Agricultural Economics Miscellaneous Report No. 116 July 1988

Pricing and Marketing Practices for North Dakota Durum and HRS Wheat

1987 Crop Year

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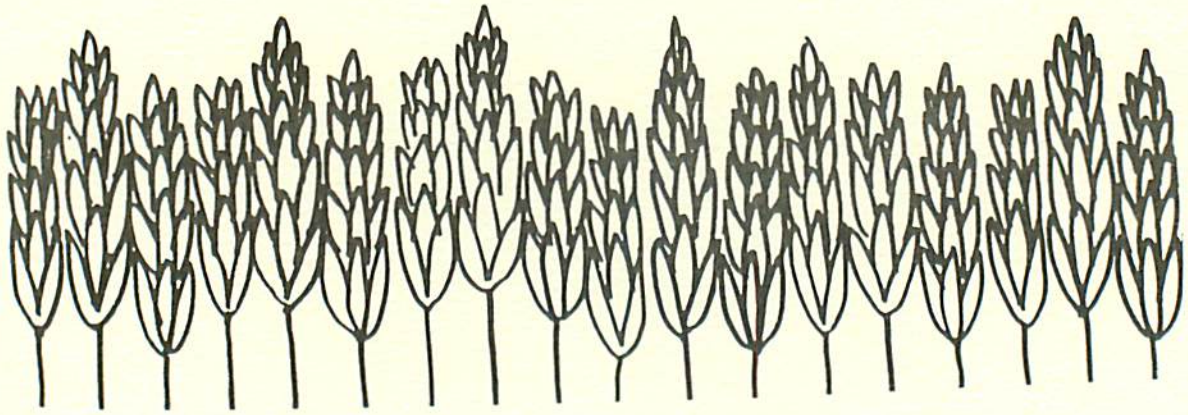

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Preface

The authors would like to acknowledge Dr. Delmer Helgeson, Mr. Timothy Petry, and Dr. Cole Gustafson for reviewing this manuscript and providing helpful suggestions. A special thanks is given to Shelly Swandal for typing several preliminary drafts and the final report.

Financial support for conducting this research was provided by Agricultural Experiment Station Project ND 1360, "Effect of Changes in Transportation on Performance of the U.S. Transportation System."

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Highlights

Throughout the marketing year, cash markets reflect demand and supply conditions for domestic and export use of HRS and durum wheats. Price adjustments are established by the interaction of supply and demand for various quality characteristics.

The purpose of this report is to present the results of an annual survey of country elevator managers in North Dakota. Information on premiums and discounts of durum and HRS wheat, selected organization and operational data, and information on the general characteristics of the responding elevators were collected and presented.

PRICING AND MARKETING PRACTICES FOR NORTH DAKOTA DURUM AND HRS WHEAT 1987 CROP YEAR

Bradley B. Clow and William W. Wilson*

Introduction

Throughout the marketing year, cash markets reflect demand and supply conditions for domestic and export use of HRS and durum wheats. Price adjustments, hereafter referred to as premiums and discounts, are established by the interaction of supply and demand for various quality characteristics. Merchandisers and country elevators communicate these premiums and discounts, for each factor, from markets to producers.

The purpose of this report is to present the results of an annual survey of country elevator managers in North Dakota. Information on premiums and discounts of durum and HRS wheat, selected organization, and operational data, and information on the general characteristics of the responding elevators were collected and presented.

Similar studies on the pricing adjustments for durum and HRS wheat were conducted for the 1984, 1985 and 1986 crop years. The 1984 survey was more comprehensive for pricing and marketing practices than the more recent surveys, which were very similar in structure. Reports written from 1984, 1985, and 1986 surveys are available from the Department of Agricultural Economics, North Dakota State University. The results of the 1987 survey with comparisons to 1985 and 1986 is the focus of this study.

General Characteristics of Participating Elevators

A total of 151 elevators participated in the 1987 survey. The participation rate was 30 percent for 1987, compared to 33 percent and 41 percent for 1986 and 1985, respectively. Location, organizational structure, load-out capacity, distance to competition, storage capacity, board prices of durum and HRS wheat, and commission companies and track buyers used varied with participating elevators. A breakdown of general characteristics of elevators participating is presented in Figure 1 and Tables 1-7. Throughout this report, reference is made to tables and figures containing data from the survey. These tables are located in Appendix A, and the figures are in Appendix B. Crop Reporting Districts (CRDs) were used to divide the responding elevators into different state locations. The market shares among commission companies and trackbuyers were similar to previous years, with Harvest States Cooperatives having the dominant market share. Commission companies and track buyers varied by participating elevators in different regions. A breakdown of different grain buyers by region is presented in Table 8. Harvest States Cooperatives was the largest buyer of durum and HRS wheat in the majority of CRDs. Atwood-Larson, the second largest buyer,

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dominated in CRDs 2 and 8, with Benson-Quinn and Kellogg following as the third largest buyers.

