REVEALED CHARACTERISTICS FOR A GRAIN ELECTRONIC MARKET

By

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CHAPTER I

INTRODUCTION

Electronic marketing involves the use of telecommunications and data equipment processing equipment to create a centralized trading arena where large numbers of buyers and sellers can participate in the trading process. Trading is based on product descriptions; physical assembly of the product is not necessary. Electronic markets are of relatively recent origin and have been gaining increased attention.

The interest in electronic markets for many agricultural commodities stems largely from the trend towards thin open markets and rapidly advancing technology. Thin markets are characterized by low volume, lack of competition among bidders, inadequate, and delayed market information and a high potential for price manipulation (Henderson, Schrader and Turner, 1976).

Canada was the first country to successfully implement electronic marketing when in 1961 slaughter hogs were sold in Ontario using a teletype communication system (Peer, 1976). Later, similar systems were used in Manitoba (Lowe, 1968) and Alberta (Hawkins, 1972). In the United States, conference telephone auctions are being used in at least eight states to sell feeder pigs, slaughter hogs, feeder and slaughter lambs, and feeder and slaughter cattle (Henderson et al, 1976). Cattle, hogs, lambs, and cotton have been traded using computerized systems.

Problematic Situation

Several conditions are important for an electronic market for agricultural commodities to be successful (Henderson et al., 1976). These include the following:

1. Potentially competitive markets;
2. Trader interest;
3. Commodity description;
4. High volume;
5. Trader education;
6. Performance guarantees;
7. Grading systems; and
8. Large volume trading.

Research has suggested that electronic marketing has the theoretical potential to increase both technical and pricing efficiency (Henderson et al., 1976; Henderson, Schrader, Sporleder and Baldwin, 1979). This has also been supported by a limited amount of empirical work (Engleman, Holder and Paul, 1979; Helmreich, Epperson and Huang, 1980; Henderson et al., 1979; Henderson and Baldwin, 1981; Holder, 1979; Lu, 1968; Lu, 1969).

Technical efficiency is improved by reducing the marketing costs through reduced multiple handling, cross hauling, number of transactions and time required. Encouraging the use of value related descriptive terms, providing accurate and timely market information to all participants, and increasing the number of buyers should improve pricing efficiency (Russell and Purcell, July 1980). Various groups in the market are affected by electronic marketing. Agribusiness firms stand to lose - as farmers stand to gain - to the extent that electronic

markets bypass existing marketing institutions and agents. Consumers should realize long term benefits from improved allocation of resources and coordination in the industry in which electronic markets are adopted (Henderson et al., 1976).

However, electronic markets would not reduce future uncertainty nor would farmers' market power be enhanced. All the theoretical and empirical research which is supportive of electronic marketing may not prove to be true in actual situations. There have been failures in getting some electronic markets to operate commercially. Some striking examples are the unsuccessful lamb teleauction in the early 1960's in Virginia (Holder, 1979), little participation in Egg Clearinghouse Inc.'s electronic marketing system for eggs (Schlei, 1980), closure of a computerized slaughter hog auction system in Ohio due to insufficient consignments (Henderson and Baldwin, 1981), and the unsuccessful attempts to sell slaughter cows by computer in Virginia (Russell, 1981).

An electronic market for grains may have potential. Grains have some distinct advantages over other agricultural commodities, in that they are not easily perishable and can more easily be described by mutually acceptable grades and standards.

The Grain Electronic Marketing (GEM) project at Oklahoma State University is a jointly funded project of the Agricultural Marketing Service, United States Department of Agriculture and Oklahoma State University. The objectives of this project are to conceptualize a Grain Electronic Market for hard red winter wheat, corn and soybeans and to determine the economic feasibility of Grain Electronic Markets. Specifically the objectives are:

1. To determine the strengths and weaknesses of the existing grain marketing system;
2. To examine the potential application of existing electronic marketing and videotex systems;
3. To determine market participant's expected benefits and objectives for an electronic marketing system; and
4. To specify the desirable characteristics of an electronic marketing system including equipment, software and institutional requirements.

The Problem

Few studies have looked at the potential of electronic marketing of grains. The only study to date was limited to Georgia producers (Turner, Epperson and Fletcher, 1983). Many attempts to implement electronic marketing have failed for varied reasons.

Russell and Purcell have examined the causes for the failure of a computerized auction system for slaughter livestock and have emphasized the need for careful planning and rehearsal before actually implementing the system.

The success of an electronic marketing system for grains depends largely on acceptance and benefits perceived by its potential users, namely producers and elevator managers. It is important, therefore, to give high priority to the choices and preferences of would be users. The attitudes and preferences of grain producers and elevator managers toward a potential grain electronic marketing system are not currently known.

Objectives

The objective of this study is to describe the important characteristics of a grain electronic marketing system based on the responses of grain producers, elevator managers and officers, and feedlot operators in a survey questionnaire. Areas of agreement and disagreement between varied respondent categories will be discussed.

Review of Literature

Available literature on designing electronic markets for agricultural commodities (particularly grains) is limited. Little work has concentrated on identifying important system or participant characteristics and designing new systems.

Henderson, Schrader, and Turner (1976) suggested that electronic marketing could be a viable market alternative to the trend towards thin open markets for many agricultural commodities. Prices in such markets may not be accurate measures of product value due to low volume, lack of competition among bidders, inadequate information, inaccessibility to traders and a high potential for price manipulation. Electronic markets combine two distinct but often combined marketing function - negotiating the trade and physical transfer of the product from seller to buyer. Types of electronic markets in use are:

1. Manual trading systems;
2. Telephone auctions;
3. Teletype auctions; and
4. Computerized trading systems.

Anticipated gains from electronic marketing are increased pricing accuracy, market coordination, marketing efficiency, equity, and

fairness. Some losses could be an inflexible and unprogressive industry if grades and standards become overly rigid, no increase in farmer's market power, nor any reduction in future price uncertainty. The groups standing to gain would be farmers and in the long run consumers. Henderson, Schrader and Turner (1976) argued that agribusiness firms, tend to be the losers due to their being bypassed by electronic markets. However, an aggressive and innovative marketing firm could emerge as a significant benefactor if it takes the lead in developing and implementing an electronic market.

Bell, Henderson, Holder, Purcell, Russell, Sporleder and Ward (1984) described electronic markets, presented the need for electronic marketing and proposed general procedures for establishing an electronic marketing system. Electronic markets capture the advantages of centralized selling while avoiding the disadvantages of physical assembly of the product, buyers and sellers. The current agricultural marketing industry is plagued with several problems and imperfections. An electronic market must perform four functions:

1. Describe the product;
2. Identify the traders;
3. Negotiate the sale; and
4. Transfer the product.

Various electronic markets and the commodities for which they are used are identified by Bell et al. (1984):

1. Telephone auctions for feeder pigs, slaughter lambs, slaughter cattle and feeder cattle;
2. Video Auctions for feeder cattle, slaughter cattle, feeder lambs, breeding sheep and breeding cattle, and

3. Computerized marketing systems.

   A. TELCOT was started in 1975 by Plains Cotton Co-operative Association. It now serves the major cotton growing, selling and buying areas throughout the United States.

   B. Egg Clearing House Inc., was organized in 1971 for "nest run" eggs. In 1978 ECI installed 55 terminals for use by traders.

   C. National Electronic Marketing Association (NEMA) was developed for market lambs and slaughter cows by Virginia Tech and the Virginia Department of Agriculture and Consumer Services.

   D. CATTLEX is used for feeder cattle and was developed at Texas A & M University.

   E. HAMS was developed and tested by the Ohio State University for slaughter hogs.

   F. CATS was developed by the University of Illinois and Illinois Department of Agriculture for wholesale meat. It did not attract enough participants to make the system economically feasible.

Computerized marketing systems have three key elements:

1. Hardware;
2. Software; and
3. The communications network.

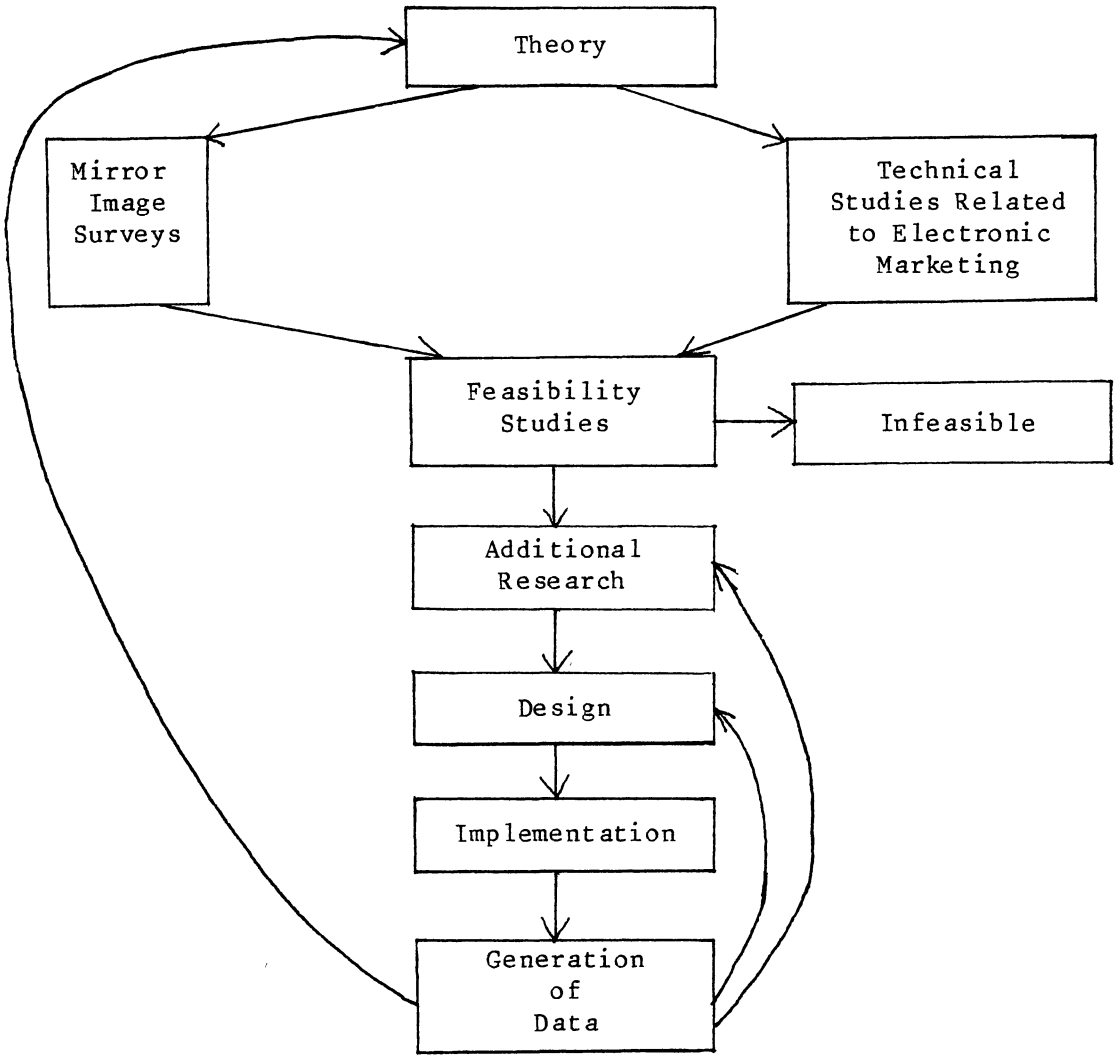
Early involvement of potential users of the system is of key importance in starting with electronic marketing.

Russell and Purcell (August, 1983) stressed that determining the feasibility, design and implementation of an electronic marketing

system relies upon the theories of economics, finance, organizational behavior and other disciplines. Mirror image surveys and technical studies are needed to produce an accurate and well designed feasibility study. A mirror image survey involves the use of paired questions to examine key areas of concern along two related stages of economic activity in a marketing system. Such surveys provide a useful vehicle to examine the attitudes of buyers and sellers towards the present marketing system and desired characteristics of a proposed electronic marketing system. Areas of agreement and disagreement become readily apparent. A conceptual framework for determining the feasibility, design and implementation of an electronic marketing system was presented (Figure 1).

Electronic marketing systems will not be feasible in all situations. Feasibility must first be determined followed by proper design and implementation which will, to a large extent, determine the success of the system.

Russell (1981) used personal experiences as well as analysis of the data generated by Electronic Marketing Association Inc., (EMA)'s electronic marketing system for his study. It was built around the working hypothesis that an increase in the theoretical and empirical base of knowledge about electronic marketing will aid in determining its feasibility and in system design, implementation and evaluation. He concluded that electronic marketing does appear to have the potential to increase technical and pricing efficiency. He also examined the theoretical foundation of the investment decision and potential trader motivation for electronic marketing. He also stressed the need for an educational effect to underscore the potential benefits accruing



(Source: Russell, James R., "Electronic Marketing: Conceptual, Theoretical, and empirical considerations," Unpublished Ph.D. dissertation, Virginia Tech, December, 1981.)

Figure 1. Conceptual Framework for Determining the Feasibility, Design and Implementation of Electronic Marketing System.

to traders should the system be successful. Mirror image surveys and technical studies should be used for conceptualizing the system for later design and implementation. The design of an electronic marketing system may be subdivided into organizational, hardware, software and procedural design. The involvement of industry leaders early in design and development is vital. Mirror image surveys and technical studies should precede the development of the software.

A well designed electronic marketing system, which has been determined feasible and is the result of input from industry participants, will be implemented with less effort and a higher probability of success than a system not so designed.

Ethridge (1978) did one of the earliest studies of electronic marketing for a non-livestock agricultural commodity. He studied Telcot, a computerized remote access market for cotton. Under the Smith Doxey classification, he noted 45 grade, 23 staple length and 7 micronaire groups, making a total of 7245 distinct quality categories of cotton. This factor of heterogeneity of cotton fiber makes the determination of market price of a particular quality in a given location at a specific point in time much more complex. Telcot, operated by the Plains Cotton Cooperative Association (PCCA) in Lubbock, Texas has been in use since 1975. Producers from any of the 190 participating cooperative gins can use Telcot to sell cotton on a spot basis by the regular offer system or the firm offer system. In either case, the computer prints the invoices for both buyer and seller. No direct costs of the system are paid by the producer. The Telcot system also has the capability of handling pooled spot sales and trading forward contracts. Use of the Telcot spot marketing systems from

producers and merchants in 1977/78 has more than doubled since 1975/76.

A prerequisite for any kind of remote trading, electronic or otherwise, is a standardized grading system which is accepted by buyers and sellers. The investment cost for an electronic marketing system is high, requiring large amounts of capital. Trading volume must be sufficient to cover these costs.

The size of the initial investment in electronic markets, especially computerized markets, is such that only large organizations may be able to undertake their establishment. Electronic markets provide increased price and operational efficiencies. Geographic location of buyers and sellers may be unimportant. Merchants now subscribing to Telcot are located from Dallas, Texas to Memphis, Tennessee.

Russell and Purcell (August, 1979) used mirror image surveys to interview 20 packers and 83 producers of Virginia slaughter cattle. They then used the results of the surveys to draw implications to the development and operation of an electronic marketing system. The attitudes, experiences and expectations of producers were then compared with those of packers, to gain better insight. The producers and packers suggested characteristics which an electronic marketing system should and should not possess, with some gray areas with no clear cut answers.

Their study concluded that a new electronic marketing system for slaughter cattle should use progressive instead of regressive bidding. Producers should be given the choice of selling their cattle on a liveweight basis. A third party should do the grading. Each set of cattle should be auctioned separately. The marketing organization

should have the authority to stop a sale when it feels bids are not reflecting a fair market value and/or the producer should be able to set a reservation price for his cattle. Using breed, liveweight, quality grade, dressing percent, age, amount of finish and state of health in describing slaughter cattle should be mutually acceptable to both producers and packers. The marketing organization's manager or its board of directors should settle any disputes or disagreements that might arise. Producers and packers disagreed in some areas which have significance for an electronic marketing system. No conclusive answer could be obtained as to what type of contractual agreement (oral, written, bonded written) should be used. Answers to such questions as when title to the cattle should change, who should own and control an electronic marketing organization, whether to sell the cattle on the farm or at an assembly point and what size lots should be offered for sale were not apparent. The surveys have given a broad understanding of what the potential users (producers and packers) want in an electronic marketing system and certain aspects which they did not approve of.

Schrader (August, 1984) hypothesized the impact of electronic trading on prices. He emphasized that price is in central consideration in the evaluation of an institutional change. Electronic trading can result in net prices more favorable to both buyers and sellers simultaneously. The reasons are lower physical costs of transfer from buyers to sellers, access to more trading alternatives, reduced uncertainty and nearly perfect information. All this would cause the market structure to shift in the direction of effective competition.

Enhanced pricing accuracy occurs due to more uniform distribution of information available among traders. However, the notion of

pricing accuracy is difficult to measure. There is no counter part for the concept of price in actual dynamic markets in space, time, and form.

Studies done on the impact of electronic trading on prices in case of Egg Clearing House Inc., HAMS, NEMA, CATTLEX, TELCOT, were examined. Changes in price level have been noticed in many cases, but the evidence must be interpreted with caution. Sellers may have demanded more when selling on electronic systems (CATTLEX & ECI). There may have been some novelty effect included in the early stages. It may also be due to reduced transaction costs, a shift in market power, or both. The analyses cannot discriminate. Evidence of a price leader role for electronic trading, though initially observed, eroded over time. Since electronic trading is believed to benefit the less powerful side, the farmer, initiative for change should be forthcoming from his side. But many producers do not believe that they have a problem. Most feel they are selling at better than average prices regularly. If this attitude is common, farmers may not be ready to change their marketing methods.

Past experiences have emphasized the need for great care in developing and designing a new electronic marketing system. Some systems may have failed, not due to the lack of potential, but because of faulty planning, design and unreadiness of the system.

The system should offer its potential users what they want and not what the developer thinks they need. Potential users and experienced leaders in the industry should be involved in developing the system from the beginning.

Turner et al. (1983) used dummy variables to describe the negative/positive attitudes of producers towards a multicommodity electronic marketing system. A total of 258 producers were interviewed

with the choice of selecting either Yes or No to the questions asked. Two models were estimated, the first one used producer's initial reaction to electronic marketing as the dependent variable. The second model included 19 additional positive respondents, who switched from negative to positive with additional information. The probit procedure was used to identify factors that influence producer attitudes toward electronic marketing.

The study indicated encouraging responses toward multicommodity systems. A multicommodity system could tap more potential participants thereby reducing market costs.

Hypothesis

This study uses the working hypothesis that an increase in the empirical base of knowledge concerning grain electronic marketing will be useful to grain market participants, researchers, and other interested parties. Specifically, this information should be valuable input in evaluating the feasibility of grain electronic marketing.

CHAPTER II

PROCEDURE

Data Collection

The surveys were directed towards grain producers, elevator managers and officials, and feedlot operators in states west of the Mississippi river.

Grain Elevator Questionnaires

There were two versions of the grain elevator questionnaires. The longer version was sent to state Grain and Feed Association Officers and Directors. The shorter version was sent to a random sample of federally inspected warehouse managers. The number of questionnaires mailed and their respective response rate is given in Table I.

The primary purpose of these questionnaires was to determine the attitudes of elevator management towards Grain Electronic Marketing. Both questionnaires contained many similar questions, but the Officers and Directors Survey represented a more detailed version of the manager's survey. It included additional questions on grain sales, deliveries and the importance of grain handling operations. The questions common to both the questionnaires were those pertaining to their operational characteristics (size, type, etc.), familiarity with electronic marketing and their attitudes toward a proposed grain electronic marketing system.

Grain Producer Questionnaires

One hundred and fifty grain producers were randomly selected from the major grain producing counties in Oklahoma, Kansas, Nebraska, Iowa, Missouri, Arkansas and interviewed personally. The top two grain producing counties within each state were selected and a four mile square block was randomly selected within these counties and surveyed. The questionnaire administered under this survey constituted the longer version - involving more questions about the marketing channels used and the importance attached to presently used marketing practices.

In addition, a shorter version of this survey was sent to 1200 randomly selected wheat, corn and soybean producers in states west of the Mississippi river. The response rates are given in Table II.

