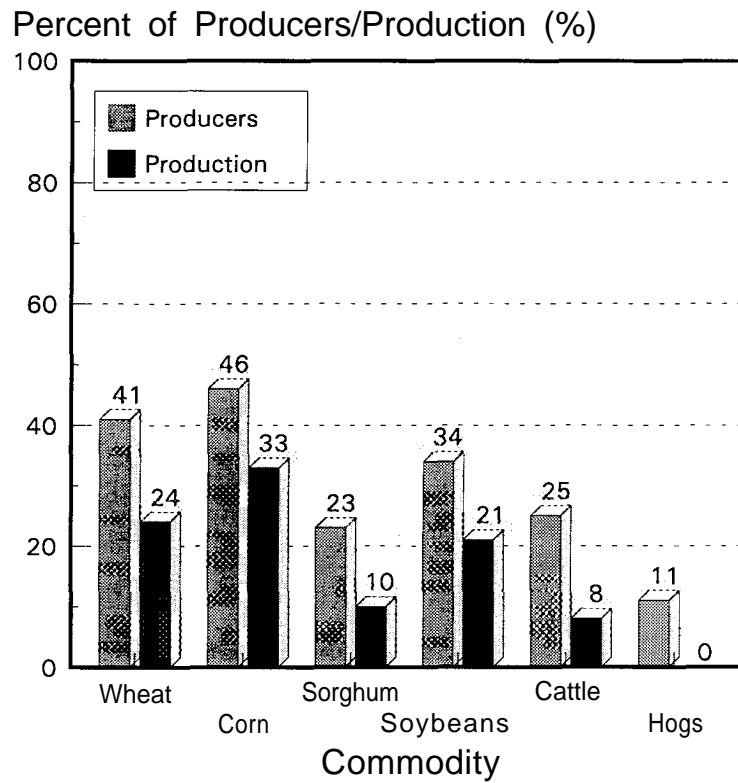


Figure 3. Percentage of Producers Who Forward Priced and Percentage of Production Forward Priced, by Commodity.

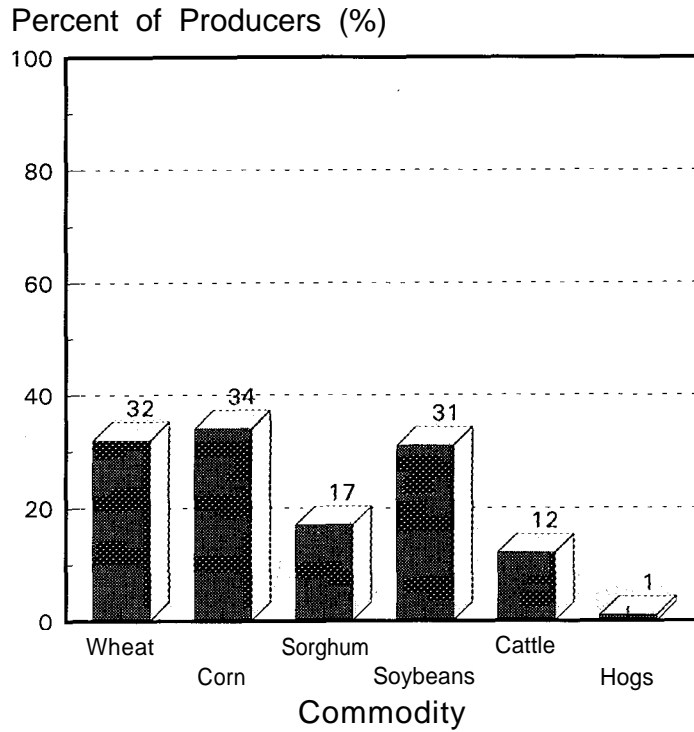


Figure 4. Percentage of Producers Using Cash Market, by Commodity.