Legal ownership varied by participating elevators; 101 cooperatives and 50 private firms participated in the survey. Within the cooperatives in North Dakota, it was found that Harvest States was the largest buyer of durum and HRS wheat followed by Benson-Quinn and Atwood-Larson, respectively (Table 9).

Atwood-Larson was the largest buyer of durum and HRS wheat from private firms in North Dakota, and Kellogg was the next largest buyer with Cargill following in third place.

The use of commission companies and track buyers varied by size of elevator (Table 10). Harvest States was the major buyer of durum and HRS wheat from firms with storage capacity ranging from 100,000 to 199,000 and from 400,000 to over 1,000,000 bushels. Kellogg was observed as the major buyer of durum and HRS wheat for firms with storage capacity ranging from 0 to 99,000 bushels.

Premiums and Discounts

Managers were asked to report their base grade price for "No. 1 Hard Amber Durum" and "No. 1 Dark Northern Spring, 14 percent protein." Pricing adjustments for durum and HRS wheat were collected for both grade and nongrade factors. Grade factors that were analyzed in this study were test weight, damaged kernels, foreign material, shrunken and broken kernels, contrasting class, and wheat of other classes. Nongrade determining factors included price adjustments for 14.5 percent moisture durum and HRS wheat, 12 and 16 percent HRS wheat protein, and "amber durum."

The average price adjustments for 1984 to 1987 are presented in Table 12. Most of the price adjustments for 1987 durum and HRS wheat crops averaged higher than those for 1984 to 1986 crop years. All but one price adjustment averaged the same or higher in 1987 than in 1986. The adjustments for 58 lbs. test weight for durum were significantly higher in 1987 (Table 13).

The range between high and low price adjustments indicates that the elevators varied considerably in their pricing adjustments. The frequency distributions given in Figures 2-15 indicate pricing dispersion for each factor. The distribution of responses varied among adjustments for each factor.

Analysis

The price adjustment responses were analyzed for significant differences by location in the state, organizational structure, load-out capacity, distance to competition, and storage capacity. The mean value was calculated

for each factor as a measure for comparison. Price adjustments were found to differ between crop reporting districts (CRD). It was observed that price adjustments for durum were higher in CRD 7 than in all other CRDs. Contributing to this discrepancy is lower production in southwestern North Dakota resulting in less competition for buying durum.

Price adjustments for 12 percent protein HRS wheat price have a wide range of variation (Table 14). It was found that CRD 8 and 9 have a lower discount for 12 percent protein, averaging 25 cents per bushel compared to 45 cents per bushel discount in the other CRDs. This occurrence may be attributed to the demand differential between Pacific Northwest (PNW) and Minneapolis/Duluth markets. Significant regional differences were observed for the discount for 14.5 percent moisture for HRS wheat. Discounts averaged 14.7 cents per bushel in CRD 1 compared to 5.6 to 7.5 cents per bushel in all other regions. Discount variability for wheat of other classes in certain CRDs may be explained by the amount of HRW wheat produced in that CRD. The high discounts discourage farmers from blending wheat of other classes.

An analysis of price adjustments among elevators with private and cooperative organizational structures is presented in Table 15. Two important differences were observed. Noticeable differences in price adjustments for durum were observed in discounts for amber durum, where private firms took a greater discount. Variation also occurred for premiums for 16 percent protein for HRS wheat. In this case, premiums were greater for private firms compared to cooperative firms.

Averages of price adjustments varied among elevators with different load-out capacity (Table 16). A noticeable variation occurred for 5 percent wheat of other classes for HRS wheat. The larger the load-out capacity, the larger the discount, with the exception of 27 to 54-car loading where the discount was 7.5 cents per bushel. Another factor of significant variation was protein premiums and discounts for 16 and 12 percent protein HRS wheat. The larger the load-out capacity, the greater the discounts for 12 percent protein HRS wheat.

For durum and HRS wheat, price adjustments were significant among elevators with selected distances to competition. For durum, firms with competitors more than 6 to 10 miles away had generally lower discounts than firms with closer competitors (Table 17). For HRS wheat, being 6 to 10 miles away from the nearest competitor resulted in lower price adjustments.