Feedlot Questionnaire

To examine feedlot operator attitudes, a mail survey was conducted over a six state area in the Southern High Plains area. Three hundred twenty-four questionnaires were mailed to commercial feedlots in Oklahoma, Texas, New Mexico, Colorado, Nebraska and Kansas with a one time capacity of 5000 head or more. The survey resulted in 78 completed questionnaires yielding a 24 percent response rate.

Merging the Surveys

The objective of this study is to analyze the responses of different groups, namely, producers, elevator managers and feedlot operators toward the characteristics of a potential grain electronic marketing system. Both the producer surveys (mail out and personal interview) can be combined for analytical purposes if statistically

TABLE I

GRAIN ELEVATOR OPERATOR RESPONSE TO QUESTIONNAIRES

	Grain and Feed Association Officers and Directors	Federally Inspected Warehouse Managers
Total Questionnaires Mailed	225	612
Total Questionnaires Received	62	118
Response Rate (Percent)	27	19

(Source: Survey Data)

TABLE II

GRAIN PRODUCER RESPONSE TO QUESTIONNAIRE

	Personal Interviews	Mailed Surveys
Total Number of Questionnaires	150	1200
Total Number of Respondents	150	144
Response Rate (Percent)	100	12

(Source: Survey Data)

significant differences do not exist between the responses of the two groups. No significant differences implies that both samples are from the same population. Both the elevator surveys (officer and director survey and the Federally Inspected warehouse Survey) could be combined in a similar manner. A t-test will be used to determine if statistically significant differences exist between mean responses for each common question on the two versions of the elevator and producer questionnaire (Fox, Peck and Nickols, 1985; Steel and Torrie, 1980; Snedecor and Cochran, 1967). If 80 percent of responses to the common questions in the producer questionnaires do not have significantly different means, then the versions will be combined. Similarly, if 80 percent of the responses to the common questions in the elevator questionnaires do not have significantly different means, then the two versions of the elevator survey will be combined. It is assumed that the means X_1 and X_2 for the producer surveys and the elevator surveys are normally distributed and are independent.

Test for Equality of Variances

In testing for significantly different means, different test statistics are used depending on whether the sample variances, are different. Hence the first step is to test for equality of the sample variance. The null hypothesis is S_1^2 and S_2^2 are from independent random samples from normal populations with the same variance. A five percent significance level will be used for the statistical tests. Estimates of the population variance for each sample is calculated separately. The F test statistic is a ratio of two statistical tests. Estimates of the population variance for each sample

is calculated separately. The F test statistic is a ratio of two variances and is used when a test for equality of two variances is being made. The F test statistic is:

$$F = \frac{\text{larger of } S_1^2,\ S_2^2}{\text{smaller of } S_1^2,\ S_2^2} \qquad (1)$$

Degrees of freedom for F are (n_1-1) and (n_2-1), where n_1 and n_2 are the sample sizes. This calculated F value is compared with a Tabled F Value at the five percent significance level. The null hypothesis is rejected if the calculated F is greater than the Tabled F and leads to the conclusion that the sample variances are unequal. If the observed F is less than the tabled F, then we fail to reject the null hypothesis.

T Statistic

The T test is used to test for hypothesis on the means, when the distribution of the variable and its mean are unknown but its variance is known. In this study the test determines whether the two surveys can be combined into one larger elevator sample and one larger grain producer sample. The test is based on the null hypothesis that no significant difference exists between the means of the two samples.

The test (calculated t) statistic for testing the equality of means from two unequal sized (n_1 and n_2) independent samples when the variances are equal is:

$$t = (\bar{X}_1 - \bar{X}_2) / \sqrt{s^2\ (1/n_1 + 1/n_2)} \qquad (2)$$

This test statistic includes a term for the pooled variance S^2 where:

$$S^2 = ([n_1 - 1]S_1^2 + [n_2 - 1]S_2^2)/(n_1 + n_2 - 2) \quad (3)$$

and S_1^2 and S_2^2 are the variances of the two samples. The degrees of freedom for samples with equal variances is $(n_1 + n_2 - 2)$. This calculated t is then compared with the tabulated t at the five percent significance level with the given degrees of freedom. The null hypothesis is rejected if the calculated t is more than the tabulated t.

The test statistic for testing the equality of means from two independent samples (with n_1 and n_2 absenting) when the variances are unequal is:

$$t = (\bar{X}_1 - \bar{X}_2)/ (S_1^2/ n_1 + S_2^2/n_2) \quad (4)$$

This statistic does not follow a student's t-distribution. Since the tabulated t value ordinarily assumes that population variances are equal, the t value for unequal variances requires a special table. According to Satterthwaite, the ordinary t table may be used but with the following approximation for degrees of freedom (df):

$$df = \frac{(S_1^2/ n_1 + S_2^2/n_2)^2}{(S_1^2/n_1)^2/(n_1 - 1) + (S_2^2/n_2)^2/(n_2 - 1)} \quad (5)$$

This approximation, which is also used by SAS, assigns an approximate number of degrees of freedom to this t.

Once the calculated t value has been derived, it is compared with the tabulated t value at the five percent significance level with the

degrees of freedom determined by Satterthwaite's formula. If the calculated t is more than the tabulated t, the null hypothesis is rejected.

Combining the Elevator Surveys

Sixty two people responded to the officer's and director's survey and 118 responded to the warehouse managers survey. Some general inconsistencies exist between the two surveys. Officers and Directors of the state grain and feed associations are generally the more active participants in the grain industry. Due to their relatively higher position than the warehouse managers, they may have had more education, be better informed or had access to more technically advanced systems. This may cause their response to be different from those of the warehouse managers.

There is one operational characteristic in the officer's and director's questionnaire which was not explained in the warehouse manager's questionnaire. The question asks the respondents to rate the degree of importance attached by them to buying grain which is described by an independent third party. The responses will be discussed in detail in later sections of this study.

Combining both the elevator surveys is based on the decision rule that 80 percent of the calculated t values for the questions analyzed are considered insignificant (at the five percent significance level). Forty five questions common to both surveys and their responses were analyzed for differences in mean responses. Out of these statistically different mean responses were observed in only two questions. On ability to change bid or offer prices as frequently as they wished the officers and directors had a mean response rate of 3.32 while the

elevator managers had a mean response rate of 3.80. The t value was 2.324 with a prob >|T| of 0.0214. On improved access to summaries of all sales and purchases the officers and directors had a mean response rate of 3.29 while the elevator managers mean response rate was 3.63. The t value was 2.113 with a prob >|T| of 0.0362.

Since more than 80 percent of the questions had no statistically significant differences in mean responses, the two elevator surveys were combined into a single larger sample.

Combining the Producer Surveys

One hundred and fifty grain producers were interviewed personally under one survey and 144 grain producers responded to the shorter mail out questionnaire. Inconsistencies between the two producer surveys may lead to biased results. Some questions, though intended to mean the same, are worded differently. For example, "offer grain at a set price and wait until a buyer bids that amount" (question 4a of Producer Mail Out Questionnaire in Appendix C) is worded as "producers could offer their grain at a set price and wait until a buyer bid that amount" (question 4a of section IV of Producer Personal Interview Questionnaire in Appendix D). This study assumes these questions are the same, but bias may result.

Another potential source of bias is the method of survey, that is, one survey was conducted by personal interview the other was a mail out questionnaire. Moreover three interviewers conducted the personal interview. Two were female and one was male. Differences in interviewer personalities and communication skills may have influenced the producers in interpreting the questions differently. The personal

interview being longer than the mail out survey may also cause some inconsistency. The personal interview was restricted to grain producers from the top grain producing counties of each state, while the mail out survey was a sample of randomly selected grain producers throughout the western states.

Respondents to the producer personal interview questionnaire were asked to respond on a 1 to 99 scale, while a 1 to 5 scale was used in the mail out survey.

But both the scales must be the same before conducting a test for differences in means. So the 1 to 99 scale used in the personal interview survey was converted to a 1 to 5 scale using the following method:

1-20 = 1 = NOT IMPORTANT;

21-40 = 2 = LESS THAN MODERATELY IMPORTANT;

41-60 = 3 = MODERATELY IMPORTANT;

61-80 = 4 = GREATER THAN MODERATELY IMPORTANT; AND

81-99 = 5 = HIGHLY IMPORTANT.

In making this transformation, interval level data is assumed. It was decided feasible to combine both the surveys if 80 percent or more of the questions do not show significant differences in means. There were 50 questions relevant to both the producer surveys. The t-test revealed that eight questions had significantly different responses from the two surveys (Table III). On forward contracting grain at a set price and waiting until a buyer bids that amount, personal interview respondents had a mean response of 3.84 while mail out survey respondents gave a 3.54 mean response. Personal interview respondents gave a 3.56 mean response from mail out survey respondents on ability

TABLE III

CHARACTERISTICS WHICH REVEALED SIGNIFICANTLY DIFFERENT RESPONSES FROM PRODUCER PERSONAL INTERVIEW RESPONDENTS AND PRODUCER MAIL OUT QUESTIONNAIRE RESPONDENTS

	Mean Response		Standard Deviation				
	1*	2**	1*	2**	Variances	T Value	Prob >|T|
1. Offer grain at a set price and wait until a buyer bids that amount	3.53	3.85	1.08	1.21	EQUAL	-2.3508	0.0194
2. Forward contract grain at a set price and wait until a buyer bids that amount	3.54	3.84	1.08	1.16	EQUAL	-2.2458	0.0255
3. Place futures market orders	3.20	3.56	1.16	1.13	EQUAL	-2.6629	0.0082
4. Protein	3.06	3.53	1.19	1.28	EQUAL	-3.1732	0.0017
5. Access the system from home	3.72	4.10	1.11	1.04	EQUAL	-2.9858	0.0031
6. Access the system from a local agribusiness	3.43	3.79	1.11	1.18	EQUAL	-2.6317	0.0090
7. Send and receive electronic mail	2.88	3.27	1.13	1.41	UNEQUAL	-2.4893	0.0134
8. Use the computer for other consumer services (catalog shopping, airline reservations, etc.)	2.35	2.85	1.15	1.49	UNEQUAL	-3.1395	0.0019

*Producer Mail Out Survey

**Producer Personal Interview

to place futures market orders. Mean response on the importance of protein as a descriptive characteristic was 3.53 for personal interview respondents and 3.06 for mail out survey respondents. Accessing the electronic marketing system from home had a mean response of 4.10 from personal interview respondents and 3.72 from mail out survey respondents. Similar differences were observed on mean responses to accessing the system from a local agribusiness - 3.79 and 3.43. Sending and receiving electronic mail had a mean response of 3.27 from personal interview respondents and 2.88 from those who answered the mail out questionnaire. Using the computer for other consumer services like catalog shopping, air line reservations etc. had a mean response of 2.85 from personal interview respondents and 2.35 from mail out survey respondents.

Producers, grain elevator management and feedlot operators were asked questions pertaining to the size and nature of their business operations, the crops they grow or handled, the relative importance they attached to various pricing, information, descriptive, storage and transportation, operational and functional characteristics of a grain electronic market. The feedlot operator's questionnaire was a shorter version with questions on descriptive and functional characteristics only.

Chi-Square Analysis

The chi-square test can be used as a quantitative test of the difference between the observed frequency (f_i) and the expected frequency (F_i) in a comparison. Normality is not assumed and the null hypothesis is: no significant difference exists between an observed set

of frequencies and a theoretically expected set of frequencies.

In this analysis, ηx 5 contingency tables are used to test varied hypotheses of association using the chi square statistic. A contingency table shows the relationship between two characteristics. In this study, η may be size of operation (small, medium and large), type of organization (cooperative and independent), and crop grown or handled (corn, wheat and soybeans). The 5 columns represent responses to a specific question. The formula for the chi-square statistic is:

$$\text{chi-square} = \sum_{i=1}^{K} \frac{(f_i - F_i)}{F_i}$$

where f_i = observed frequency

F_i = expected frequency

K = number of cells.

The degrees of freedom are (R - 1) (C - 1), where R and C are the numbers of rows and columns, respectively.

The responses will now be analyzed in the new combined form as:

1. The Elevator questionnaires;
2. The Grain Producer questionnaires, and
3. The Feedlot questionnaires.

Chi square (x^2) and observed significance levels of .05 will be used throughout this study (Appendix F). Previous literature on x^2 analysis suggests that in order to obtain a valid x^2 estimate the expected frequency in each cell must be equal to at least five where expected frequency for the ith cell equals:

$$E_i = \frac{R_i \times C_i}{N} \tag{7}$$

such that:

A	B	R_1
C	D	R_2
C_1	C_2	N

The test statistic is computed by:

$$X_i^2 = \left[\frac{(f_i)\ (E_i)}{E_i} \right]^2 \tag{8}$$

where f_i = observed frequency.

However, recent literature suggests that an expected frequency of two is sufficient for a valid x^2 (Roscoe and Byars, Cochran).

Categories

All surveys are concerned with identifying the surveyee, the nature and size of his operation, and the crops grown or handled. Grain elevators were asked questions on their storage capacity, areas in which they operated, number of producers they bought grain from and sold grain to, and their grain buying, handling and delivery procedures. Grain producers were to furnish information on the numbers of acres owned, rented, leased, and operated by them in 1982, their on-farm grain

storage capacity, land distributed among various crops and their selling and delivery methods. One of the objectives of this study is to determine, if any, differences of opinion exist within producers, within the elevator management and within the feedlot operators. Their responses were analyzed across groups based on type of organization, size of operation during 1982 and crops handled or planted in 1982.

Based on the type of organization, elevators were divided into cooperative (68 elevators) and independent (107 elevators). On number of bushels of grain handled during 1982, they were grouped as Small (up to one million bushels), Medium (one to five million bushels), and Large (over five million bushels). This resulted in 73 small, 76 medium and 20 large elevators. Grouping on crop handled produced 111 responses for corn, 75 for soybeans and 126 for wheat. These responses together are more than the number of respondents (180) because each elevator handles more than one crop in most cases.

The producers were grouped by size and crops grown. Analysis by number of acres planted in 1982 resulted in small (up to 400 acres), medium (401-800 acres) and large (over 800 acres) classifications. This resulted in 76 small, 87 medium and 127 large sized producers. For the 294 grain producers who responded to the surveys, 169 responses raised corn, 227 raised soybeans and 133 raised wheat. Again, the total is due to one producer growing more than one of the above crops in 1982.

The feedlot operators were grouped into small (5,000 - 10,000 head), medium (10,000 - 30,000 head) and large (over 30,000 head), based on their on-time feedlot capacity. There were 33 small, 31 medium and 14 large feedlots responding.

CHAPTER III

ANALYSIS AND RESULTS

Pricing Characteristics

Elevator Management Responses

Several potential pricing characteristics could affect the attitudes of potential users towards a grain electronic marketing system. Elevator managers were asked to indicate the degree of importance attached by them towards expanded information about the quantities of grain offered by sellers at specified prices. The response mean was 3.32 with a standard deviation of 1.20 (Table IV). Out of 170 respondents, 46 percent felt the characteristic was greater than moderately to highly important, and 33.5 percent felt the characteristic was moderately important. Using Chi-Square analysis there was no statistically significant differences in responses among elevator management across size of operation, type of organization and crop handled at the 5 percent level. Some elevators want to be able to bid on the grain based on producers' asking prices. The response mean to this characteristic was 3.13 and the standard deviation 1.22. Nearly 38 percent of the respondents gave a positive response and 34.7 percent gave a neutral response. Elevator managers viewed an expanded sales area as being slightly more important than an expanded procurement area. The response means were 3.40 and 3.19, respectively. The number of

TABLE IV

ELEVATOR OPERATOR RESPONSES TOWARD POTENTIAL PRICING CHARACTERISTICS OF A GRAIN ELECTRONIC MARKET

Potential Pricing Characteristics	Number of Observations	Mean	Standard Deviation	Responses - Frequency (Row Percent)				
				Not Important	Less Than Moderately Important	Moderately Important	Greater Than Moderately Important	Highly Important
1. Expanded information on quantities of grains offered at specified prices	170	3.32	1.20	19 (11.2)	16 (9.4)	57 (33.5)	48 (28.3)	30 (17.7)
2. Ability to bid on grain based on producer's asking prices	170	3.13	1.22	21 (12.4)	26 (15.3)	59 (34.7)	38 (22.4)	26 (15.3)
3. Expanded procurement area for grain	169	3.19	1.19	18 (10.7)	25 (14.8)	59 (34.9)	41 (24.3)	26 (15.4)
4. Expanded sales area	167	3.40	1.25	18 (10.8)	15 (9.0)	57 (34.1)	36 (21.6)	41 (24.5)
5. Ability to participate in periodic grain auctions	168	2.44	1.13	41 (24.4)	48 (28.6)	52 (30.9)	18 (10.7)	9 (5.4)
6. Ability to change bid or offer prices as frequently as you wish	170	3.61	1.28	16 (9.4)	16 (9.4)	42 (24.7)	41 (24.1)	55 (32.4)

(Source: Survey Data [Appendix A and Appendix B])

elevator managers with a positive response was 46 percent and 40 percent respectively. Finding more buyers to sell grain to may be more difficult than finding additional producers to buy grain from. Also, available storage may limit the number of producers from which an elevator can purchase grain. Ability to participate in periodic grain auction had a response mean of 2.44 with a standard deviation of 1.13. Only 16.1 percent of the elevator respondents considered this characteristic as being highly important. Ability to change bid or offer prices as frequently as the users' wished gives them more flexibility and does not trap them during sudden changes in the market. This potential characteristic had a response mean of 3.61 with a standard deviation of 1.28. Fifty-six and one-half percent of the respondents had a positive response and 25 percent had a neutral response.

Grain Producer Responses

Grain producers were asked to respond to slightly different pricing characteristics since they act primarily as sellers, whereas grain elevators perform both buyer and seller roles. The responses of grain producers with summary statistics are given in Table V. Offering grain at a set price and waiting until a buyer bids that amount, and forward contracting grain at a set price and waiting until a buyer bids that amount were two pricing characteristics considered important by grain producers. The response mean for each of these characteristics was 3.70 and the standard deviations were 1.16 and 1.13, respectively. Having grain auctioned to the highest bidder was moderately important to the average producer. The response mean was 2.94 and the standard

TABLE V

GRAIN PRODUCER RESPONSES TOWARD POTENTIAL PRICING CHARACTERISTICS OF A GRAIN ELECTRONIC MARKET

Potential Pricing Characteristics	Number of Observations	Mean	Standard Deviation	Responses - Frequency (Row Percent)				
				Not Important	Less Than Moderately Important	Moderately Important	Greater Than Moderately Important	Highly Important
1. Offer grain at a set price and wait until a buyer bids that amount	285	3.70	1.16	19 (6.7)	18 (6.3)	79 (27.7)	84 (29.5)	85 (29.8)
2. Forward contract grain at a set price and wait until a buyer bids that amount	284	3.70	1.13	18 (6.3)	16 (5.6)	78 (27.5)	92 (32.4)	80 (28.2)
3. Have Grain auctioned to highest bidder	286	2.94	1.35	56 (19.6)	52 (18.2)	80 (28.0)	49 (17.1)	49 (17.1)
4. Place a reservation or floor price (unknown to buyers) on your grain	286	3.50	1.19	26 (9.1)	21 (7.3)	88 (30.8)	85 (29.8)	66 (23.1)
5. Change reservation or floor price as frequently as you wish	287	3.69	1.26	24 (8.4)	23 (8.0)	71 (24.8)	69 (24.0)	100 (34.8)
6. Place futures market orders	283	3.38	1.16	23 (8.1)	36 (12.7)	85 (30.0)	88 (31.1)	51 (18.0)
7. Offer grain to more buyers	288	4.17	1.01	11 (3.8)	3 (1.0)	51 (17.7)	83 (28.8)	140 (48.6)

(Source: Survey Data [Appendix C and Appendix D])

deviation 1.35. Over thirty-four percent of the respondents had a positive response and 37.8 percent had a negative response. Electronic marketing could enable grain producers to place a reservation or floor price on their grain unknown to buyers. This characteristic yielded a response mean of 3.50 with a standard deviation of 1.19. Changing this reservation or floor price as frequently as they wished drew a response mean of 3.69 and a standard deviation of 1.26. The importance of placing futures market orders over an electronic system was also asked of producers. The response mean was 3.38, indicating that this characteristic was moderately important to greater than moderately important. About half (49.1 percent) of the respondents gave a positive response to this characteristic. Thus offering grain to more buyers produced a response mean of 4.17 and a standard deviation of 1.01. Over seventy seven percent of the respondents gave a positive response to this characteristic and was the most important potential pricing characteristic indicated. It can be concluded that producers would like to have more potential outlets for their grain.