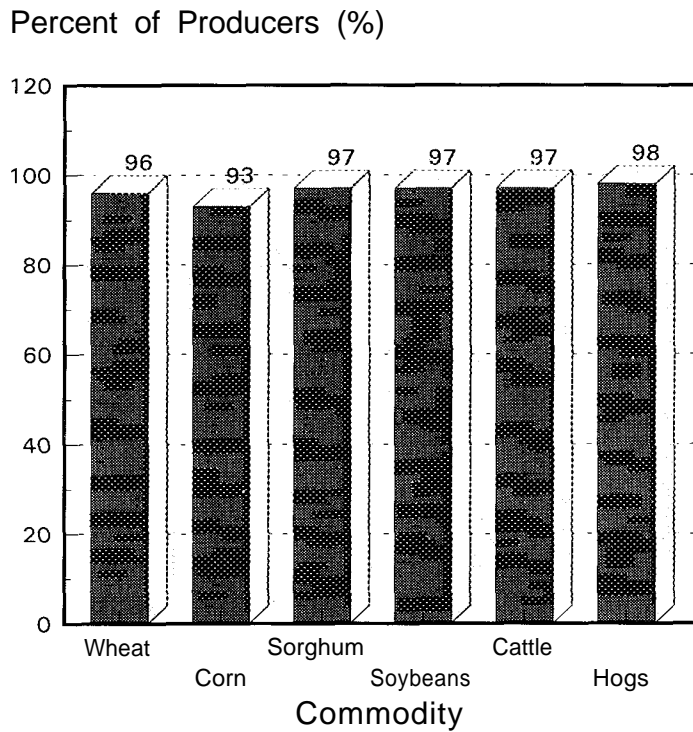


Figure 5. Percentage of Producers Using Forward Contracts, by Commodity.

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Graphs for Figs. 4 and 5
are reversed.

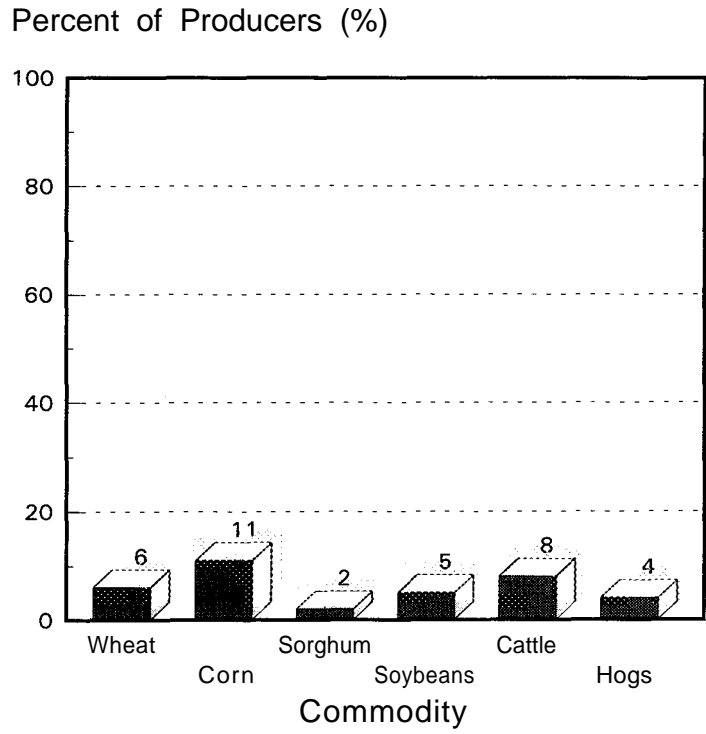


Figure 6. Percentage of Producers Using Futures Hedges, by Commodity.

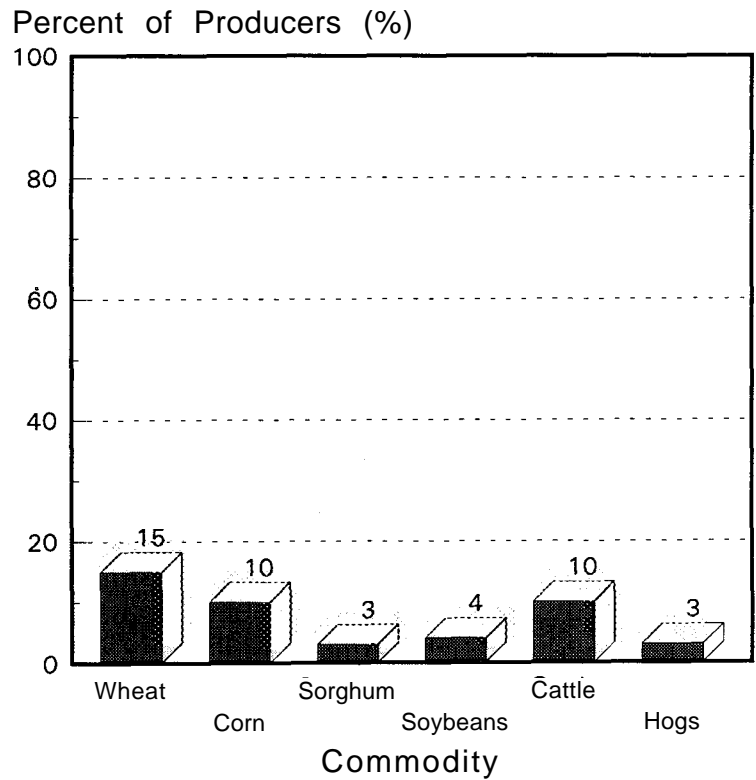


Figure 7. Percentage of Producers Using Options, by Commodity.

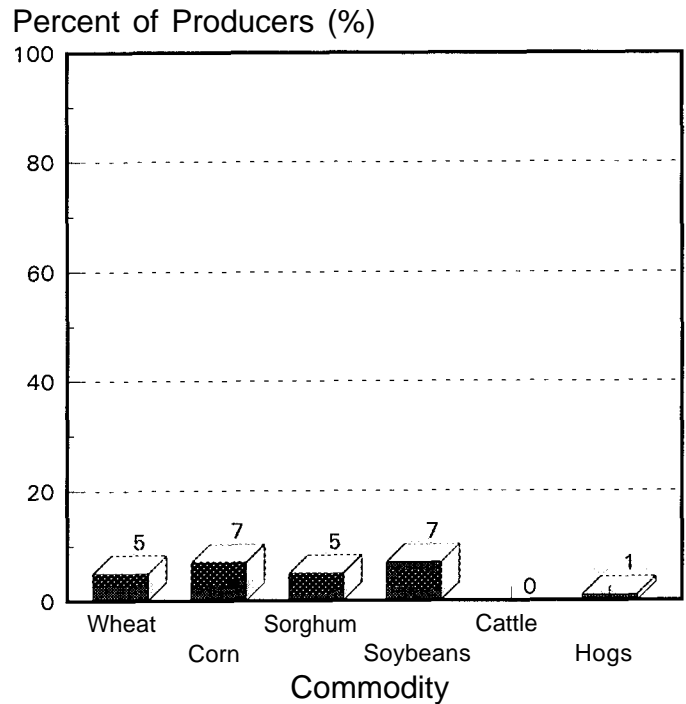


Figure 8. Percentage of Producers Using Deferred Pricing, by Commodity.

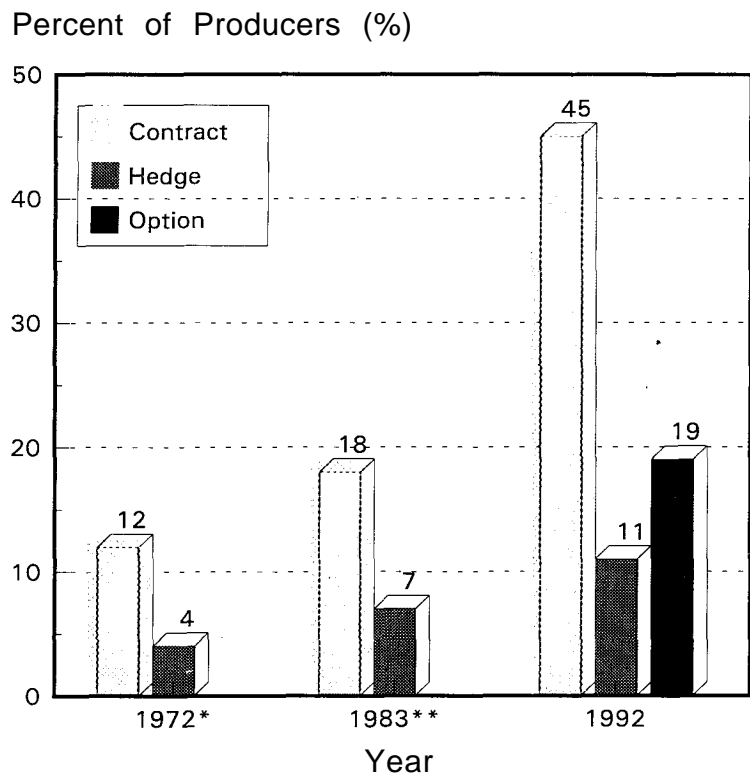


Figure 9. Percentage of Producers Using Forward Pricing, 1972, 1983, and 1992. Sources: * L.D. Hill and ** W.I. Tierney.