Information Services

Fast and accurate information on prices, weather, and market trends is needed by every trader to function and compete effectively in today's grain markets. Both buyer and sellers would like to keep abreast of the market and be more informed. Electronic marketing may improve the quantity and quality of information currently available to most producers and many elevators.

Regarding potential information services, the summary statistics for elevator manager responses are given in Table VI and for producers

TABLE VI

ELEVATOR OPERATOR RESPONSES TOWARD POTENTIAL INFORMATION SERVICES OF A GRAIN ELECTRONIC MARKET

Potential Information Services	Number of Observations	Mean	Standard Deviation	Responses - Frequency (Row Percent)				
				Not Important	Less Than Moderately Important	Moderately Important	Greater Than Moderately Important	Highly Important
1. Improved access to details of current trades	168	3.55	1.08	6 (3.6)	19 (11.3)	60 (35.7)	43 (25.6)	40 (23.8)
2. Improved access to summaries of all trades	169	3.50	0.98	6 (3.6)	12 (7.1)	72 (42.6)	50 (29.5)	29 (17.1)
3. Improved access to forward contract offers from producers	166	3.40	1.04	9 (5.4)	20 (12.1)	57 (34.3)	57 (34.3)	23 (13.9)
4. Improved access to information on available storage facilities	167	2.79	1.09	25 (14.9)	36 (21.6)	68 (40.7)	27 (16.2)	11 (6.6)
5. Currency exchange rates	164	2.48	1.15	42 (25.6)	40 (24.4)	52 (31.7)	22 (13.4)	8 (4.9)
6. News - General	161	3.03	1.01	13 (8.1)	28 (17.4)	75 (46.6)	32 (19.9)	13 (8.1)
7. News - Commodity	165	3.73	1.04	6 (3.6)	11 (6.7)	48 (29.1)	57 (34.6)	43 (26.0)
8. Local Prices	169	3.83	1.03	5 (3.0)	11 (6.5)	43 (25.4)	58 (34.3)	52 (30.8)

Table VI (Continued)

Potential Information Services	Number of Observations	Mean	Standard Deviation	Responses - Frequency (Row Percent)				
				Not Important	Less Than Moderately Important	Moderately Important	Greater Than Moderately Important	Highly Important
9. National Prices	166	3.51	1.01	5 (3.0)	18 (10.8)	60 (36.1)	53 (31.9)	30 (18.1)
10. World Prices	164	3.34	1.04	6 (3.7)	26 (15.9)	64 (39.0)	42 (25.6)	26 (15.8)
11. Futures Prices	167	3.99	1.06	5 (3.0)	9 (5.4)	38 (22.7)	46 (27.6)	69 (41.3)
12. Forecast Prices	164	3.77	0.99	5 (3.0)	8 (4.9)	49 (29.9)	60 (36.6)	62 (25.6)
13. Trade Leads	165	3.26	1.19	16 (9.7)	24 (14.6)	55 (33.3)	42 (25.5)	28 (16.9)
14. Transportation Rates	169	3.57	1.15	12 (7.1)	16 (9.5)	44 (26.1)	58 (34.3)	39 (23.1)
15. USDA Reports	169	3.61	1.15	10 (5.9)	12 (7.1)	62 (36.7)	37 (21.9)	48 (28.4)
16. Local Weather	168	3.35	1.13	15 (8.9)	16 (9.5)	59 (35.1)	51 (30.4)	27 (16.1)
17. National Weather	165	3.45	1.10	9 (5.5)	19 (11.5)	58 (35.2)	47 (28.5)	32 (19.3)
18. World Weather	161	3.19	1.09	14 (8.8)	22 (13.6)	63 (39.1)	43 (26.7)	19 (11.8)

(Source: Survey Data [Appendix A and Appendix B])

are given in Table VII. The electronic system could provide users improved access to details of current trades. When asked the importance of this potential information service, elevators had a mean response of 3.55 (standard deviation 1.08) and grain producers had a response mean of 3.84 (standard deviation 1.09). The elevator manager responses showed statistically significant differences (at the 5 percent level) on this characteristic when analyzed by size of operation (Table VIII).

The electronic system could offer its users improved access to summaries of all trades. This characteristic had a response mean of 3.50 from elevator managers and a standard deviation of 0.98. This compares to a producer response mean of 3.89 and a standard deviation of 1.00. Responses on improved access to forward contract offers from producers and bids from buyers were analyzed. The elevator management response mean was 3.40 and the producer response mean was 4.09. Over forty eight percent of elevator managers and 75.5 percent of grain producers gave a positive response to this characteristic. In addition, grain producers had a response mean of 4.22 to improved access to cash price bids from buyers. Two hundred thirty-five (80.7 percent) of the responding grain producers saw this characteristic as being greater than moderately important to highly important. Elevator managers were asked to rate their importance on information on available storage facilities. This characteristic had a response mean of 2.79 and standard deviation 1.09. Less than 23 percent of the respondents gave a positive response.

Grain electronic markets could provide users with other market information. For example, it could provide currency exchange rates of major countries who are active participants in international grain markets. The elevator response mean was 2.48 (standard deviation 1.15)

TABLE VII

GRAIN PRODUCER RESPONSES TOWARD POTENTIAL INFORMATION SERVICES OF A GRAIN ELECTRONIC MARKET

Potential Information Services	Number of Observations	Mean	Standard Deviation	Responses - Frequency (Row Percent)				
				Not Important	Less Than Moderately Important	Moderately Important	Greater Than Moderately Important	Highly Important
1. Improved access to details of most recent individual trades	291	3.84	1.09	15 (5.2)	10 (3.4)	78 (26.8)	91 (31.3)	97 (33.3)
2. Improved access to summaries of all trades	291	3.89	1.00	9 (3.1)	11 (3.8)	79 (27.2)	100 (34.4)	92 (31.6)
3. Improved access to cash price bids from buyers	291	4.22	0.91	6 (2.1)	4 (1.4)	46 (15.8)	100 (34.4)	135 (46.3)
4. Improved access to forward contract bids from buyers	289	4.09	0.96	7 (2.4)	7 (2.4)	57 (19.7)	99 (34.3)	119 (41.2)
5. Currency exchange rates*	150	3.29	1.31	22 (14.7)	17 (11.3)	37 (24.7)	44 (29.3)	30 (20.0)
6. General News	289	3.37	1.08	18 (6.2)	32 (11.1)	113 (39.1)	77 (26.6)	49 (17.0)
7. Commodity News	287	4.00	0.93	6 (2.1)	10 (3.5)	60 (20.9)	116 (40.4)	95 (33.1)
8. Local Prices	291	4.13	1.00	7 (2.4)	13 (4.4)	47 (16.2)	93 (32.0)	131 (45.0)

Table VII (Continued)

Potential Information Services	Number of Observations	Mean	Standard Deviation	Responses - Frequency (Row Percent)				
				Not Important	Less Than Moderately Important	Moderately Important	Greater Than Moderately Important	Highly Important
9. National Prices	290	3.95	1.05	8 (2.8)	18 (6.2)	66 (22.7)	91 (31.4)	107 (36.9)
10. World Prices	289	3.90	1.03	8 (2.8)	16 (5.5)	75 (26.0)	94 (32.5)	96 (33.2)
11. Futures Prices	287	4.07	0.99	7 (2.4)	12 (4.2)	50 (17.4)	104 (36.2)	114 (39.7)
12. Forecast Prices	286	3.82	1.11	13 (4.5)	22 (7.7)	62 (21.7)	97 (33.9)	92 (32.2)
13. Trade Leads*	149	3.64	1.23	13 (8.7)	12 (8.1)	33 (22.2)	48 (32.2)	43 (28.8)
14. Transportation Rates	289	3.47	1.21	24 (8.3)	31 (10.7)	89 (30.8)	75 (25.9)	70 (24.2)
15. USDA Reports	287	3.40	1.25	33 (11.5)	25 (8.7)	86 (30.0)	80 (27.9)	63 (21.9)
16. Weather**	139	3.78	1.08	6 (4.3)	6 (4.3)	45 (32.4)	38 (27.3)	44 (31.7)
17. Local Weather*	150	3.69	1.18	10 (6.7)	13 (8.7)	35 (23.3)	47 (31.3)	45 (30.0)
18. National Weather*	150	3.72	1.09	8 (5.3)	9 (6.0)	41 (27.3)	51 (34.0)	41 (27.3)
19. World Weather*	147	3.48	1.20	14 (9.5)	12 (8.2)	44 (29.9)	44 (29.9)	33 (22.5)

(Source: Survey Data [Appendix C and Appendix D])

*Producer Personal Interview Survey Only

**Producer Mailed Survey Only

TABLE VIII

ELEVATOR OPERATOR RESPONSES BY SIZE ON IMPROVED ACCESS TO DETAILS OF RECENT SALES OR PURCHASES

	Responses - Frequency (Row Percent)					
Size	Not Important	Less Than Moderately Important	Moderately Important	Greater Than Moderately Important	Highly Important	Total
Small	3 (1.9)	4 (2.5)	26 (16.5)	19 (12.0)	17 (10.8)	69 (43.7)
Medium	0 (0.0)	8 (5.1)	27 (17.1)	18 (11.4)	17 (10.8)	70 (44.3)
Large	3 (1.9)	4 (2.5)	4 (2.5)	3 (1.9)	5 (3.2)	19 (12.0)
Total	6 (3.8)	16 (10.1)	57 (36.1)	40 (25.3)	39 (24.8)	158 (100)

Chi square = 15.746 DF = 8 Observed significance level 0.0462

(Source: Survey data [Appendix A and Appendix B])

and the producer response mean 3.29 (standard deviation 1.31). The low elevator response mean may have been due to the fact that only two elevators were directly involved in grain exporting. The elevator managers had a response mean of 3.03 and the producers had a response ean of 3.37 towards general news. Commodity news was viewed as being more important, the response mean for elevators and producers being 3.73 and 4.00, respectively.

The responses of elevator managers and producers toward local, national, world, futures and forecast prices are summarized in Table IX. Producers displayed a trend of attaching more importance to information on prices compared to elevators. Elevator managers probably have more access to price information currently than producers. Prices at the local level and futures prices were considered relatively more important by both elevator managers and producers. World prices were considered less important compared to other types of prices by both producers and elevators. Again, few respondents were actively or directly involved in the export market. However, both elevator managers and grain producers appear aware of the importance of world grain markets and prices. Trade leads drew a response mean of 3.26 from elevators and 3.64 from grain producers. This characteristic was not included in the producer mail questionnaire. Elevators viewed transportation rates as more important (response mean 3.57) when compared with the responses of producers (response mean 3.47). This may have been due to producers having more localized operations compared to grain elevators. Producer responses, when analyzed by size (acres planted in 1982) gave a Chi-Square of 20.400 (Table X). More small sized producers attached a greater importance on transportation rates (68.5 percent had a positive

TABLE IX

ELEVATOR OPERATOR AND GRAIN PRODUCER RESPONSES TOWARD INFORMATION ON VARIOUS TYPES OF PRICES (PERCENTAGE)

	Elevators (166)			Producers (289)		
	Negative	Neutral	Positive	Negative	Neutral	Positive
Local Prices	9.5	25.4	65.1	6.9	16.1	77.0
National Prices	13.9	36.1	50.0	9.0	22.3	68.2
World Prices	19.5	39.0	41.5	8.3	26.0	65.7
Futures Prices	8.4	22.8	68.9	6.6	17.4	76.0
Forecast Prices	7.9	29.9	62.2	12.2	21.7	66.1

(Source: Survey Data [Appendixes A, B, C and D])

TABLE X

GRAIN PRODUCER RESPONSES BY SIZE OF OPERATION TOWARD INFORMATION ON TRANSPORTATION RATES

	Responses - Frequency (Row Percent)					
Size	Not Important	Less Than Moderately Important	Moderately Important	Greater Than Moderately Important	Highly Important	Total
Small	4 (1.4)	4 (1.4)	15 (5.2)	25 (8.8)	25 (8.8)	73 (25.6)
Medium	8 (2.8)	8 (2.8)	34 (11.9)	25 (8.8)	12 (4.2)	87 (30.5)
Large	11 (3.9)	18 (6.3)	39 (13.7)	24 (8.4)	33 (11.6)	125 (43.9)
Total	23 (8.1)	30 (10.5)	88 (30.8)	74 (26.0)	70 (24.6)	285 (100)

Chi square = 20.400 DF = 8 Observed significance level = 0.0089

(Source: Survey data [Appendix C and Appendix D])

response), followed by large sized producers (45.6 percent had a positive response) and medium producers (42.5 percent had a positive response). USDA reports were considered more important by elevators (response mean 3.61) than did producers (response mean 3.40).

Weather was given as a single composite characteristic in the producer mail out survey but was divided into local, national and world weather in the producer personal interview survey and both the elevator surveys. Respondents to the producer mail out survey gave an average response of 3.78 to weather, attaching a moderate importance to greater than moderate importance. The response means for local, national and world weather were 3.35, 3.45 and 3.19 for elevators and 3.69, 3.72 and 3.48 for producers, respectively. Both elevator management and producers may have not attached more importance to local weather information since much is already available through local radio and television broadcasts. National weather reports may have been more difficult to obtain. Weather patterns in other countries do affect crop production in those countries and thus affect exports. This information may not be of direct immediate benefit to elevator managers and grain producers.

Descriptive Characteristics

Accurate and meaningful product description is essential for remote trading. Grains may have an advantage over many agricultural commodities in that they generally have widely accepted grades and standards. Grain is often sold on some base grade and standard. If these are not met, discounts are applied. There are various descriptions used to denote the quantity and quality of grain offered

for sale. All essential descriptions should be used to minimize misunderstandings and conflict among traders. Capability of the system to facilitate accurate and timely communication between potential users should be one of the keys to building user confidence and success of the system. Descriptive characteristics are included in all the surveys including the feedlot operators' survey. The responses of elevator managers, producers and feedlot operators with summary statistics are given in Tables XI, XII and XIII, respectively.

Location of the commodity was the most important description. The response means for elevator managers, producers and feedlot operators were 3.86, 3.94 and 4.29 respectively. Sixty six point four percent of the elevators, 67.7 percent of producers and 76 percent of feedlot operators gave a positive response. Delivery conditions yielded a response mean of 3.87, 3.92 and 4.55 from the three groups. Quantity of grain offered for sale had similar responses from all the three groups. The average response mean ranged from 3.94 to 3.96 with the standard deviation ranging from 1.02 to 1.10. Some of the other descriptive characteristics considered important were moisture content, U.S. grade, protein and percent oil. Response means for these were generally highest for feedlot operators followed by grain producers and by elevator managers. Oil content was more important to grain producers (response mean 3.26) than to the elevator management (response mean 2.54). Heat damage had response means of 3.45, 3.62 and 4.62 from elevators, grain producers and feedlot operators respectively. Among feedlot operators none of the responses were negative and 90.4 percent said it was greater than moderately important to highly important. Total damage drew similar responses. The remaining descriptive

TABLE XI

ELEVATOR OPERATOR RESPONSES TOWARD POTENTIAL DESRCIPTIVE CHARACTERISTICS OF A GRAIN ELECTRONIC MARKET

Potential Descriptive Characteristics	Number of Observations	Mean	Standard Deviation	Responses - Frequency (percent)				
				Not Important	Less Than Moderately Important	Moderately Important	Greater Than Moderately Important	Highly Important
1. Location (FOB)	170	3.86	1.12	9 (5.3)	9 (5.3)	39 (22.9)	53 (31.2)	60 (35.2)
2. Delivery conditions	171	3.87	1.01	4 (2.3)	9 (5.3)	48 (28.1)	54 (31.6)	56 (32.7)
3. Quantity offered	170	3.94	1.09	6 (3.5)	9 (5.3)	44 (25.9)	42 (24.7)	69 (40.6)
4. Moisture	169	3.78	1.09	6 (3.5)	13 (7.7)	48 (28.4)	47 (27.8)	55 (32.5)
5. U.S. Grade	169	3.89	1.10	6 (3.5)	10 (5.9)	45 (26.6)	43 (25.4)	65 (38.5)
6. Protein	166	3.33	1.29	17 (10.2)	25 (15.1)	52 (31.3)	30 (18.1)	42 (25.3)
7. Percent Oil	161	2.54	1.33	47 (29.2)	36 (22.4)	40 (24.8)	20 (12.4)	18 (11.2)
8. Heat Damage	166	3.45	1.20	10 (6.0)	29 (17.5)	43 (25.9)	45 (27.1)	39 (23.5)

Table XI (Continued)

Potential Descriptive Characteristics	Number of Observations	Mean	Standard Deviation	Responses - Frequency (percent)				
				Not Important	Less Than Moderately Important	Moderately Important	Greater Than Moderately Important	Highly Important
9. Total Damage	166	3.59	1.16	7 (4.2)	24 (14.5)	44 (26.5)	46 (27.7)	45 (27.1)
10. Broken Kernels	165	3.51	1.16	8 (4.8)	25 (15.2)	48 (29.1)	43 (26.1)	41 (24.9)
11. Test Weight	167	3.73	1.12	6 (3.6)	17 (10.2)	45 (27.0)	48 (28.7)	51 (30.5)
12. Foreign Material	109	3.67	1.15	4 (3.7)	15 (13.7)	26 (23.8)	32 (29.4)	32 (29.4)
13. Defects	161	3.48	1.15	9 (5.6)	22 (13.7)	50 (31.1)	43 (26.7)	37 (22.9)
14. DHV	146	3.21	1.27	19 (13.0)	21 (14.4)	44 (30.1)	35 (24.0)	27 (18.5)

(Source: Survey Data [Appendix A and Appendix B])

TABLE XII

GRAIN PRODUCER RESPONSES TOWARD POTENTIAL DESCRIPTIVE CHARACTERISTICS OF A GRAIN ELECTRONIC MARKET

Potential Descriptive Characteristics	Number of Observations	Mean	Standard Deviation	Responses - Frequency (percent)				
				Not Important	Less Than Moderately Important	Moderately Important	Greater Than Moderately Important	Highly Important
1. Location (FOB)	291	3.94	1.08	13 (4.5)	10 (3.4)	71 (24.4)	85 (29.2)	112 (38.5)
2. Delivery conditions	291	3.92	1.02	11 (3.8)	8 (2.8)	74 (25.4)	97 (33.3)	101 (34.7)
3. Quantity	289	3.93	1.10	12 (4.2)	13 (4.5)	72 (24.9)	77 (26.6)	115 (39.8)
4. Moisture	290	3.95	1.05	8 (2.8)	15 (5.2)	74 (25.5)	79 (27.2)	114 (39.3)
5. U.S. Grade	290	3.95	1.04	8 (2.8)	13 (4.5)	78 (26.9)	77 (26.5)	114 (39.3)
6. Protein	287	3.32	1.25	30 (10.4)	37 (12.9)	96 (33.4)	60 (20.9)	64 (22.3)
7. Percent Oil(Soybeans)	239	3.26	1.22	28 (11.7)	23 (9.6)	93 (38.9)	49 (20.5)	46 (19.3)
8. Heat Damage	285	3.62	1.17	22 (7.7)	20 (7.0)	77 (27.0)	90 (31.6)	76 (26.7)

Table XII (Continued)

Potential Descriptive Characteristics	Number of Observations	Mean	Standard Deviation	Responses - Frequency (percent)				
				Not Important	Less Than Moderately Important	Moderately Important	Greater Than Moderately Important	Highly Important
9. Total Damage	289	3.81	1.11	13 (4.5)	21 (7.3)	71 (24.6)	88 (30.4)	96 (33.2)
10. Broken Kernels	287	3.41	1.21	27 (9.4)	31 (10.8)	90 (31.4)	75 (26.1)	64 (22.3)
11. Test Weight	290	3.74	1.11	11 (3.8)	28 (9.6)	76 (26.3)	87 (30.0)	88 (30.3)
12. Foreign Material	289	3.72	1.11	11 (3.8)	26 (9.0)	83 (28.7)	81 (28.0)	88 (30.5)
13. Defects	276	3.54	1.19	22 (8.0)	25 (9.1)	78 (28.2)	83 (30.1)	68 (24.6)
14. DHV	159	3.30	1.20	18 (11.3)	14 (8.8)	58 (36.5)	40 (25.2)	29 (18.2)

(Source: Survey Data [Appendix C and Appendix D])

TABLE XIII

FEEDLOT OPERATOR RESPONSES TOWARD POTENTIAL DESCRIPTIVE CHARACTERISTICS OF A GRAIN ELECTRONIC MARKET

Potential Descriptive Characteristics	Number of Observations	Mean	Standard Deviation	Responses - Frequency (percent)				
				Not Important	Less Than Moderately Important	Moderately Important	Greater Than Moderately Important	Highly Important
1. Location (FOB)	75	4.29	1.14	4 (5.3)	1 (1.3)	13 (17.3)	8 (10.7)	49 (65.4)
2. Delivery conditions	75	4.55	0.68	0 (0.0)	0 (0.0)	8 (10.7)	18 (24.0)	49 (65.3)
3. Quantity	75	3.96	1.02	1 (1.3)	4 (5.3)	22 (29.3)	18 (24.0)	30 (40.0)
4. Moisture	73	4.37	0.95	1 (1.4)	2 (2.7)	12 (16.4)	12 (16.4)	46 (63.0)
5. U.S. Grade	75	4.21	0.89	0 (0.0)	3 (4.0)	14 (18.7)	22 (29.3)	36 (48.0)
6. Protein	74	3.72	1.12	4 (5.4)	4 (5.4)	23 (31.1)	21 (28.4)	22 (29.7)
7. Time in Storage	75	3.64	1.09	2 (2.7)	10 (3.3)	20 (26.7)	24 (32.0)	19 (25.3)
8. Heat Damage	73	4.62	0.66	0 (0.0)	0 (0.0)	7 (9.6)	14 (19.2)	52 (71.2)

Table XIII (Continued)

Potential Descriptive Characteristics	Number of Observations	Mean	Standard Deviation	Responses - Frequency (percent)				
				Not Important	Less Than Moderately Important	Moderately Important	Greater Than Moderately Important	Highly Important
9. Total Damage	74	4.66	0.65	0 (0.0)	0 (0.0)	7 (9.4)	11 (14.9)	56 (75.7)
10. Broken Kernels	74	4.16	0.95	0 (0.0)	4 (5.4)	16 (21.6)	18 (24.3)	36 (48.7)
11. Test Weight	74	4.46	0.73	0 (0.0)	1 (1.4)	7 (9.4)	23 (31.1)	43 (58.1)
12. Foreign Material	74	4.47	0.78	0 (0.0)	1 (1.4)	10 (13.5)	16 (21.6)	47 (63.5)
13. Defects	73	4.47	0.73	0 (0.0)	0 (0.0)	10 (13.7)	19 (26.0)	44 (60.3)
14. Seller	72	3.64	1.18	5 (6.9)	4 (5.6)	25 (34.7)	16 (22.2)	22 (30.6)

(Source: Survey Data [Appendix E])

characteristics -- broken kernels, test weight, foreign material, defects and DHV had similar responses.

Time in storage and information on the seller were included in the feedlot survey only and they drew 57.3 percent and 52.8 percent positive responses, which was low compared to the high degree of importance attached by feedlot operators on other descriptors.

Transportation and Storage Services

Transportation and storage services could also be provided through an electronic market. These potential services are different for elevators and producers because producer needs are more localized since they primarily store and sell or directly sell the grain. Elevators, on the other hand, store grain for producers and also buy, store and resell grain to other elevators or agencies. The responses of elevator managers are given in Table XIV. Transportation services available to elevators through electronic marketing might include:

1) locate truck transportation;
2) locate rail transportation;
3) locate barge transportation; and
4) negotiate freight rates.

The response means for these services were considerably lower than for earlier characteristics. Locating truck transportation had a response mean of 2.97 and a standard deviation of 1.36. Thirty six point seven percent of the elevators gave a positive response on the importance of this characteristic. Locating rail transportation yielded a response mean of 2.73 and a standard deviation of 1.43. Locating barge transportation had a lower response mean of 1.93. Only 11.5

TABLE XIV

ELEVATOR OPERATOR RESPONSES TOWARD POTENTIAL TRANSPORTATION AND STORAGE SERVICES OF A GRAIN ELECTRONIC MARKET

Potential transportation and storage services	Number of Observations	Mean	Standard Deviation	Responses - Frequency (Row Percent)				
				Not Important	Less Than Moderately Important	Moderately Important	Greater Than Moderately Important	Highly Important
1. Locate Truck Transportation	169	2.97	1.36	36 (21.3)	23 (13.6)	48 (28.4)	35 (20.7)	27 (16.0)
2. Locate Rail Transportation	167	2.73	1.43	48 (28.7)	29 (17.4)	36 (21.5)	29 (17.4)	25 (15.0)
3. Locate Barge Transportation	164	1.93	1.17	87 (53.0)	26 (15.9)	32 (19.5)	13 (7.9)	6 (3.7)
4. Negotiate Freight Rates	162	3.09	1.41	36 (22.2)	15 (9.3)	41 (25.3)	39 (24.1)	31 (19.1)

(Source: Survey Data [Appendix A and Appendix B])

percent of the respondents felt it was greater than moderately important to highly important. This may be because local and inland elevators seldom use barges for transporting grain. Also this level of trading may need more personal contacts which is more limited in electronic markets. Negotiating freight rates was considered the most important of all the transportation characteristics of an electronic market with a response mean of 3.09.

Transportation and storage services for grain producers might include:

1) Locate available storage for grain;

2) Offer grain to elevator at a set storage fee;

3) Locate transportation for moving grain; and

4) Negotiate freight rates for grain shipping.

The responses and summary statistics for producers are provided in Table XV. These services were viewed as moderately to greater than moderately important by the majority of producers. Producers may like to reduce the time and money spent in locating reliable and economical transportation and storage facilities for their grain. Since producers may want to hold the grain in storage in anticipation of better prices, storage costs can become an important factor. As with the elevators, grain producers want to be able to negotiate freight rates through the electronic market system.

Operational Characteristics

Operational characteristics which could be offered to both producers and elevators include the ability to:

TABLE XV

GRAIN PRODUCER RESPONSES TOWARD POTENTIAL TRANSPORTATION AND STORAGE SERVICES OF A GRAIN ELECTRONIC MARKET

Potential transportation and storage services	Number of Observations	Mean	Standard Deviation	Responses - Frequency (Row Percent)				
				Not Important	Less Than Moderately Important	Moderately Important	Greater Than Moderately Important	Highly Important
1. Locate Available Storage for Grain	284	3.18	1.41	48 (16.9)	47 (16.6)	64 (22.5)	56 (19.7)	69 (24.3)
2. Offer Grain to Elevator at a set Storage Fee	283	3.31	1.32	39 (13.8)	35 (12.4)	73 (25.8)	72 (25.4)	64 (22.6)
3. Locate Transportation for moving Grain	286	3.31	1.30	36 (12.6)	37 (12.9)	80 (28.0)	68 (23.8)	65 (22.7)
4. Negotiate Freight Rates for Grain Shipping	287	3.59	1.28	32 (11.1)	20 (7.0)	65 (22.7)	88 (30.7)	82 (28.5)

(Source: Survey Data [Appendix C and Appendix D])

1) Market grain knowing that buyer and seller performance is guaranteed;
2) Send and receive electronic mail; and
3) Use the computer for other consumer services (airline reservations, catalog shopping etc.,).

The results are given in Tables XVI and XVII for elevators and producers respectively. Performance guarantees are important in any new system. Performance guarantees are a way of minimizing risk. Lack of participation may occur if such guarantees are not included in an electronic method of marketing. Producers and elevator managers appear particular about who they do business with. Since electronic trading might not allow for the same personal contacts as does personal or manual training, this becomes more important. Both elevators and producers gave a high response mean of 3.80 and 4.42 respectively. Sixty five percent of elevators and 86 percent of the producers felt this characteristic was greater than moderately important to highly important. Electronic markets could also provide users with the privilege of sending and receiving electronic mail. A response mean of 2.81 for elevator and 3.09 for producers was observed. Today computers are being used for consumer services such as airline and hotel reservations, catalog shopping etc. These services could be incorporated through the grain electronic market system. However, this service got a low response mean from elevators (1.99) and a slightly higher mean from grain producers (2.60).

Grain producers might not be able to buy and maintain computer hardware required to remain subscribers of the system. They were asked to rate the importance attached by them towards accessing the system

TABLE XVI

ELEVATOR OPERATOR RESPONSES TOWARD POTENTIAL OPERATIONAL CHARACTERISTICS OF A GRAIN ELECTRONIC MARKET

Potential operational Characteristics	Number of Observations	Mean	Standard Deviation	Respsonses - Frequency (Row Percent)				
				Not Important	Less Than Moderately Important	Moderately Important	Greater Than Moderately Important	Highly Important
1. Buy Grain Described by an Independent Third Party	58*	2.90	1.21	9 (15.5)	11 (19.0)	22 (37.9)	9 (15.5)	7 (12.1)
2. Seller Performance Guaranteed	169	3.80	1.15	12 (7.1)	6 (3.6)	41 (24.3)	55 (32.5)	55 (32.5)
3. Send and Receive Electronic Mail	169	2.81	1.16	26 (15.4)	40 (23.7)	56 (33.1)	34 (20.1)	13 (7.7)
4. Use the Computer for Other Consumer Services	167	1.99	1.00	68 (40.7)	47 (28.1)	38 (22.8)	13 (7.8)	1 (0.6)

*Officers and Directors' Survey only

(Source: Survey Data [Appendix A and Appendix B])

TABLE XVII

GRAIN PRODUCER RESPONSES TOWARD POTENTIAL OPERATIONAL CHARACTERISTICS OF A GRAIN ELECTRONIC MARKET

Potential operational Characteristics	Number of Observations	Mean	Standard Deviation	Responses - Frequency (Row Percent)				
				Not Important	Less Than Moderately Important	Moderately Important	Greater Than Moderately Important	Highly Important
1. Seller Performance Guaranteed	286	4.42	0.88	4 (1.4)	8 (2.8)	28 (9.8)	71 (24.8)	175 (61.2)
2. Access the System from Home	287	3.91	1.09	11 (3.8)	20 (7.0)	57 (19.9)	95 (33.1)	104 (36.2)
3. Access the System from Local Agribusiness	283	3.59	1.17	22 (7.8)	22 (7.8)	77 (27.2)	90 (31.8)	72 (25.4)
4. Send and Receive Electronic Mail	280	3.09	1.30	48 (17.1)	33 (11.8)	93 (33.2)	59 (21.1)	47 (16.8)
5. Use the Computer for Other Consumer Services	285	2.60	1.36	82 (28.8)	59 (20.7)	70 (24.6)	38 (13.3)	36 (12.6)

(Source: Survey Data [Appendix C and Appendix D])

from their home or assessing it from a local agribusiness. Accessing it from their homes was given more importance (response mean 3.91) over accessing from a local agribusiness (response mean 3.59).

Organizational Characteristics

Certain functions of grain trading become more crucial once a trade is consummated. These involve ensuring a smooth transition of the product from the seller to the buyer and payment to the seller as agreed by both parties. Performance guarantees of some type are needed. It is not yet clear as to which organization(s) would take the initiative to organize and start a grain electronic marketing system. However, this organization would, in all probability, control the functioning of the system. These are some of the questions which were covered in all the surveys. The responses of elevator operators, producers and feedlot operators with the summary statistics are provided in Tables XVIII, XIX and XX respectively.

Ownership and Control

The respondents were asked who should own and control the electronic system. Of the elevators surveyed, 47.8 percent indicated a private third party firm should own and control the system. Thirty-one percent opted for buyers or buyer trade associations. The grain producer responses were different with 47 percent feeling it would be best if they or their trade associations owned and controlled the system. Thirty-four point seven percent thought this responsibility should go to a private third party firm. Of the 68 feedlot operators surveyed, 59 percent opted for a private third party firm and 26.5

TABLE XVIII

ELEVATOR OPERATOR RESPONSES TOWARD POTENTIAL ORGANIZATIONAL CHARACTERISTICS OF A GRAIN ELECTRONIC MARKET

Organizational Characteristics	Number of Observations	Responses - Frequency (Row Percent)				
		Producers	Buyers	Private Third Party Firms	Government	Others
1. Own and Control the System	163	22 (13.5)	50 (30.7)	78 (47.8)	4 (2.5)	9 (5.5)
2. Guarantee Grain Delivery	161	66 (41.0)	48 (29.8)	33 (20.5)	3 (1.9)	11 (6.8)
3. Guarantee Payment	161	11 (6.8)	106 (65.9)	34 (25.1)	4 (2.5)	6 (3.7)
4. Describe and Grade Grain	159	20 (12.6)	41 (25.8)	56 (35.2)	33 (20.7)	9 (5.7)
5. Guarantee Quality	158	76 (48.0)	39 (24.7)	30 (19.0)	3 (1.9)	10 (6.3)
6. Resolve Disputes	157	9 (15.5)	11 (19.0)	22 (37.9)	9 (15.5)	7 (12.1)

(Source: Survey Data [Appendix A and Appendix B])

TABLE XIX

GRAIN PRODUCER RESPONSES TOWARD POTENTIAL ORGANIZATIONAL CHARACTERISTICS OF A GRAIN ELECTRONIC MARKET

Organizational Characteristics	Number of Observations	Responses - Frequency (Row Percent)				
		Producers	Buyers	Private Third Party Firms	Government	Others
1. Own and Control the System	277	130 (47.0)	38 (13.7)	96 (34.7)	11 (4.0)	2 (0.6)
2. Guarantee Grain Delivery	281	195 (69.4)	34 (12.1)	42 (14.9)	10 (3.6)	0 (0.0)
3. Guarantee Payment	281	29 (10.3)	181 (64.4)	48 (17.1)	23 (8.2)	0 (0.0)
4. Describe and Grade Grain	279	54 (19.4)	33 (11.8)	124 (44.4)	66 (23.7)	2 (0.7)
5. Guarantee Quality	276	184 (66.7)	21 (7.6)	52 (18.8)	17 (6.2)	2 (0.7)
6. Resolve Disputes	273	22 (8.1)	13 (4.7)	188 (68.9)	44 (16.1)	6 (2.2)

(Source: Survey Data [Appendix C and Appendix D])

TABLE XX

FEEDLOT OPERATOR RESPONSES TOWARD POTENTIAL ORGANIZATIONAL CHARACTERISTICS OF A GRAIN ELECTRONIC MARKET

Organizational Characteristics	Number of Observations	Responses - Frequency (Row Percent)				
		Producers	Buyers	Private Third Party Firms	Government	Others
1. Own and Control the System	68	18 (26.5)	10 (14.7)	40 (58.8)	0 (0.0)	0 (0.0)
2. Guarantee Grain Delivery	68	34 (50.0)	7 (10.3)	27 (39.7)	0 (0.0)	0 (0.0)
3. Guarantee Payment	68	4 (5.9)	36 (52.9)	26 (38.2)	1 (1.5)	1 (1.5)
4. Describe and Grade Grain	68	10 (14.7)	7 (10.3)	35 (51.5)	16 (23.5)	0 (0.0)
5. Guarantee Quality	68	32 (47.1)	4 (5.9)	29 (42.6)	3 (4.4)	0 (0.0)
6. Resolve Disputes	68	3 (3.4)	12 (17.7)	46 (67.6)	4 (5.9)	3 (4.4)

(Source: Survey Data [Appendix E])

percent for producers or their trade associations.

Guarantee Grain Delivery

Survey respondents were asked who should be responsible for guaranteeing delivery of grain. Elevator operators, producers and feedlot operators agreed that producers or producer trade associations should guarantee grain delivery. This was indicated by 41 percent of elevator responses, 69.4 percent of producer responses and 50 percent of feedlot operator responses. This guarantee could be in the form of a contractual agreement which specifies all of the terms of trade and penalty for noncompliance.

Thirty percent of elevator responses, 12 percent of producer responses and 10.3 percent of feedlot operator responses indicated buyers should guarantee delivery. Twenty point five percent of elevators, 15 percent of producers and 39.7 percent of feedlot operators opted for a private third party firm.

Guarantee Payment

Some organization should guarantee that the terms and conditions of payment mutually agreed upon are honored. The responsibility of guaranteeing payment was analyzed in the surveys. Sixty six percent of elevator operators, 64.4 percent of producers and 53 percent of feedlot operators said that buyers or their trade associations should guarantee payment. The next favored response went to a private third party firm with 25 percent of the elevator operators, 17 percent of producers and 38.2 percent of feedlot operators opting for it.

Describe and Grade Grain

Description and grading of the grain could be handled by an objective third party. This opinion was voiced by 35.2 percent of the elevators, 44.4 percent of producers and 51.5 percent of feedlot operators. Twenty-five point eight percent of elevators, 11.8 percent of producers and 10.3 percent of feedlot operators felt that buyers or their trade associations should describe and grade grain. A significant number of grain producers (19.4 percent) and feedlot operators (14.7 percent) responded for producers or their trade associations. For the first time government involvement was sought in the form of describing and grading grain. Twenty point seven percent of the elevators, 23.7 percent of the producers and 23.5 percent of the feedlot operators said they would like to see the government describe and grade the grain.

Guarantee Quality

Guarantee of grain quality comes into prominence when the grain received by the seller does not conform to the same grades and quality described earlier when the grain was offered for sale. Forty-eight percent of the elevators, 66.7 percent of the producers and 48 percent of the feedlot operators said producers or their trade associations should guarantee quality. Twenty-four point seven percent of the elevator managers, 7.6 percent of the producers and 6 percent of the feedlot operators opted for buyers or their trade associations to guarantee quality. A private third party firm was favored by 19 percent of the elevators, 18.8 percent of the producers and 42.6 percent of the feedlot operators.

Resolve Disputes

A method of handling disputes would have to be developed to minimize conflict. Lack of confidence in an electronic system might lead to insufficient participation. This might lead to diseconomies and eventual failure of the system. Thirty-eight percent of the elevators thought that a private third party firm could best resolve disputes. Agreeing with them were 69 percent of the producers and 67.6 percent of the feedlot operators. Nineteen percent of the elevators, 4.7 percent of the producers and 17.7 percent of the feedlot operators opted for buyers or their trade associations. Government was chosen to resolve disputes by 15.5 percent of the elevators, 16 percent of the producers and six percent of the feedlot operators.

CHAPTER IV

SUMMARY AND CONCLUSIONS

Analyzing all the surveys has given an in depth feel of what potential users of the system perceive in a grain electronic market. Other studies have shown that grain producers and elevator operators have some concerns with the way the market is functioning presently. Some felt that lack of fast and accurate information about the market and highly localized and limited trading partners were severe handicaps.

The responses from all groups have shown that designing a common system to cater to the needs of all those involved in grain trade is possible. Some of the advantages of such a system are to avoid duplication of services, taking advantage of the economies of size by having a large and varied clientele.

There were no significant differences between the responses of Officers and Directors of state grain and feed associations and elevator managers. Grain producers represent another group and feedlot operators represent the other.

Elevator Operators

There were 169 elevator operators responding to the questions in both the survey. The respondents wanted the system to be highly flexible so that they could change bid or offer prices as frequently as they wished.

Elevator operators wanted more access to details of current trades or transactions, to summaries of all trades and to forward contract offers from producers. Commodity news was considered to be important. Information on prices at the world markets, at the national level, at the local level was considered increasingly important in that order. Elevator operators wanted information on forecast prices and futures prices. USDA reports were considered to be important. The respondents gave more importance to information on weather throughout the nation than local weather. Elevator operators wanted information on transportation rates relevant to the location at which the grain was sold.

Any offer for sale should be accompanied by adequate description of the commodity. Elevator operators wanted location of the commodity, conditions of delivery, quantity of grain offered for sale, moisture content of the grain and the U.S. grade to be specified. Total damage to the grain, broken kernels, test weight and foreign material were also some characteristics considered important. Elevator operators wanted seller or producer performance to be guaranteed against such things as defaulting and other irregular practices. The majority wanted private third party firms to own and control a grain electronic marketing system. Producers or their trade organizations were to guarantee grain quality and delivery, while buyers or their trade organizations were to guarantee payment to the seller. A private third-party firm was chosen to describe and grade grain and also to resolve any disputes.

Grain Producers

Two hundred and ninety-four grain producers responded to both the surveys (mail-out and personal interview) and their responses toward the system were more positive than grain elevator operators. Grain producers want to offer grain for sale at a set price and also be able to forward contract grain. The highest bidder should be able to purchase the grain through auction. Producers want to be able to interact or offer grain to more buyers. Placing and changing a reservation or floor price was important.