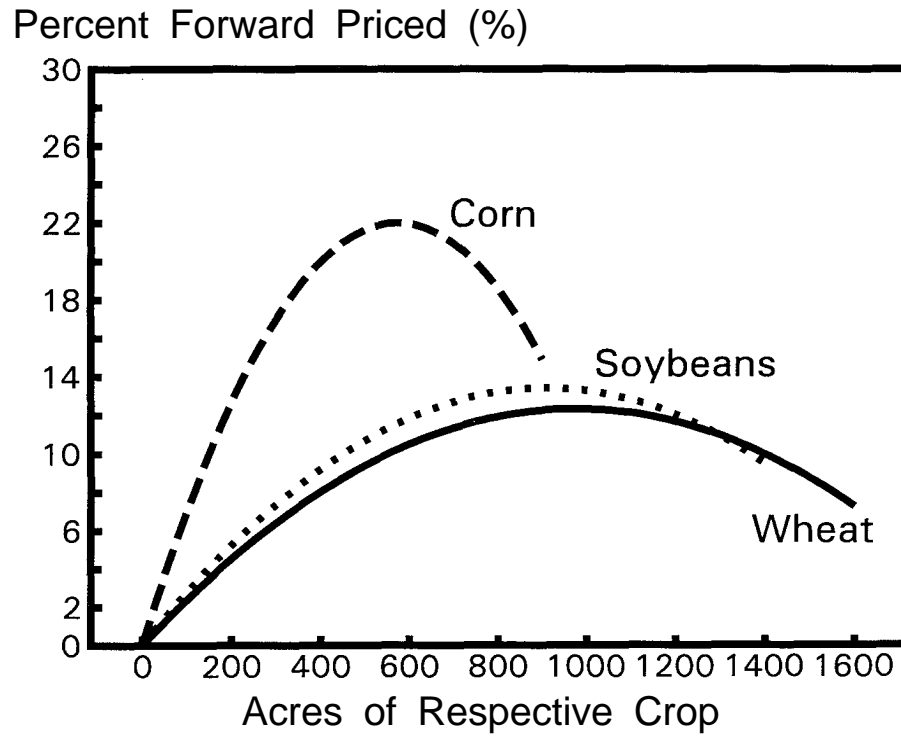


Figure 10. Influence of Farm Size on Forward Pricing for Selected Commodities.

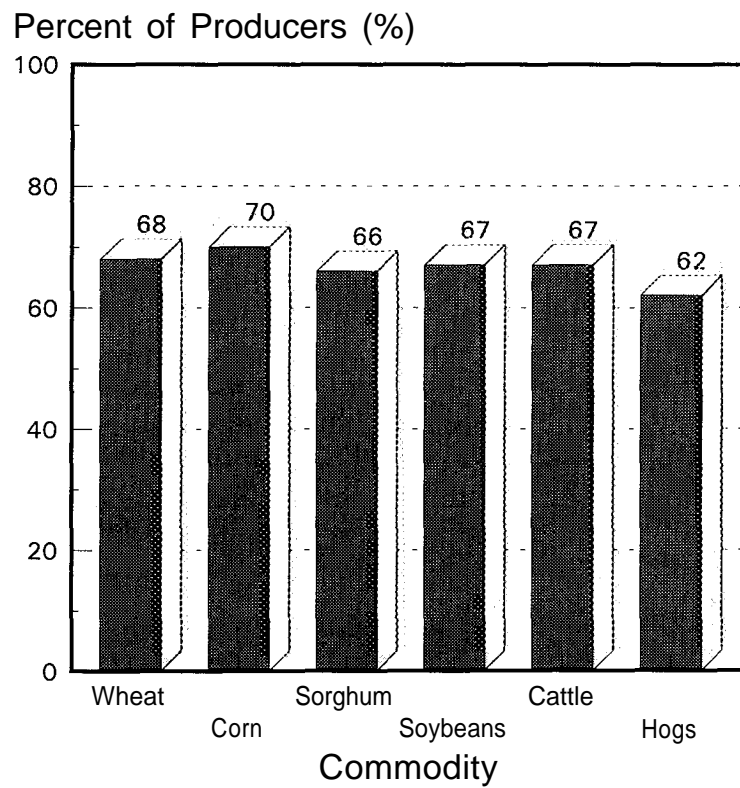


Figure 11. Percentage of Survey Respondents Who Attended a Marketing/Risk Management Seminar, by Commodity Produced.

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