Grain producers want improved access to details of recent individual trades, to summaries of all trades, to cash price bids from buyers and to forward contract bids from buyers. Commodity news, prices at the local, national and world market levels, futures prices and forecast prices and trade leads were considered important. Information on weather locally and at the national level was also favored by producers.

Location of the grain, conditions of delivery, quantity offered, moisture content of the grain, U.S. grade, heat damage and total damage were some descriptive characteristics given prominence among others. Producers also wanted test weight, foreign material in the grain and defects to be included to describe the grain offered for sale. The system should enable its users to negotiate freight rates for shipping the grain.

Access to the system from homes was favored over access from local agribusiness, even though both were rated as important characteristics. Producers or their trade associations were to own and control the

system. They would also be held responsible for guaranteeing grain delivery and also guarantee the quality. Buyers or their trade associations were to guarantee payment as per the terms mutually agreed upon. A private third-party firm was preferred by most of the respondents to describe and grade the grain and also resolve disputes.

Feedlot Operators

A total of 324 surveys were mailed to feedlots in six states and 78 feedlots with a one time capacity of 5,000 head or more responded. Feedlot operators rated all of the potential descriptive characteristics of a grain electronic market important.

Grain offered for sale needs to be described by location, delivery conditions, quantity offered for sale, moisture content of grain, U.S. grade, protein, time in storage, heat damage, total damage, broken kernels, test weight, foreign material, and defects.

Private third-party firms were to own and control the system, describe and grade grain and resolve disputes. Fifty percent (34 respondents) wanted producers to guarantee grain delivery, while 40 percent (27 respondents) wanted a private third-party firm to perform this function. The choices for who should guarantee payment were divided with 53 percent (36 respondents) opting for buyers and 38.2 percent (26 respondents) opting for a private third-party firm. Forty seven percent (32 respondents) wanted producers or their trade associations to guarantee grain quality, while 42.6 percent (29 respondents) wanted a private third-party firm.

Conclusions

As mentioned earlier, designing a common system for all participants in the grain trade could lead to economies of scale and avoid duplication of the same services. The responses have indicated more interest in an information network than in a grain trading system. Generally feedlot operators have attached more importance to the system, followed by grain producers and elevator managers. Elevator managers may be better informed about the market presently than producers. They might have seen electronic marketing as giving more information and possible a better bargaining position for producers. Characteristics of a common grain electronic marketing system can now be defined. Potential users wanted the system to enable them to change bid or offer prices as frequently as they wished. Sellers thought that offering grain at a set price and waiting until a buyer bids that amount was an important characteristic. They also wanted to be able to forward contract grain in a similar fashion. Sellers also wanted to place a reservation or floor price unknown to buyers and also be able to change that price as frequently as they wish. The respondents seem to be cautious about the flexibility of the system with respect to changing offers and bids. They may want to be able to respond quickly to market signals. Most traders deal with very few and localized buyers and sellers. Dealing with a varied and far-flung clientele could provide users with more bargaining power and keep them better informed about the market.

The system should provide users improved access to details of current trades and also summaries of all trades in the market. Access to forward contract offers and bids was considered important. Commodity

news, local and national prices, futures prices, forecast prices, and transportation rates should be made available. News on commodities, local prices, national prices, futures prices and forecast prices and transportation rates should be made available to users.

Grain producers wanted more information such as local and national weather, trade leads. Grain offered for sale should be listed by location (FOB), delivery conditions, quantity offered, moisture content, U.S. grade, total damage, test weight, foreign material and defects. Producers want to be able to negotiate freight rates through the system. Guaranteeing seller performance was an important characteristic. Grain producers preferred access to the system from their homes, even though access from a local agribusiness was also important.

Perhaps the most conflicting and varied responses were in the areas of control and functioning of the system. Most of the elevator operators (48 percent) and feedlot operators (59 percent) wanted a private third party firm to own and control the electronic marketing system, while 47 percent of the producers wanted to own and control the system themselves. Producers or their trade association should guarantee grain delivery and quality. Buyers or their trade associations should guarantee payment. An almost equal number of feedlot operators opted for a private third party firm. A private third party firm should describe and grade the grain and also resolve disputes. Most of the respondents wanted little or no government involvement in such functions, though roughly twenty percent in each group chose the government to describe and grade the grain.

Even though statistically significant differences were not observed when analyzed by size of operation, type of organization, or crops

handled, the following trends were observed. Small sized elevators rated most characteristics as being more important, followed by medium sized elevators. Small sized elevators may feel handicapped by their size but would like to improve their position in the market. Large elevators on the other hand could be well established and informed, they might view electronic marketing as benefitting others more than themselves. The positive responses of producers increased with size. Large sized producers were most receptive to electronic markets. Larger size producers may be more efficient, progressive and would like to expand their markets. A similar trend was observed among feedlot operators also.

When analyzed by type of crop handled, elevators which handled soybeans were more positive toward electronic marketing followed by wheat and by corn handling elevators. Grain producers did not reveal any definite trends by crop grown.

Independent elevators in general seem to be more receptive towards the system than cooperative elevators. This may be due to cooperative elevators having a smaller market share in the states surveyed, moreover, decision making power in cooperative elevators might be more dispersed. On the other hand, independent elevators could be more aggressive, handling about two thirds of the domestic grain.

Much has been written in support of electronic marketing. This can further be exemplified by the theoretical and empirical work that has been done in this field. Researchers have also suggested the concept of designing a multiple commodity system to take advantages of scale economies due to increased volume and possible subsequent reduced per unit costs for users. Perhaps the most motivating factor for

potential users could be benefits from the system vs. the cost of using the system. The responses of elevator management, grain producers and feedlot operators have been fairly positive, indicating the potential for the success of a well designed and implemented electronic marketing system for grain.

It is not yet clear as to who would take the initiative to start an electronic marketing system for grains. Capital requirements for such an endeavor could be substantial. It has been mentioned earlier that electronic markets tend to bypass existing marketing organizations. However, an aggressive and innovative marketing institution may reap advantages from taking the lead in developing and implementing a grain electronic market.

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APPENDIX A

FEDERALLY INSPECTED WAREHOUSE MANAGERS QUESTIONNAIRE

WITH SUMMARY STATISTICS

LOCAL GRAIN ELEVATOR SURVEY-(SUMMARY)

Total Number of Respondents = 118

1. a. Name of firm: _____
   b. Type of organization: Cooperative 47, Independent 69 (Frequency)
   c. Type of facility: Local 106, Inland Subterminal 4, Inland terminal 5, Export 0 (Frequency)

2. Please list the names and locations of branch elevators or stations:

Name	Locations

3. Person completing survey: Name _____

   Position _____

   Address _____

   _____

   Phone and area code: ( ) _____

4. What was your total grain storage capacity as of July 1, 1982? 1079754 (AVG) (8100-7000000) bu.

5. What percentage of the grain delivered to your elevator in 1982 was delivered during the 1982 harvest? 65 (AVG) %

6. a. During 1982, approximately how many bushels of grain did you handle? 1695363 (AVG)
   b. During 1982, approximately what percentage of your total grain volume handled was (AVG)

Wheat	51 %	(0-100)
Corn	41 %	(0-100)
Soybeans	20 %	(0- 76)
Other	20 %	(0- 85)
Total	100 %	

7. What is the radius of your grain procurement area? 24 (AVG) (4-250)

8. How many other grain handling elevators are within your procurement area? 7 (AVG) (0-150)

9. During 1982, approximately how many producers did you buy grain from? 187 (AVG) (0-1400)

10. During 1982, approximately how many producers did you store grain for? 129 (AVG) (0-1250)

Electronic marketing of cash commodities involves using various forms of communication and data processing technology. Buyers and sellers trade cash commodities with the aid of conference telephones, video tape equipment, microcomputers, or computer terminals connected to large (main frame) computers. The objective of electronic markets is to create a centralized trading arena where all potential buyers and sellers can compete and finalize trades. Commodities are bought or sold based on description. Electronic markets have been tried for feeder pigs, slaughter hogs, feeder cattle, slaughter cattle, slaughter lambs, wholesale meat, eggs, cotton, and hay. Some electronic marketing systems are operated commercially, while others have not been successful.

11. Please indicate how familiar you were with electronic marketing before receiving this survey. (Frequency)

43	38	24	9	4
Not Familiar	Less Than Moderately Familiar	Moderately Familiar	Greater Than Moderately Familiar	Highly Familiar

12. Have you bought or sold commodities by an electronic marketing method? (FREQ) Yes 10 No 107

a. What method (see above statement)? _____
b. What commodity (see above statement)? _____

13. Are you aware of other merchandisers who have bought or sold their commodities by an electronic marketing method? Yes 24 (21%) No 92 (79%) (Frequency)

a. What method (see above statement)? _____
b. What commodity (see above statement)? _____

14. What types of electronic information systems are you currently using, if any?

_____

15. Please indicate the extent to which you feel each of the following potential pricing characteristics of an electronic market are important or not important to the merchandiser. (Frequency)

	Not Important	Less Than Moderately Important	Moderately Important	Greater Than Moderately Important	Highly Important
a. Expanded information about quantities of grains offered at specified prices.....	13	12	31	36	19
b. Ability to bid on grain based on producers' asking prices.....	11	14	40	29	17
c. Expanded procurement area for grain.....	13	18	33	25	21
d. Expanded sales area.....	12	12	31	23	31
e. Ability to participate in periodic grain auctions.....	25	33	31	14	7
f. Ability to change bid or offer prices as frequently as you wish	8	10	23	29	41

16. Please indicate the extent to which you feel each of the following potential information services of an electronic market are important or not important to the merchandiser. (Frequency)

	Not Important	Less Than Moderately Important	Moderately Important	Greater Than Moderately Important	Highly Important
a. Improved access to details of current sales or purchases	2	12	38	29	29
b. Improved access to summaries of all sales and purchases	2	10	39	38	22
c. Improved access to forward contract offers from producers	4	13	38	37	18
d. Improved access to information about available storage facilities	15	23	46	22	5

e.	Improved access to other market information:					
	1. Currency exchange rates	24	23	40	16	5
	2. News: general.....	6	19	53	21	6
	commodity.....	4	7	32	36	30
	3. Prices: local.....	4	7	29	38	33
	national.....	2	13	42	35	19
	world.....	2	18	47	28	15
	futures.....	2	6	27	31	46
	forecast.....	3	5	32	40	30
	4. Trade leads.....	8	14	36	31	20
	5. Transportation rates.....	6	12	30	42	21
	6. USDA reports.....	6	5	43	22	35
	7. Weather: local.....	8	13	39	32	19
	national.....	6	14	36	34	20
	world.....	9	17	40	28	13
	8. Other: _____					

17. Please indicate the extent to which you feel each of the following potential operational characteristics of an electronic market are important or not important to the merchandiser. Ability to: (Frequency)

	Not Important	Less Than Moderately Important	Moderately Important	Greater Than Moderately Important	Highly Important
a. Market grain knowing that seller performance is guaranteed.....	7	4	30	37	32
b. Send and receive electronic mail.....	16	27	40	20	8
c. Use the computers for other consumer services (airline reservations, catalog shipping, etc.).....	47	30	22	10	1
d. Other: _____					

18. Please indicate the extent to which you feel each of the following transportation services of an electronic market are important or not important to the merchandiser. Ability to: (Frequency)

	Not Important	Less Than Moderately Important	Moderately Important	Greater Than Moderately Important	Highly Important
a. Locate truck transportation....	18	15	34	26	17
b. Locate rail transportation.....	26	22	23	22	15
c. Locate barge transportation....	56	18	23	7	3
d. Negotiate freight rates.....	21	11	24	25	24

19. If an electronic market for buying or selling your grain was available, how would you rate the importance of each descriptive characteristic?

Merchandisers could buy or sell their grain based on the following descriptive characteristics: (Frequency)

	Not Important	Less Than Moderately Important	Moderately Important	Greater Than Moderately Important	Highly Important
a. Location (FOB a specific point)	3	7	27	36	38
b. Delivery conditions	2	7	32	36	35
c. Quantity	2	6	31	27	46
d. Moisture	4	9	30	30	38
e. U.S. Grade	4	7	29	29	42
f. Protein	10	16	31	21	29
g. Percent oil	28	21	27	16	14
h. Heat damage	7	19	29	29	25
i. Total damage	5	14	30	31	29
j. Broken kernels	6	16	32	29	26
k. Test weight	4	11	30	31	34
l. Foreign material	4	15	26	32	32
m. Defects	7	15	32	27	25
n. DHV	12	14	31	23	18
o. Other: _____					

20. There are several potential grain buyers and sellers as well as other firms that could be involved in an electronic market for grain. Please indicate the extent to which you feel each of the groups listed below may benefit from an electronic market for grain: (Freq)

	No Benefit	Less Than Moderate Benefit	Moderate Benefit	Greater Than Moderate Benefit	Great Benefit
a. Sellers:					
1. Grain producers	8	22	48	14	19
2. Elevators	3	7	35	32	35
3. Broker	2	9	26	23	50
b. Buyers:					
1. Livestock feeders or other farmers	6	25	48	20	10
2. Local elevators	5	13	41	28	24
3. Subterminal elevators	3	12	23	38	32
4. Inland terminal	3	9	21	35	36
5. Grain exporters	2	8	18	25	54
6. Grain millers and processors	2	8	22	28	44
7. Feed mills	4	13	30	33	26
8. Port elevators	2	8	23	25	46
c. Other firms:					
1. Commodity brokers	5	7	31	19	44
2. Transportation firms (railroads, barge, or trucking firms)	8	14	39	21	25
3. Private market information suppliers	4	12	28	24	37

21. Listed below are several groups which might be involved in an electronic market. If an electronic market for grains was formed, who should: (Frequency)

	Producers or Producer Trade Assns.	Buyers or Buyer Trade Assns.	*Private Third Party Firms	Govern-ment	Other
a. Own and control the system	20	39	46	4	0
b. Guarantee delivery of grain	47	38	20	3	4
c. Guarantee payment	11	71	22	3	2
d. Describe and grade grain	14	31	37	27	1
e. Guarantee quality	53	30	17	3	5
f. Resolve disputes	12	30	59	11	4

*The Private Third Party Firms would be independent firms set up specifically to organize and control these functions.

22. a. Please indicate the extent to which you feel there is a need for an electronic marketing system for grains. (Frequency)

10	30	47	17	11
No Need	Less Than Moderate Need	Moderate Need	Greater Than Moderate Need	Great Need

b. Give the principle reasons why or why not. _____

23. Indicate the degree to which you agree or disagree with each of the statements listed below. (Frequency)

	Strongly Disagree	Disagree	No Opinion or Neutral	Agree	Strongly Agree
a. Grain will be bought and sold through a computerized trading system within five years	4	33	40	33	3
b. Transportation services will be bought and sold through a computerized trading system within five years	6	43	40	23	3
c. Local elevators would use a computerized trading system	8	35	28	38	6
d. Inland terminal or subterminal elevators would use a computerized trading system	2	6	25	71	11
e. Export elevators would use a computerized trading system	1	2	18	69	23
f. I would use a computerized trading system	9	21	44	32	7
g. Local elevators would use a computerized information system	3	6	20	69	15
h. Inland terminal or subterminal elevators would use a computerized information system	1	2	16	67	26
i. Export elevators would use a computerized information system	0	0	15	69	29
j. I would use a computerized information system	2	7	23	65	16

24. If in fact a system is developed on a cost-efficient basis, would you have one? (Frequency)
Yes 35 No 14 Maybe 67

Approximately how much would you be willing to pay per month for the use of such a system? 279 (AVG) Number of responses = 52
(0-2000)

APPENDIX B

GRAIN AND FEED ASSOCIATION OFFICERS AND DIRECTORS

QUESTIONNAIRE WITH SUMMARY STATISTICS

LOCAL GRAIN ELEVATOR SURVEY - (SUMMARY)

Total Number of Respondents = 48

1. a. Name of firm: _____
   b. Type of organization: Cooperative 13, Independent 32 (Frequency)
   c. Type of facility: Local 36, Inland Subterminal 3, Inland terminal 2, Export 2 (Frequency)

2. Please list the names and locations of branch elevators or stations:

Name	Locations

3. Person completing survey: Name _____
   Position _____
   Address _____
   _____
   Phone and area code: ( ) _____

4. What was your total grain storage capacity including branch elevators as of July 1, 1982? 4630532 (AVG) bu.

5. In 1982, what percentage of the grain delivered to your elevator was delivered during 1982 harvest? 71 % (AVG) (2-100)

6. What is the radius of your grain procurement area? 47 (AVG) (7-300)

7. How many other grain handling elevators are within your procurement area? 12 (AVG) (2-131)

8. During 1982, approximately how many producers did you buy grain from? 462 (AVG) (20-3500)

9. During 1982, approximately how many producers did you store grain for? 357 (AVG) (0-3000)

10. a. During 1982, approximately how many bushels of grain did you handle? 4528866 (AVG)
    b. During 1982, approximately what percentage of your total grain volume handled was: (AVG)

Wheat	57 %	(1-100)
Corn	39 %	(1-98)
Soybeans	17 %	(1-45)
Other	27 %	(1-98)
Total	100 %	

11. Approximately what percentage of the grain purchased from farmers by your elevator was handled in each of the following ways? In column 1, indicate how grain was purchased in 1982. In column 2, indicate how you would have preferred to have purchased grain in 1982. (Average)

	Actual	Preferred
a. Purchased for cash immediately at harvest time (no contract)	24 %	28 %
b. Stored and purchased at a later date	50 %	48 %
c. Contracted for a harvest cash sale	10 %	16 %
d. Purchased at harvest time with payment deferred	9 %	12 %
e. Purchased from farm storage after harvest	20 %	30 %
f. Other (please specify) _____	%	%
Totals	100 %	100 %

12. Approximately what percentage of your grain sales (bushels) in 1982 was sold in the following manner? In column 1, indicate how grain was sold in 1982. In column 2, indicate how you would have preferred to have sold the grain. (Average)

	Actual	Preferred
a. Sold to farmers as grain or processed feed	28 %	41 %
b. Sold for immediate shipment (up to 15 days)	33 %	35 %
c. Sold for 15-30 day shipment	31 %	27 %
d. Sold for shipment after 30 days	38 %	43 %
e. Delivered against a futures contract	31 %	30 %
f. Other (please specify) _____	%	%
Totals	100 %	100 %

13. In 1982, approximately what percentage of your grain sales (bushels) was delivered in the following ways? In column 1, indicate how grain was sold in 1982. In column 2, indicate how you would have preferred to have sold the grain. (Average)

	Actual	Preferred
a. Was delivered to meet a specified grade	68 %	69 %
b. Utilized a contract specifying a price and delivery date, but which allowed for premiums or discounts if you deliver grain before or after the specified delivery date	56 %	70 %
c. Utilized a multiple shipment contract in which several deliveries are provided for in the same contract over a specified time period	52 %	39 %
d. All other methods	47 %	56 %
Totals	100 %	100 %

14. In 1982, what percentage of your grain sales (bushels) went to each of the following types of buyers? In column 1, indicate how your grain was distributed. In column 2, indicate how you would have preferred to have distributed the grain. (Average)

	Actual	Preferred
a. Cash brokers	39 %	50 %
b. Coop inland terminals or subterminals	46 %	64 %
c. Independent inland terminals or subterminals	34 %	59 %
d. Port terminals	67 %	75 %
e. Farmers	29 %	35 %
f. Millers, crushers, processors	20 %	21 %
g. Other (please specify) _____	%	%
Totals	100 %	100 %

15. How important is each factor listed in determining who you sold grain to in 1982? Please check the appropriate blank. (Frequency)

	Not Important	Less Than Moderately Important	Moderately Important	Greater Than Moderately Important	Highly Important
1) Price bid	0	0	1	2	40
2) Contractual arrangements	0	2	10	5	26
3) Advances or short term credit	11	4	8	8	12
4) Time and manner of payment	0	0	3	8	33
5) Premium and discount practices	1	0	8	12	23
6) Weighing accuracy	1	2	8	3	30
7) Penalties for delays in shipment	9	4	15	10	5
8) Premium for large volumes	13	5	15	4	6
9) Frequent & consistent bidder	0	2	16	12	14
10) Market information provided by the buyer	6	3	17	6	10
11) Brokerage services	17	13	5	3	4
12) Management and personnel	3	5	14	12	7
13) Terminal or processor facilities	10	8	11	8	5
14) Transportation services	12	12	6	6	7
15) Size of dividends and investment opportunities	27	5	5	5	1
16) Loyalty	6	4	14	9	11
17) Integrity of buyer	0	0	7	4	33
18) Other (please specify) _____					

16. For each of the following statements indicate how strongly you agree or disagree. (Frequency)

	Strongly Disagree	Disagree	No Opinion or Neutral	Agree	Strongly Agree
a. Grain is sold at an average price without the use of premiums or discounts	12 (26%)	19 (41%)	4 (9%)	9 (19%)	2 (5%)
b. Lower quality grain is discounted but no premium is paid for higher quality grain	11 (24%)	12 (26%)	2 (4%)	17 (37%)	4 (9%)
c. A premium is paid for high quality grain and all other grain is paid an average price	11 (24%)	22 (48%)	4 (9%)	8 (17%)	1 (2%)
d. Both premiums and discounts are used in the sale of grain	1 (2%)	8 (17%)	10 (22%)	15 (33%)	12 (26%)
e. I receive a reasonable margin on my grain sales	3 (7%)	10 (22%)	4 (9%)	21 (47%)	7 (15%)

17. Causes of market inefficiency, if any, can be related to prices not reflecting the value of products or to high grain handling costs. Please indicate the relative importance of each of the factors listed below as factors causing markets to be inefficient. (Frequency)

	Not Important	Less Than Moderately Important	Moderately Important	Greater Than Moderately Important	Highly Important
a. Lack of market information	4 (9%)	5 (11%)	15 (33%)	9 (20%)	12 (27%)
b. Not enough competition among buyers	6 (14%)	8 (18%)	18 (41%)	8 (18%)	4 (9%)
c. Lack of proper grading specifications, premiums and discounts at local elevators	3 (7%)	11 (25%)	13 (29%)	12 (27%)	5 (12%)
d. Unanticipated variations in the price of grain	2 (5%)	2 (5%)	14 (33%)	13 (31%)	11 (26%)
e. Lack of available transportation facilities	5 (11%)	8 (18%)	15 (34%)	6 (14%)	10 (23%)
f. Other: _____					

18. Which of the following are important objectives of your grain handling operation? (Frequency)

	Not Important	Less Than Moderately Important	Moderately Important	Greater Than Moderately Important	Highly Important
a. Obtain the best price.....	0	0	2	6	39
b. Obtain grain storage income	5	1	5	14	22
c. Hedge grain sales.....	11	7	14	6	8
d. Cash forward contract grain sales.....	6	8	12	8	13
e. Maintain high turnover.....	4	5	11	8	18
f. Maximize annual profit.....	1	0	2	6	37
g. Other: _____					

Electronic marketing of cash commodities involves using various forms of communication and data processing technology. Buyers and sellers trade cash commodities with the aid of conference telephones, video tape equipment, microcomputers, or computer terminals connected to large (main frame) computers. The objective of electronic markets is to create a centralized trading arena where all potential buyers and sellers can compete and finalize trades. Commodities are bought or sold based on description. Electronic markets have been tried for feeder pigs, slaughter hogs, feeder cattle, slaughter cattle, slaughter lambs, wholesale meat, eggs, cotton, and hay. Some electronic marketing systems are operated commercially, while others have not been successful.

19. Please indicate how familiar you were with electronic marketing before receiving this survey. (Frequency)

16	11	13	5	2
Not Familiar	Less Than Moderately Familiar	Moderately Familiar	Greater Than Moderately Familiar	Highly Familiar

20. Have you bought or sold commodities by an electronic marketing method? Yes 1 (2%) No 47 (98%) (Frequency)

a. What method (see above statement)? _____

b. What commodity (see above statement)? _____

21. Are you aware of other merchandisers who have bought or sold their commodities by an electronic marketing method? Yes 5 (10%) No 43 (90%) (Frequency)

a. What method (see above statement)? _____

b. What commodity (see above statement)? _____

22. What types of electronic information systems are you currently using, if any?

_____

23. Please indicate the extent to which you feel each of the following potential pricing characterstics of an electronic market are important or not important to the merchandiser. (Frequency)

	Not Important	Less Than Moderately Important	Moderately Important	Greater Than Moderately Important	Highly Important
a. Expanded information about quantities of grains offered at specified prices	5	3	23	8	7
b. Ability to bid on grain based on producers' asking prices	8	9	17	6	6
c. Expanded procurement area for grain	4	6	21	11	4
d. Expanded sales area	5	3	20	9	8
e. Ability to participate in periodic grain auctions	15	10	15	3	2
f. Ability to change bid or offer prices as frequently as you wish	7	6	14	8	11

24. Please indicate the extent to which you feel each of the following potential information services of an electronic market are important or not important to the merchandiser. (Frequency)

	Not Important	Less Than Moderately Important	Moderately Important	Greater Than Moderately Important	Highly Important
a. Improved access to details of current sales or purchases	4	6	18	11	7
b. Improved access to summaries of all sales and purchases	4	1	27	9	5
c. Improved access to forward contract offers from producers	4	5	16	15	4
d. Improved access to information about available storage facilities	8	12	18	3	3
e. Improved access to other market information:					

1. Currency exchange rates	13	17	8	3	3
2. News: general.....	6	8	17	7	6
commodity.....	2	4	11	17	10
3. Prices: local.....	1	4	12	15	14
national.....	2	5	14	13	9
world.....	3	8	14	9	9
futures.....	2	3	9	11	19
forecast.....	2	3	12	15	10
4. Trade leads.....	5	8	17	8	6
5. Transportation rates...	5	3	12	14	12
6. USDA reports.....	4	5	14	12	11
7. Weather: local.....	7	3	16	13	6
national.....	3	4	17	9	11
world.....	5	4	18	11	5
8. Other: _____					
_____					

25. Please indicate the extent to which you feel each of the following potential operational characterstics of an electronic market are important or not important to the merchandiser. Ability to: (Frequency)

	Not Important	Less Than Moderately Important	Moderately Important	Greater Than Moderately Important	Highly Important
a. Buy grain described by an independent third party	6	9	19	6	5
b. Market grain knowing that seller performance is guaranteed	4	2	9	14	17
c. Send and receive electronic mail	9	11	12	9	4
d. Use the computers for other consumer services (airline reservations, catalog shipping, etc.)	18	13	12	1	0
e. Other: _____					
_____					

26. Please indicate the extent to which you feel each of the following transportation services of an electronic market are important or not important to the merchandiser. Ability to: (Frequency)

	Not Important	Less Than Moderately Important	Moderately Important	Greater Than Moderately Important	Highly Important
a. Locate truck transportation	14	7	11	7	6
b. Locate rail transportation	15	7	11	5	7
c. Locate barge transportation	26	6	6	3	2
d. Negotiate freight rates	11	3	14	10	6

27. If an electronic market for buying or selling your grain was available, how would you rate the importance of each descriptive characteristic?

Merchandisers could buy or sell their grain based on the following descriptive characteristics: (Frequency)

	Not Important	Less Than Moderately Important	Moderately Important	Greater Than Moderately Important	Highly Important
a. Location (FOB a specific point)	4	2	8	14	17
b. Delivery conditions	2	1	12	12	18
c. Quantity	4	3	10	11	16
d. Moisture	2	2	14	12	14
e. U.S. Grade	2	2	13	11	16
f. Protein	4	7	15	9	10
g. Percent oil	12	14	9	4	3
h. Heat damage	3	5	13	11	11
i. Total damage	2	7	11	9	14
j. Broken kernels	2	6	13	7	14
k. Test weight	2	4	12	11	14
l. Foreign material	2	4	15	8	14
m. Defects	2	5	14	11	10
n. DHV	5	4	12	8	8
o. Other: _____					
_____					

28. There are several potential grain buyers and sellers as well as other firms that could be involved in an electronic market for grain. Please indicate how much you feel each of the groups listed below may benefit from an electronic market for grain? (Frequency)

	No Benefit	Less Than Moderate Benefit	Moderate Benefit	Greater Than Moderate Benefit	Great Benefit
a. Sellers:					
1. Grain producers	4	16	13	7	6
2. Elevators	4	4	17	9	12
3. Broker	2	2	6	18	17
b. Buyers:					
1. Livestock feeders or other farmers	2	10	16	11	5
2. Local elevators	6	5	14	12	9
3. Subterminal elevators	6	1	8	18	11
4. Inland terminal	5	3	6	18	12
5. Grain exporters	3	3	6	11	20
6. Grain millers and processors	3	2	8	15	16
7. Feed mills	3	2	16	14	10
8. Port elevators	5	3	10	12	14
c. Other firms:					
1. Commodity brokers	3 (7%)	2 (4%)	10 (22%)	13 (29%)	16 (36%)
2. Transportation firms (railroads, barge, or trucking firms)	4	3	18	11	9
3. Private market information suppliers	6	3	13	11	11

29. Listed below are several groups which might be involved in an electronic market. If an electronic market for grains was formed, who should: (Frequency)

	Producers or Producer Trade Assns.	Buyers or Buyer Trade Assns.	*Private Third Party Firms	Govern-ment	Other
a. Own and control the system.....	4	12	27	1	1
b. Guarantee delivery of grain.....	18	11	11	0	1
c. Guarantee payment.....	1	30	11	0	0
d. Describe and grade grain.....	6	8	21	8	1
e. Guarantee quality.....	20	10	12	0	0
f. Resolve disputes.....	3	13	22	1	5

*The Private Third Party Firms would be independent firms set up specifically to organize and control these functions.

30. a. Please indicate how strong you feel the need is for an electronic marketing system for grains? (Frequency)

10	15	17	3	0
No Need	Less Than Moderate Need	Moderate Need	Greater Than Moderate Need	Great Need

b. Give the principle reasons why or why not. _____

31. Indicate the degree to which you agree or disagree with each of the statements listed below. (Frequency)

	Strongly Disagree	Disagree	No Opinion or Neutral	Agree	Strongly Agree
a. Grain will be bought and sold through a computerized trading system within five years	5	13	14	10	0
b. Transportation services will be bought and sold through a computerized trading system within five years	3	12	20	5	2
c. Local elevators would use a computerized trading system	6	17	9	9	1
d. Inland terminal or subterminal elevators would use a computerized trading system	4	4	11	20	3
e. Export elevators would use a computerized trading system	2	3	9	23	5
f. I would use a computerized trading system	6	12	16	5	2
g. Local elevators would use a computerized information system	1	4	11	21	2
h. Inland terminal or subterminal elevators would use a computerized information system	5	0	5	26	5
i. Export elevators would use a computerized information system	0	3	5	25	9
j. I would use a computerized information system	3	4	11	19	5

32. If in fact a system is developed on a cost-efficient basis, would you have one? (Frequency)
Yes 9 (21%) No 4 (10%) Maybe 29 (69%)
Approximately how much would you be willing to pay per month for the use of such a system?
$342 (Average)
(150-1000)

APPENDIX C

GRAIN PRODUCER MAIL OUT QUESTIONNAIRE

WITH SUMMARY STATISTICS

GRAIN PRODUCER SURVEY-(Summary)

Total # of Respc..dents = 144

Name _____ Address _____ (Rural Route)

_____ (City)

State _____

Sex M___ F___ County _____

1. (a) How many acres of land did you own in 1982? Include land owned by your wife, or by your partners, if any. 487 (AVG) (0-3919)

(b) How many acres did you rent to others in 1982? 48 (AVG) (0-1355)

(c) How many acres of land did you or your partnership rent from others and operate in 1982? 421 (AVG) (0-2300)

(d) What is your on-farm storage capacity? 47888 (AVG) (0-600000) bu.

(e) Do you expect to increase your on-farm grain storage capacity in the next five years? 33 (24%) Yes 106 (76%) No (Frequency)

(f) How many acres did you have planted in the following crops in 1982? (AVG)

	Acres		Acres
Corn for grain. . .	302	Government Program . .	145
Soybeans.	284	Rice	99
Wheat	196	Grain for silage . . .	32
Milo for grain. . .	72	Permanent Pasture. . .	95
Hay	34	Farmstead, roads, wasteland, etc. . .	42
Cotton.	39	Other.	267
		Total Acres.	860

Electronic marketing involves using various forms of communication and data processing technology to buy or sell agricultural commodities. Buyers and sellers trade commodities with the aid of conference telephones, video tape equipment, microcomputers, or computer terminals connected to large (main frame) computers. The objective of electronic markets is to create a centralized trading arena where all potential buyers and sellers can compete and finalize trades. Commodities are bought or sold based on description. Electornic markets have been tried for feeder pigs, slaughter hogs, feeder cattle, slaughter cattle, slaughter lambs, wholesale meat, eggs, cotton, and hay. Some electronic marketing systems are operated commercially, while others have not been successful.

1. Please indicate how familiar you were with electronic marketing before this survey began? (Frequency)

64	39	35	3	1
Not Familiar	Less Than Moderately Familiar	Moderately Familiar	Greater Than Moderately Familiar	Highly Familiar

2. Have you marketed commodities by an electronic marketing method? (Frequency)
   7 (5%) Yes 135 (95%) No
   a. What method?(See above statement) _____
   b. What commodity?(See above statement) _____

3. Are you aware of other producers who have marketed their commodities by an electronic marketing method? 23 (16%) Yes 119 (84%) No (Frequency)
   a. What method?(See above statement) _____
   b. What commodity?(See above statement) _____

4. If an electronic market for selling your grain was available, how would you rate the importance of each of its potential pricing characteristics? Ability to: (Frequency)

	Not Important	Less Than Moderately Important	Moderately Important	Greater Than Moderately Important	Highly Important
a. offer grain at a set price and wait until a buyer bids that amount	6	14	50	38	31
b. forward contract grain at a set price and wait until a buyer bids that amount.	7	12	45	45	29
c. have grain auctioned to the highest bidder. .	27	28	38	24	21
d. place a reservation or floor price (unknown to buyers) on your grain.	13	10	44	40	30
e. change your reservation or floor price as frequently as you wish .	9	16	32	39	41
f. place futures market orders	12	24	46	35	20
g. offer grain to more buyers	4	1	27	40	67
h. Other _____					

5. If an electronic market for selling your grain was available, how would you rate the importance of each of its potential information services. (Frequency)

	Not Important	Less Than Moderately Important	Moderately Important	Greater Than Moderately Important	Highly Important
a. Improved access to details of the most recent individual trades	5	8	47	39	42
b. Improved access to summaries of all trades	3	6	51	43	38
c. Improved access to cash price bids from buyers	2	1	25	52	61
d. Improved access to forward contract bids from buyers	3	3	32	50	51

e.	**Improved access to other market information:**					
	1. news general . . .	5	14	66	30	24
	commodity . .	2	4	36	57	38
	2. prices, local	2	8	22	47	62
	national. . .	2	8	37	46	47
	world	2	5	44	45	43
	futures . . .	4	4	27	55	48
	forecast. . .	4	10	32	46	46
	3. transportation rates	7	14	52	37	29
	4. USDA reports.	10	12	47	39	30
	5. weather	6	6	45	38	44
	6. other_____					

6. If an electronic market for selling your grain was available, how would you rate the importance of each descriptive characteristic? Producers could sell their grain based on the following descriptive characteristics: (Frequency)

		Not Important	Less Than Moderately Important	Moderately Important	Greater Than Moderately Important	Highly Important
a.	location (FOB a specific point) . . .	4	5	42	31	59
b.	delivery conditions .	4	4	46	41	46
c.	quantity.	7	6	40	35	52
d.	moisture.	3	7	43	34	54
e.	U. S. grade	3	6	43	34	54
f.	protein	16	21	59	21	22
g.	percent oil(soybeans)	14	17	59	29	19
h.	heat damage	6	15	40	38	39
i.	total damage.	5	11	38	33	52
j.	broken kernels. . . .	9	20	49	34	26
k.	test weight	5	17	40	43	35
l.	foreign material. . .	5	14	46	37	37
m.	defects	7	14	46	37	28
n.	DHV	5	9	39	21	12
o.	other _____					

7. If an electronic market was available to sell your grain, how would you rate the importance of each of its potential storage and transportation services? Ability to: (Frequency)

		Not Important	Less Than Moderately Important	Moderately Important	Greater Than Moderately Important	Highly Important
a.	locate available storage for grain. . . .	27	21	33	27	29
b.	offer grain to elevators for a set storage fee. .	17	21	47	30	22
c.	locate transportation for moving your grain. .	17	21	44	26	29
d.	negotiate freight rates for grain shipping . . .	12	12	37	39	37
e.	Other _____					

8. If an electronic market was available to sell your grain, how would you rate the importance of each of its potential operational characteristics? Ability to:(Frequency)

	Not Important	Less Than Moderately Important	Moderately Important	Greater Than Moderately Important	Highly Important
a. market grain knowing that buyer performance is guaranteed	2	4	18	29	84
b. access the trading system from your home (with a telephone and computer terminal or microcomputer)	4	17	37	38	41
c. access the trading system from a local agribusiness	9	15	46	41	24
d. send and receive electronic mail	20	22	57	23	12
e. use the computers for other consumer services (airline reservations-catalog shopping, etc.)	37	40	39	11	9
f. other _____					

9. Listed below are several groups which might be involved in an electronic market. If an electronic market for grains was formed, who should: (Frequency)

	Producers or producer trade assns.	Buyers or buyer trade assns.	*Private third party firms	Govern-ment	Other
a. own and control the system	78	17	45	5	1
b. guarantee delivery of grain	102	17	20	5	0
c. guarantee payment	20	90	22	12	0
d. describe and grade grain	32	16	61	34	1
e. guarantee quality	98	9	26	9	1
f. resolve disputes	17	8	92	21	5

*The private third party firm would be an independent firm set up specifically to organize and control these functions.

10. Please indicate how strong you feel the need is for an electronic marketing system for grains. (Frequency)

9	28	55	32	14
No Need	Less Than Moderate Need	Moderate Need	Greater Than Moderate Need	Great Need

Give the principle reasons why or why not: _____

_____

11. Indicate the degree to which you agree or disagree with each of the statements listed below: (Frequency)

	Strongly Disagree	Disagree	Uncertain or no Opinion	Agree	Strongly Agree
a. grain will be bought and sold through a computerized trading system within 5 years.	2	16	43	60	6
b. transportation services will be bought and sold through a computerized trading system within 5 years.	4	16	65	37	5
c. local elevators will use a computerized trading system	1	7	27	85	7
d. I will use a computerized trading system	5	22	68	26	4
e. local elevators will use a computerized information system . .	0	2	17	93	14
f. I will use a computerized information system . .	5	12	52	45	12

(ADDITIONAL INFORMATION ABOUT FARM AND FARM OPERATOR)

Now could we have a little information about you, please?

1. (a) In what year were you born? (AVG) 1934 (1906 - 1958)

   (b) What is the highest grade of school you completed? (AVG) 13 (7-20)

   (c) How many years have you farmed since your 18th birthday? (AVG) 26 (3-59)

   (d) During how many of these _____ (entry in c) years have you produced wheat, corn, or soybeans? (AVG) 25 (3-59)

2. What proportion of your gross farm income is derived from the sale of grain? (AVG) 74% (10-100)

3. Do you produce livestock? Yes 71 No 56 (Frequency)

APPENDIX D

GRAIN PRODUCER PERSONAL INTERVIEW QUESTIONNAIRE

WITH SUMMARY STATISTICS

ID No. _____ (Co. - Person)

Form I
July 1983

A STUDY OF GRAIN MARKETING - SUMMARY

Total Number of respondents = 150

Name _____ Interviewer _____

Address _____ (Rural Route)

_____ (City)

Phone _____ _____ (Area Code)

	Date	Time
1st call	_____	_____
2nd call	_____	_____
3rd call	_____	_____

Starting Time _____

Sex (M) (F)

Hello, I am _____ (state name) and I am working for Oklahoma State University at Stillwater. The Department of Agricultural Economics at Oklahoma State is doing research on marketing alternatives for grain producers. As a part of this project, we are contacting farmers to find out what types of marketing systems are being used and what changes are being made or should be made to assure that markets are efficient and competitive. Particular emphasis will be placed on electronic marketing potential. Knowledge gained from this study will help advise grain producers about production and marketing practices. All information will be kept confidential and used only for research purposes. Your assistance will be greatly appreciated.

Did you produce any grain in 1982?

_____ Yes (go to page 2)

_____ No (stop)

SECTION I. GENERAL FARMING OPERATION

First, we would like some general information about your farming operation in 1982.

1. (a) How many acres of land did you <u>own</u> in 1982? Include land owned by your wife, or by your partners, if any. 625 (Average)

   (b) Of these _____(entry in a) acres, how many did you <u>rent to</u> others in 1982? 56 (Average)

   (c) Acres operated which you own (a - b) 600 (Average)

   (d) How many acres of land did you <u>rent from</u> others and operate in 1982? Include any land operated in partnership or as a corporation. 646 (Average)

   (e) Now this makes a total of 1214 acres operated in 1982. (Average)

   (f) What is your on-farm grain storage capacity? 35406 (Average) bushels

   (g) Do you expect to increase your on-farm grain storage capacity in the next five years? 44 Yes 103 No (Frequency)

2. (a) Now we would like to ask about the uses made of your _____ (entry in 1.e) acres during 1982. How many acres did you have in _____ (insert use).

   (b) For each of the grains listed, how much would you expect to produce per acre in an average year? _____

   (c) What percentage of each of the grains you produce is sold off the farm as grain in an average year.

   NOTE: Record crops by <u>total</u> acres if respondent recalls totals, OR if respondent reports by tract, record separately.

3. Do you own or use a computer in your farm business? (Frequency)
   23 Yes 127 No (Skip to Question 4)
   (15%) (85%)
   What type? _____

4. Do you plan to purchase or use a computer in your business within the next two years? (Frequency)
   14 Yes 88 No 30 Maybe
   (11%) (66%) (23%)

Table 1.

Land Use (Average)	Total acres in operation	1st tract	2nd tract	3rd tract	Avg. Yield /acre	Percentage Sold Off the Farm as grain
(a) Corn for grain.	399				132	81
(b) Soybeans.	824				37	95
(c) Wheat	654				43	92
(d) Milo for grain.	266				76	90
(e) Hay	82				64	75
(f) Cotton.	356				53	100
(g) Government program (diverted) . .	121					
(h) Rice.	273				107	100
(i) Grain for silage.	40				103	50
(j) Other cropland _____ (specify) . .	83				73	60
(k) Permanent Pasture	268				--	--
(l) Farmstead, roads, wasteland, etc.	46				--	--
TOTAL ACRES (See le above)						

SECTION II. GRAIN OUTLETS

Now we would like to talk about the outlets where you delivered or sold grain during 1982.

1. (a) Would you please tell me the name and city of each outlet to which you delivered or sold grain in 1982?

   (b) What percentage of your 1982 grain has not yet been sold 25 ? (Average)

   [For each market named, ASK]:

   (c) What percentage of the grain delivered or sold in 1982 was delivered or sold to _____?

   (d) At the bottom left of this page is a list of different types of market outlets. What type of market outlet was used?

   (e) At the bottom right of this page is a list of methods used to haul grain to market. What hauling method was used?

   (f) How far is this outlet from the farm from which you delivered the grain? _____

Table 2.

Name	(a) (Average) City	(c) Percentage	(d) *Type of market	(e) ** Hauling method(s)	(f) Distance from farm (mi.)
1		73%			10
2		41%			11
3		24%			17
4		36%			29

INTERVIEWER: Record code number(s) only for Cols. c and d. You may have more than one entry in these two columns.

*Type of market(s)

1 - local elevator
2 - grain processor
3 - grain exporter
4 - subterminal elevator
5 - another farmer (livestock producers)
6 - feed mill
7 - inland terminal
8 - gulf elevators
9 - other _____

**Hauling method(s)

1 - pickup truck
2 - pickup truck with trailer
3 - straight truck
4 - straight truck with trailer
5 - semi-trailer
6 - tractor and wagon
7 - other _____

(g) How many outlets did you consider using in 1982 but did not use? .54 (Average)

Several of the following questions are to be answered by using numerical scores you select from the range of "1" to "99". The numbers "1" and "99" represent extremes -- in importance, or in the degree of your agreement with a statement, or the like. If the attribute being indicated is of importance, a "1" means that it is of no importance, while a "99" means it is highly important.

In many instances you may want to indicate intermediate degrees by using scores between "1" and "99". On the "importance" scale, with a score of "1" indicating no importance and "99" indicating much importance, scores between "10" and "30" might be conceived of as indicating slight importance, scores between "40" and "60" as indicating moderate importance, and scores between "70" and "90" as indicating considerable but not maximum importance.

The distinctions you make should be as fine as you feel you can make them. Use the number along the range that you believe best expresses your judgment. If you feel you can distinguish between "50" and "52", do so. If you do not feel you can distinguish that finely, you may use scores that are multiples of "5" or "10". A check mark (x) indicates no opinion, undecided, or do not know.

2. Listed below are characteristics of markets that might influence you to choose a particular market outlet when selling grain. You have said that in 1982 you delivered grain to _____ (read markets given in Q. 1). For each factor please indicate by giving me a number from "1" to "99", how important it was to you in deciding to patronize these outlets. (Average)

Importance of Market Characteristics

The following scale may help keep the directions in mind

1	10	20	30	40	50	60	70	80	90	99
Not important				Moderately important					Highly important	

	Characteristics of Market	Degree of Importance
(a)	price received	83
(b)	convenient transportation	74
(c)	marketing cost	58
(d)	elevator is a cooperative	38
(e)	elevator is not a cooperative	28
(f)	speed and convenience of unloading the truck	70
(g)	reliability of the elevator management commitments	84
(h)	sale of farm input (fuel, fertilizer, etc.)	53
(i)	attitude of manager and employees	74
(j)	farm pickup of grain by the elevator	24
(k)	availability of storage facilities	65
(l)	Premium and discount schedules	68
(m)	Availability of forward contracts	69

SECTION III. MARKETING OBJECTIVES AND DECISIONS

1. (a) When you get ready to sell grain, from how many buyers do you usually obtain bids or price quotations? 2 (Average)

   (b) How soon after the grain price changes by more than 5 cents do you hear about the change?
   _____ Minutes 8 Hours _____ Days (Average)

   (c) How soon after learning of the above market change would you be able to sell grain if you so desired?
   86 Minutes _____ Hours _____ Days (Average)

2. Listed below are several possible sources of marketing information. Please indicate, by giving number from "1" to "99", how important each source is to you (prompt response by reading sources). (Average)

Importance of Marketing Information Sources

The following scale may help keep the directions in mind

1	10	20	30	40	50	60	70	80	90	99
Not important					Moderately important				Highly important	

a.	radio	72
b.	television	54
c.	newspaper	42
d.	farm magazines	39
e.	marketing newsletters	41
f.	wire service or teletype	37
g.	computerized information sources	31
h.	personal contacts	51

3. When deciding to market your grain, several different types of information may be important. Please indicate, by giving a number from "1" to "99", how important each type of information listed below is to you when making a selling decision. (Average)

Importance of Marketing Information

The following scale may help keep the directions in mind

1	10	20	30	40	50	60	70	80	90	99
Not important					Moderately important				Highly important	

a.	recent price trend over the last one to three weeks	63
b.	export activity and prospects	64
c.	crop estimates and carryover figures	60
d.	futures prices	68
e.	local elevator price the day of the sale	79
f.	private market analyst's expectations	45
g.	government or university market analysts	39
h.	storage available	54
i.	volume of grain being sold from your local area	43
j.	government loan price for 1982	59
k.	opinions of neighbors and friends	37
l.	consultation with bankers	40
m.	consultation with brokers	30

4. Generally, producers have objectives when marketing grain. Please indicate by giving a number from "1" to "99" how important each of the following listed below is in making marketing decisions. (Average)

Importance of Marketing Objectives

The following scale may help keep the directions in mind

1	10	20	30	40	50	60	70	80	90	99
Not important					Moderately important				Highly important	

a.	obtain the top price	85
b.	minimize storage costs	63
c.	reduce risk of adverse price change	68
d.	maximize annual profit	83
e.	avoid income fluctuations and high tax brackets	62
f.	meet loan payments	68
g.	other _____	

5. Causes of market inefficiency, if any, can be related to prices not reflecting the value of products or high grain handling costs. Please indicate, by giving a number from "1" to "99", the relative importance of each of the factors listed below as factors causing markets to be inefficient. (Average)

Importance of Factors Causing Inefficiency

The following scale may help keep the directions in mind

1 10 20 30 40 50 60 70 80 90 99

Not important — Moderately important — Highly important

a.	lack of market information	53
b.	not enough competition among buyers for your grain	64
c.	lack of proper grading specifications, premiums and discounts at local elevators	53
d.	unanticipated variations in the price of grain	57
e.	lack of available transportation facilities	41
f.	other _____	

6. Producers can market grain several different ways. During 1982, approximately what percentage of your grain did you sell or do you plan to sell using each of the methods listed below. (Average)

		Corn	Wheat	Soybeans
a.	Sell at harvest (no prior contract)	46	50	52
b.	Forward contract for cash sale at harvest	40	63	50
c.	Store on the farm and deliver later (no prior contract)	79	35	64
d.	Store on the farm with a contract for later delivery	74	73	59
e.	Store off the farm and sell later (no contract)	78	62	60
f.	Store off the farm with a contract for later sale	50	63	57
g.	Other _____			

7. Did you use the futures market to price any of the grain you sold?
Yes 49 (33%) No 101 (67%) (Frequency)

SECTION IV. ELECTRONIC MARKETING

(READ): Electronic marketing involves using various forms of communication and data processing technology to market agricultural commodities. Buyers and sellers trade commodities with the aid of conference telephones, video tape equipment, microcomputers, or computer terminals connected to large (main frame) computers. The objective of electronic markets is to create a centralized trading arena where all potential buyers and sellers can compete and finalize trades. Commodities are sold based on description. Often, commodities remain on the farm until the sale is completed and an acceptable price is established. Electronic markets have been tried for feeder pigs, slaughter hogs, feeder cattle, slaughter cattle, slaughter lambs, wholesale meat, eggs, cotton, and hay. Some electronic marketing systems are operated commercially, while others have not been successful.

Familiarity With Electronic Marketing

The following scale may help keep the directions in mind

1	10	20	30	40	50	60	70	80	90	99
Not familiar				Moderately familiar					Highly familiar	

1. Please indicate on a scale of "1" to "99" how familiar you were with electronic marketing before this interview began? 28 (Average)

2. Have you marketed commodities by an electronic marketing method? (Frequency)
   11 (7%) Yes 138 (93%) No
   a. What method? _____
   b. What commodity? _____

3. Are you aware of other producers who have marketed their commodities by an electronic marketing method? 29 (19%) Yes 121 (81%) No (Frequency)
   a. What method? _____
   b. What commodity? _____

4. If an electronic market for selling your grain was available, how would you rate the importance of each of its potential pricing characteristics? Please indicate by giving a number from "1" to "99" to reflect the relative importance of each of the characteristics listed below. (Average)

Importance of Potential Pricing Characteristics

The following scale may help keep the directions in mind

1	10	20	30	40	50	60	70	80	90	99
Not important				Moderately important					Highly important	

Potential Pricing Characteristics	
a. Producers could offer their grain at a set price and wait until a buyer bid that amount	71
b. Producers could offer to forward contract their grain at a set price and wait until a buyer bid that amount	70
c. Producers could have their grain auctioned to the highest bidder	52
d. Producers could place a reservation or floor price (unknown to buyers) on their grain	64
e. Producers could change their reservation or floor price as frequently as they wish	68
f. Producers could place futures market orders	65
g. Producers could offer their grain to more buyers	77
h. Other _____	

5. If an electronic market for selling your grain was available, how would you rate the importance of each of its potential information services. Please indicate by giving a number from "1" to "99" to reflect the relative importance of each of the information services listed below. (Average)

Importance of Potential Information Services

The following scale may help keep the directions in mind

1 10 20 30 40 50 60 70 80 90 99

Not important — Moderately important — Highly important

a. Producers could have access to details of the most recent individual trades	73
b. Producers could have access to summaries of all trades	74
c. Producers could have access to cash price bids from buyers	79
d. Producers could have access to forward contract bids from buyers	77
e. Producers could have access to other market information:	
1. currency exchange rates	58
2. news, general	61
commodity	74
3. prices, local	76
national	72
world	71
futures	77
forecast	69
4. trade leads	66
5. transportation rates	62
6. USDA reports	60
7. weather, local	67
national	68
world	63
8. other _____	

6. If an electronic market for selling your grain was available, how would you rate the importance of each descriptive characteristic? Please indicate by giving a number from "1" to "99" to reflect the relative importance of each of the descriptive characteristics listed below. (Average)

Importance of Descriptive Characteristics

The following scale may help keep the directions in mind

1	10	20	30	40	50	60	70	80	90	99
Not important					Moderately important				Highly important	

Producers could sell their grain based on the following descriptive characteristics:

a.	location (FOB a specific point)	72
b.	delivery conditions	74
c.	quantity	74
d.	moisture	73
e.	U. S. grade	73
f.	protein	65
g.	percent oil (soybeans)	62
h.	heat damage	66
i.	total damage	70
j.	broken kernels	63
k.	test weight	71
l.	foreign material	70
m.	defects	66
n.	DHV	60
o.	other _____	

7. If an electronic market was available to sell you grain, how would you rate the importance of each of its potential storage and transportation services? Please indicate by giving a number from "1" to "99" to reflect the relative importance of each of the storage and transportation services listed below. (Average)

Importance of Potential Storage and Transportation Services

The following scale may help keep the directions in mind

1	10	20	30	40	50	60	70	80	90	99
Not important					Moderately important				Highly important	

a.	Producers could locate available storage for grain	58
b.	Producers could offer grain to elevators for a set storage fee	63
c.	Producers could locate transportation for moving their grain	61
d.	Producers could negotiate freight rates for grain to be shipped	80
e.	Other _____	

8. If an electronic market was available to sell your grain, how would you rate the importance of each of its potential operational characteristics? Please indicate by giving a number from "1" to "99" to reflect the relative importance of each of the operational characteristics listed below. (Average)

Importance of Potential Operational Characteristics	
The following scale may help keep the directions in mind	
1 10 20 30 40 50 60 70 80 90 99	
Not important — Moderately important — Highly important	

a.	Producers could market grain knowing that buyer performance is guaranteed	83
b.	Producers could access the trading system from their home (with a telephone and computer terminal or microcomputer)	77
c.	Producers could access the trading system from a local agribusiness (elevator, lender, farm supply dealer, etc.)	69
d.	Producers could send and receive electronic mail	59
e.	Producers could use the computers for other consumer services (airline reservations, catalog shipping, etc.)	50
f.	other _____	

9. There are several potential grain sellers and buyers as well as other firms that could be involved in an electronic market for grain. Please indicate on a scale of "1" to "99" how much you feel each of the groups listed below may benefit from an electronic market for grain? (Average)

Benefit for Grain Buyers and Sellers	
The following scale may help keep the directions in mind	
1 10 20 30 40 50 60 70 80 90 99	
No benefit — Moderate benefit — Great benefit	

a.	Sellers:	
	1. grain producers	73
	2. elevators	76
	3. broker	74
b.	Buyers:	
	1. livestock feeders or other farmers	76
	2. local elevators	73
	3. grain millers and processors	76
	4. feed mills	75

10. Listed below are several groups which might be involved in an electronic market. If an electronic market for grains was formed, who should: (Frequency)

		Producers or producer trade assns.	Buyers or buyer trade assns.	Private third party firms	Govern-ment	Other
a.	own and control the system	94	32	47	12	4
b.	guarantee delivery of grain	111	29	14	11	2
c.	guarantee payment	20	107	15	19	2
d.	describe and grade grain	35	49	51	37	0
e.	guarantee quality	102	18	30	17	2
f.	resolve disputes	27	20	94	26	8

Need for a Grain Electronic Marketing System

The following scale may help keep the directions in mind

1	10	20	30	40	50	60	70	80	90	99
No need					Moderate need					Great need

11. Please indicate on a scale of "1" to "99" how strong you feel the need is for an electronic marketing system for grains. 62

Give the principle reasons why or why not: _____

12. Indicate the degree to which you agree or disagree with each of the statements listed below using a number from "1" to "99". (Average)

Extent of Agreement or Disagreement with Statement

The following scale may help in keeping the directions in mind

1	10	20	30	40	50	60	70	80	90	99
Strongly disagree					Uncertain or no opinion					Strongly agree

a.	I expect grain will be bought and sold through a computerized trading system within 5 years	69
b.	I expect transportation services will be bought and sold through a computerized trading system within 5 years	62
c.	I expect my local elevator will use a computerized trading system	73
d.	I expect I will use a computerized trading system	52
e.	I expect my local elevator will use a computerized information system	79
f.	I expect I will use a computerized information system	59

13. If in fact a system is developed on a cost-efficient basis, would you have one?
62 Yes 28 No 59 Maybe (Frequency)
(42%) (19%) (39%)

14. How much would you be willing to pay per month for the use of such a system?____
101

SECTION V. ADDITIONAL INFORMATION ABOUT FARM AND FARM OPERATOR

Now could we have a little information about you, please?

1. (a) In what year were you born? (Average) 1938

(b) What is the highest grade of school you completed? (Average) 13

(c) How many years have you farmed since your 18th birthday? (AV) 23

(d) During how many of these _____ (entry in c) years have you produced (wheat/corn/soybeans)? (Average) 23

2. What proportion of your gross farm income is derived from sale of grain? (Average) 76

3. Do you produce livestock? Yes 80 (54%) No 69 (46%) (Frequency)

Thank you for yor time and cooperation.

Ending Time: _____

APPENDIX E

FEEDLOT OPERATOR QUESTIONNAIRE WITH

SUMMARY STATISTICS

FEEDLOT SURVEY
Department of Agricultural Economics
Oklahoma State University

Name of Firm: _____
Address: _____
Phone: (___)_____
Name of Person Completing the Survey: _____
Position: _____
Current Capacity of Feedlot 20990 5000-180000 head
During 1982, approximately what percentage of the cattle fed were owned by the feedlot?
31 %

I. GENERAL

1. For each of the following potential sources of information, indicate their relative importance to your firm as a source of market information on grain and cattle. Please consider both the futures and cash market.

Source of Information	Not Important	Less Than Moderately Important	Moderately Important	Greater Than Moderately Important	Very Important
Packers' Opinions	9(12%)	15(20%)	29(38%)	12(15%)	12(15%)
Cattle Trade Associations (Texas Cattle Feeders, Cattlefax, etc.)	1(1%)	4(5%)	22(28%)	24(31%)	27(35%)
Commodity Brokers	5(6%)	18(23%)	33(43%)	15(20%)	6(8%)
Grain & Other Consultants	3(4%)	10(13%)	38(50%)	19(25%)	6(8%)
Other Feeders' Opinions	4(5%)	8(11%)	39(51%)	22(29%)	3(4%)
Private Newsletters	7(9%)	20(26%)	38(50%)	11(14%)	1(1%)
Radio	14(19%)	28(37%)	23(30%)	10(13%)	1(1%)
Technical Data (Charts, moving averages, ect.)	7(9%)	21(28%)	27(35%)	16(21%)	5(7%)
Television	29(38%)	30(39%)	16(21%)	2(2%)	0
University Newsletter	22(28%)	31(40%)	21(27%)	4(5%)	0
Videotex (Agristar, Instant Update, etc.)	15(21%)	15(21%)	19(26%)	9(13%)	14(19%)
Wire Service (LFM, GIN, CNS, etc.)	6(8%)	1(1%)	17(24%)	21(29%)	27(38%)
Other: _____					
_____					

2. Have you heard about electronic marketing (teleauctions, video auctions, or computerized systems) of agricultural commodities? Yes 78 No 0
   a. If yes, what type? Teleauction 21 Video Auction 76
      Computerized Trading Systems 17
   b. If yes, what comodities? Feeder Cattle 78 Fed Cattle 14 Feeder Pigs 6
      Slaughter Hogs 5 Slaughter Lambs 3 Cotton 4
   c. If yes, please indicate the extent to which the majority of your information about electronic marketing was favorable or unfavorable.

4(5%)	24(31%)	42(54%)	6(8%)	2(2%)
Not Favorable	Less Than Moderately Favorable	Moderately Favorable	Greater Than Moderately Favorable	Highly Favorable

3. Have you ever bought or sold anything through electronic marketing? Yes 22 No 55
   a. If yes, what type? Teleauction 2 Video Auction 20
      Computerized Trading Systems 4
   b. If yes, what commodities? Feeder Cattle 20 Fed Cattle 3 Feeder Pigs 0
      Slaughter Hogs 0 Slaughter Lambs 1 Cotton 1
   c. If yes, to what extent was the experience favorable or unfavorable?

2(8%)	3(13%)	14(58%)	3(13%)	2(8%)
Not Favorable	Less Than Moderately Favorable	Moderately Favorable	Greater Than Moderately Favorable	Highly Favorable

   Please explain:

_____

_____

_____

4. Who would you prefer to trade with on an electronic marketing system for grains?
   Brokers 20 Elevators 40 Farmers 20

5. Does the feedlot use a computer? Yes 56 No 21
   a. If yes, what brand? _____ Model? _____
   b. For what functions do you use your computer? _____

_____

II. GRAIN

1. During 1982, approximately what percent of the feed grains volume was corn? 75%
   During 1982, approximately how many bushels of corn was fed? 5.6mil bu.
   1-150 mil bu.

2. Please complete the following table with respect to corn purchased during 1982.
   a. City and State of top 5 suppliers of corn.
   b. Percent of total corn purchases originating from supplier.
   c. Type of Supplier (Brokers, Elevators, Farmers, produced by your feedlot ownership or affiliate).
   d. Hauling method (truck, rail, or barge).
   e. Distance from feedlot.

a. City, State	b. Percent	c. Type of Supplier	d. Hauling Method	e. Distance from Feedlot
	63% (NR=41)			88 (NR=58)
	17% (NR=55)			108 (NR=42)
	9% (NR=55)			65 (NR=35)
	5% (NR=51)			107 (NR=24)
	5% (NR=48)			133 (NR=14)

3. What percent of your corn is graded by:

Unofficial grade: Buyer does grading	57 %	(0-75%)	NR=65
Unofficial grade: Seller does grading	6 %		NR=65
Official government grade	18 %		NR=65
Not graded	20 %		NR=65
TOTAL	100%		

4. For each of the following statements, please indicate the extent that you agree or disagree.

	Strongly Disagree	Disagree	No Opinion Or Neutral	Agree	Strongly Agree
I am satisfied with the quality of grain I am able to purchase.....	1(1%)	5(6%)	7(9%)	53(70%)	10(13%)
I have no problem locating sufficient quantities of grain.....	0	7(9%)	6(8%)	55(72%)	8(11%)
I feel the local basis is in line with market conditions.....	3(4%)	14(18%)	13(17%)	41(54%)	5(7%)
I have no problems collecting discounts for grain not meeting specifications.....	3(4%)	8(11%)	9(12%)	48(64%)	7(9%)
Overall, I am satisfied with the method I am currently using to purchase feed grains.	1(1%)	7(9%)	11(15%)	47(62%)	10(13%)
An electronic information system could help me locate grain more readily.....	0	12(16%)	34(45%)	25(33%)	5(6%)
An electronic information system would allow me to procure grain at a lower cost..	3(4%)	16(21%)	47(63%)	7(9%)	2(3%)
I would like to see an electronic information system be developed for grains.....	2(3%)	10(13%)	32(43%)	28(37%)	3(4%)
I would use an electronic information system for grains.....	2(3%)	12(16%)	36(47%)	23(30%)	3(4%)
An electronic trading system would allow me to procure grain at a lower cost..	3(4%)	20(26%)	47(62%)	3(4%)	3(4%)
I would like to see an electronic trading system be developed for grains.....	3(4%)	11(14%)	35(46%)	24(32%)	3(4%)
I would use an electronic trading system for grains.....	3(4%)	14(18%)	40(53%)	16(21%)	3(4%)

5. If an electronic market for buying or selling grain was available, how would you rate the importance of each descriptive characteristic?

	Not Important	Less Than Moderately Important	Moderately Important	Greater Than Moderately Important	Very Important
a. Location (FOB a specific point).	4(5%)	1(1%)	13(17%)	8(11%)	49(66%)
b. Delivery conditions.....	0	0	8(11%)	18(24%)	49(66%)
c. Quantity.....	1(1%)	4(5%)	22(30%)	18(24%)	30(40%)
d. Moisture.....	1(1%)	2(3%)	12(16%)	12(16%)	46(64%)
e. U.S. Grade.....	0	3(4%)	14(19%)	22(29%)	36(48%)
f. Protein.....	4(5%)	4(5%)	23(31%)	21(29%)	22(30%)
g. Time in storage.....	2(3%)	10(13%)	20(27%)	24(32%)	19(25%)
h. Heat damage.....	0	0	7(10%)	14(19%)	52(71%)
i. Total damage.....	0	0	7(9%)	11(15%)	56(76%)
j. Broken kernels.....	0	4(5%)	16(22%)	18(24%)	36(49%)
k. Test weight.....	0	1(1%)	7(10%)	23(31%)	43(58%)
l. Foreign material.....	0	1(1%)	10(14%)	16(22%)	47(64%)
m. Defects.....	0	0	10(14%)	19(26%)	44(60%)
n. Seller.....	5(7%)	4(5%)	25(35%)	16(22%)	22(31%)
o. Other: _____					

6. What percentage of your corn purchased was handled in the following way?

NR=67	62 %	No discount: corn met specification
NR=66	6 %	No discount: corn not accepted
NR=66	19 %	Discount using southwest scale
NR=66	11 %	Other discount procedure (explain): _____
	100%	_____

7. Attached is the current southwest scale for corn. Would it be acceptable for discounting corn in an electronic marketing system? Yes 56 No 10
If no, please make those changes directly on the scale which would make it acceptable.

Corn

Trading Basis No. 2 Corn per Hundredweight.

Premium----------15¢ for No. 1

Discounts

Moisture----------	Moisture deductions are by weight equal to 1.5 times percentage moisture above 15.5%. Deductions for moisture shall be taken from the net weight before other discounts are applied.
Test Weight----------	1¢ for each 1 lb. or fraction thereof from 53.9 lbs. to 50 lbs.; 5¢ for each 1 lb. or fraction thereof below 50 lbs.
Broken Corn & Foreign Material-----	2¢ for each 1% or fraction thereof from 5.1% to 10%; 4¢ for each 1% or fraction therof from 10.1% to 20%.
Heat Damage----------	1¢ for each 0.1% from 0.3% through 3%.
Total Damage ----------	2¢ for each 1% or fraction thereof from 5.1% to 15%; 4¢ for each 1% or fraction thereof from 15.1% to 20%.
Heating----------	5¢
Musty*----------	10¢
Sour*----------	10¢
Weevily*----------	5¢

*If grain is musty, sour or weevily, buyer has option of applying discounts or returning grain to seller at seller's expense.

If discounts exceed ranges in this scale or if grain is of Distinctly Low Quality, buyer has option, upon notifying seller, of negotiating additional discounts or returning grain at seller's expense.

EXAMPLE

Purchase 61,500 lbs. of No. 2 corn at $4.20/cwt. with the Southwest Scale of Grain Premiums & Discounts to apply.

Factor	Sample Report	Adjustment	Discount
Moisture----------	16.8%	over 1.3%	(see below)
Test Weight----------	54.0 lbs.	none	0
Broken Corn & Foreign Material--	9.8%	over 4.8%	10¢
Heat Damage----------	0.4%	over 0.2%	2¢
Total Damage----------	12.7%	over 7.7%	16¢
		TOTAL	28¢

Calculations

Moisture discount----------	1.3% X 1.5 = 1.95%
Moisture deduction----------	61,500 lbs. X 1.95% = 1,199 lbs.
Pay weight----------	61,500 lbs. - 1,199 lbs. = 60,301 lbs.
Pay price----------	$4.20 - $0.28 = $3.92
PAYMENT----------	$60,301 lbs. X $3.92 = $2,363.80

III. TRANSPORTATION

1. For each of the following statements, please indicate the extent that you agree or disagree.

	Strongly Disagree	Disagree	No Opinion Or Neutral	Agree	Strongly Agree
I generally have no problems locating transportation for feed grains purchased.....	0	0	2(3%)	57(76%)	75(21%)
I believe the rail transportation rates are appropriate.....	3(4%)	11(15%)	44(60%)	15(20%)	1(1%)
I believe the truck transportation rates are appropriate.....	1(1%)	12(16%)	20(27%)	40(53%)	2(3%)
An electronic marketing system could help me locate transportation more readily.....	2(3%)	16(22%)	38(51%)	17(23%)	1(1%)
An electronic marketing system would allow me to procure transportation at a lower cost.....	3(4%)	18(24%)	44(60%)	8(11%)	1(1%)
I would like to see an electronic marketing system be developed for transportation services.....	2(3%)	12(16%)	46(61%)	14(19%)	1(1%)
I would use an electronic marketing system for transportation services.....	3(4%)	16(21%)	44(59%)	11(15%)	1(1%)
I believe within 5 years an electronic marketing system for grains and transportation services will be operating....	2(3%)	11(15%)	41(55%)	18(24%)	3(4%)

2. Do you own your own trucks for transporting grain to the feedlot? Yes 25 No 50

3. During 1982, approximately what percent of your corn was purchased with the following conditions:

FOB Feedlot 73 % FOB Origin 27 %
Other: _____ 0 %

IV. ADDITIONAL INFORMATION

1. Listed below are several groups which mignt be involved in an electronic market. If an electronic market for grains was formed who should:

	Producers or Producer Trade Assns.	Buyers or Buyer Trade Assns.	*Private Third Party Firms	Govern-ment	Other
a. Own and control the system.....	21(31%)	12(18%)	40(59%)	0	0
b. Guarantee delivery of grain.....	33(49%)	7(10%)	27(40%)	0	0
c. Guarantee payment.....	4(6%)	36(53%)	26(38%)	1(1%)	1(1%)
d. Describe and grade grain.....	14(21%)	7(10%)	36(53%)	16(24%)	0
e. Guarantee quality.....	32(47%)	4(6%)	29(43%)	3(4%)	0
f. Resolve dispute.....	13(19%)	14(21%)	47(69%)	5(7%)	3(4%)

* The Private Third Party Firms would be independent firms set up specifically to organize and control these functions.

2. For your feedlot, list the major advantages of an electronic marketing system for grain and transportation services.

3. For your feedlot, list the major disadvantages of an electronic marketing system for grain and transportation services.

APPENDIX F

CHISQUARE VALUES AND OBSERVED SIGNIFICANCE LEVELS FOR TESTS ON RELATIONSHIPS BETWEEN RESPONDENT GROUPS AND POTENTIAL CHARACTERISTICS OF A GRAIN ELECTRONIC MARKET

APPENDIX F

Characteristic	Elevator Operator Responses: Type of Organization		Size of Operation		Crop Handled	
	Chi-Sq	OSL[1]	Chi-Sq	OSL[1]	Chi-Sq	OSL[1]
Pricing Characteristics						
a. Expanded information on quantities of grains offered at specific prices	6.478	0.1662	9.838	0.2766	5.488	0.7044
b. Ability to bid on grain based on producer's asking prices	4.383	0.3566	10.018	0.2638	2.814	0.9455
c. Expanded procurement area for grain	5.366	0.2517	2.957	0.9370	2.687	0.9525
d. Expanded sales area	0.267	0.9918	4.737	0.7853	1.865	0.9879
e. Ability to participate in periodic grain auctions	1.817	0.7694	5.560	0.6964	2.238	0.9728
f. Ability to change bid or offer prices as frequently as you wish	5.378	0.2507	6.442	0.5978	2.435	0.9647
Information Services						
a. Improved access to details of current sales or purchases	1.563	0.8154	15.746	0.0462	7.377	0.4965
b. Improved access to summaries of all sales and purchases	0.689	0.9527	8.346	0.4004	1.954	0.9824
c. Improved access to forward contract offers from producers	1.910	0.7522	10.749	0.2163	2.524	0.9606
d. Improved access to information about available storage facilities	2.067	0.7235	7.099	0.5260	1.010	0.9982

Characteristic	Elevator Operator Responses					
	Type of Organization		Size of Operation		Crop Handled	
	Chi-Sq	OSL[1]	Chi-Sq	OSL[1]	Chi-Sq	OSL[1]
e. Currency exchange rates	6.193	0.1852	4.946	0.7633	7.061	0.5301
News: general	4.955	0.2920	9.070	0.3364	1.802	0.9865
commodity	4.710	0.3183	8.202	0.4140	4.468	0.8126
Prices: local	3.823	0.4305	6.927	0.5445	2.374	0.9673
national	3.238	0.5188	4.162	0.8422	3.921	0.8642
world	4.821	0.3062	3.909	0.8653	4.833	0.7753
futures	7.049	0.1333	13.363	0.1000	1.943	0.9827
forecast	2.435	0.6563	9.126	0.3318	7.435	0.4905
Trade leads	1.508	0.8252	15.294	0.0537	2.292	0.9707
Transportation Rates	2.470	0.6500	7.144	0.5212	7.466	0.4872
USDA reports	3.022	0.5542	9.956	0.2681	6.682	0.5713
Weather: local	4.009	0.408	12.149	0.1447	2.192	0.9745
national	3.437	0.4875	7.235	0.5115	7.019	0.5346
world	4.215	0.3776	8.795	0.3599	5.313	0.7236
Operational Characteristics						
a. Market grain knowing that seller performance is guaranteed	0.767	0.9428	12.814	0.1184	2.621	0.9558
b. Send and receive electronic mail	0.938	0.9191	15.492	0.0503	3.939	0.8626
c. Use the computer for other consumer services	2.906	0.5737	7.064	0.5298	3.464	0.9004
Transportation Services						
a. Locate truck transportation	3.583	0.4654	5.196	0.7364	3.998	0.8573
b. Locate rail transportation	1.382	0.8474	4.634	0.7959	8.411	0.3944
c. Locate barge transportation	8.190	0.0849	11.485	0.1757	2.491	0.9621
d. Negotiate freight rates	8.941	0.0626	3.831	0.8720	5.825	0.6669

Characteristic	Elevator Operator Responses					
	Type of Organization		Size of Operation		Crop Handled	
	Chi-Sq	OSL[1]	Chi-Sq	OSL[1]	Chi-Sq	OSL[1]
Descriptive Characteristics						
a. Location (FOB)	3.490	0.4794	3.878	0.8679	2.452	0.9639
b. Delivery conditions	6.615	0.1577	4.984	0.7592	1.919	0.9834
c. Quantity	4.405	0.3539	6.558	0.5850	1.527	0.9922
d. Moisture	6.743	0.1501	6.573	0.5635	1.100	0.9975
e. U.S. Grade	8.772	0.0671	8.837	0.3562	1.997	0.9811
f. Protein	8.161	0.0859	4.723	0.7867	13.532	0.0948
g. Percent Oil	5.865	0.2094	10.806	0.2129	3.714	0.8819
h. Heat Damage	5.924	0.2049	7.503	0.4834	3.256	0.9172
i. Total Damage	6.903	0.1411	4.366	0.8227	2.838	0.9441
j. Broken Kernels	5.297	0.2581	3.865	0.8691	1.343	0.9950
k. Test Weight	6.697	0.1528	9.130	0.3314	2.525	0.9606
l. Foreign Material	7.231	0.1242	17.083	0.0693	1.592	0.9911
m. Defects	2.903	0.5741	7.166	0.5189	3.750	0.8790
n. DHV	9.358	0.0528	5.940	0.6540	4.760	0.7829

Pricing Characteristics	Grain Producer Responses: By size of operation Chi-sq	By size of operation OSL[1]	By crop grown Chi-sq	By crop grown OSL[1]
a. Offer grain at a set price and wait until a buyer bids that amount	7.111	0.5247	5.539	0.6987
b. Forward contract grain at a set price and wait until a buyer bids that amount	5.503	0.7027	3.049	0.9312
c. Have grain auctioned to the highest bidder	3.766	0.8766	8.041	0.4295
d. Place a reservation or floor price on your grain	2.454	0.9638	10.791	0.2138
e. Change your reservation or floor price as frequently as you wish	8.668	0.3711	8.812	0.3584
f. Price futures market orders	4.599	0.7994	3.171	0.9231
g. Offer grain to more buyers	9.841	0.2764	2.676	0.9530
Information Services				
a. Improved access to details of the most recent individual trades	3.599	0.8914	6.082	0.6380
b. Improved access to summaries of all trades	12.076	0.1479	7.122	0.5236
c. Improved access to cash price bids from buyers	7.808	0.4465	10.323	0.2431
d. Improved access to forward contract bids from buyers	3.011	0.9336	3.785	0.8760
e. Improved access to other market information:				
1. News: general	10.620	0.2242	4.202	0.8385
commodity	8.131	0.4208	2.354	0.9682

	Grain Producer Responses			
	By size of operation		By crop grown	
	Chi-sq	OSL[1]	Chi-sq	OSL[1]
2. Prices: Local	11.212	0.1900	3.373	0.9088
National	6.262	0.6179	1.806	0.9864
World	5.888	0.6597	0.770	0.9993
Futures	8.657	0.3721	2.959	0.9369
Forecast	5.651	0.6383	6.466	0.5952
3. Currency exchange rates	6.213	0.6234	2.291	0.9708
4. Trade Leads*	9.110	0.3331	6.247	0.6196
5. Transportation Rates	20.400	0.0089	3.537	0.8963
6. USDA reports	7.102	0.5256	3.590	0.8921
7. Weather**	11.278	0.1865	3.727	0.8809
8. Local weather*	10.718	0.2182	2.590	0.9574
9. National weather*	9.215	0.3245	5.884	0.6603
10. World weather*	5.022	0.7552	1.592	0.9911
Descriptive Characteristics				
a. Location (FOB)	4.512	0.8082	3.426	0.9049
b. Delivery conditions	7.357	0.4987	0.521	0.9998
c. Quantity	3.659	0.8865	1.649	0.9899
d. Moisture	1.634	0.9982	1.248	0.9961
e. U.S. Grade	4.496	0.8098	2.072	0.9787
f. Protein	2.411	0.9658	11.339	0.1832
g. Percent oil	10.809	0.2127	3.388	0.9077
h. Heat damage	6.631	0.5769	9.400	0.3097
i. Total damage	4.048	0.8528	3.996	0.8575
j. Broken kernels	4.366	0.8227	5.742	0.6761
k. Test weight	5.334	0.7214	4.624	0.7969

	Grain Producer Responses			
	By size of operation		By crop grown	
	Chi-sq	OSL[1]	Chi-sq	OSL[1]
l. Foreign material	6.033	0.6435	2.401	0.9662
m. Defects	5.294	0.7258	3.954	0.8613
n. DHV	13.286	0.1024	4.673	0.7919
Storage and Transportation Services				
a. Locate available storage for grain	11.643	0.1678	3.319	0.9128
b. Offer grain to elevators for a set storage fee	4.869	0.7714	9.339	0.3145
c. Locate transportation for moving your grain	10.574	0.2270	3.295	0.9145
d. Negotiate freight rates for grain shipping	10.381	0.2393	10.415	0.2371
Operational Characteristics				
a. Market grain knowing that buyer performance is guaranteed	3.362	0.9096	2.466	0.9633
b. Access the trading system from your home	6.830	0.5551	5.531	0.6996
c. Access the trading system from a local agribusiness	5.631	0.6884	3.930	0.8633
d. Send and receive electronic mail	5.688	0.6822	5.217	0.7342
e. Use the computer for other consumer services	12.397	0.1343	10.016	0.2639

* Producer personal interview only.
** Producer mail out survey only.

[1]Observed Significance Level (OSL) is the probability of making an error when you reject the null hypothesis that the respondent groups are not significantly associated with the potential characteristics.

	Feedlot Operator Responses By Size of Operation	
	Chi-sq	OSL[1]
Descriptive Characteristics		
a. Location (FOB)	6.134	0.6322
b. Delivery conditions	2.375	0.6671
c. Quantity	7.563	0.4773
d. Moisture	13.260	0.1032
e. U.S. Grade	7.525	0.2750
f. Protein	8.538	0.3828
g. Time in storage	6.456	0.5962
h. Heat damage	4.421	0.3520
i. Total damage	1.434	0.8382
j. Broken kernels	6.922	0.3282
k. Test weight	6.829	0.3369
l. Foreign material	8.063	0.2335
m. Defects	3.412	0.4914
n. Seller	12.912	0.1149

[1]Observed Significance Level (OSL) is the probability of making an error when you reject the null hypothesis that the respondent groups are not significantly associated with the potential characteristics.

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