Storage capacity of elevators had an influence on price adjustments for durum and HRS wheat (Table 18). For most, no trend was observed; however, firms with larger storage capacity of 300,000 to 399,000 bushels took small discounts for 12 percent protein and paid greater premiums for HRS wheat than all other firms. Protein discounts were greatest for firms with a storage capacity of 100,000 to 199,000 bushels. This firm size also paid lower premiums for 16 percent protein.

Economics of Cleaning Wheat

Managers were asked questions about the economics of cleaning wheat. Of the 151 elevators responding, 150 cleaned wheat prior to shipment. These elevators could clean an average of 1,531 bushels per hour with a range of 200 to 15,000 bushels per hour. At harvest, the managers called incoming wheat clean at an average of 2.7 percent dockage and did not physically clean that wheat. After harvest, incoming wheat was called clean if dockage was less than or equal to 2.0 percent and was not cleaned further. During harvest, wheat was cleaned down to an average 1.1 percent dockage. After harvest, wheat was cleaned down to an average .8 percent dockage.

Managers were also asked whether they changed the method of measuring dockage since the law was changed to measure dockage to the nearest .1 of a percent. It was observed that 60 percent of the managers responding indicated that they changed their dockage deduction policy. From this group, 97 percent of the respondents indicated they deduct dockage to the nearest .1 percent.

The cost of cleaning, price of wheat screenings, dockage level of the wheat, and cost of transportation are the major factors determining the economics of cleaning wheat. The average cleaning cost reported by responding elevator managers was 3.5 cents per bushel. Wheat screenings prices averaged $9.90 per ton (Table 20). Table 20 contains the average high and low estimated cleaning cost and wheat screening prices for 1986 and 1987. Screening prices have decreased from $16.08 per ton in 1986 to $9.90 per ton in 1987. Average cleaning costs were 3.5 cents per bushel in 1987 compared to 4.0 cents per bushel in 1986. Therefore, if transportation costs and dockage levels remain the same, cleaning wheat would be less profitable in 1987 than in 1986.

The economics of cleaning wheat were examined by using selected cleaning costs and price for wheat screenings. A margin from cleaning was calculated using the following equation:

$$\text{Cleaning Margin} = (W)(D)(S + T) - (CW)$$

where W = the amount of wheat in lbs.
D = the percentage of dockage in the wheat
S = the price received for wheat screening per lb.
T = the cost of transportation from the elevator to the destination market, and
C = the cost of cleaning wheat per lb.

Table 21 contains results of a sensitivity analysis which shows how much screening values and transportation savings can influence the economics of cleaning. Dockage is rounded to the nearest 1 percent. The figures in Table 21 are gross averages and should not be used for managerial decisions. It is shown that profitability of cleaning wheat fluctuates with cleaning costs. A one-cent decrease from 3 cents to 2 centsincreases profitability for

cleaning wheat at lower incoming dockage levels. Therefore, it is shown that profitability of cleaning wheat depends on the transportation costs, cleaning costs, and the price for wheat screening, each of which varies by elevator.

Summary and Conclusions

Elevators responding to the survey varied considerably by location in the state, organizational structure, load-out capacity, distance to competition, storage capacity, board price for durum and HRS wheat, and commission companies and track buyers used. Price adjustments varied throughout the state, and significant differences were identified. The major source of price variability for durum in 1987 came from the discount for test weight. Nongrade factors also had a significant influence on price levels. Protein premiums for 1987 were different in the southeastern portion of the state. Premium and discount averages used in 1987 were higher than price adjustment averages for 1984, 1985, and 1986 crop years.

Issues relating to measuring dockage and economics of cleaning wheat were also examined in the study. It was found that 60 percent of the managers changed their policy toward measuring dockage. From those responding, 97 percent now measure dockage to the nearest .1 percent. Using selected responses, the margin for cleaning wheat was calculated. The decrease in average screening prices in 1987 more than offset the decrease in average cleaning costs. As a result, cleaning wheat was less profitable in 1987 than in 1986.

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Appendix A

TABLE 1. NUMBER AND PERCENTAGE OF RESPONSES FROM NINE REGIONS ACROSS NORTH DAKOTA

Region	Number of Elevators Receiving Questionnaires	Number of Elevators Responding	Percentage Responding
1. Northwest	64	22	34
2. North Central	44	9	21
3. Northeast	111	36	32
4. West Central	24	8	33
5. Central	50	12	24
6. East Central	82	23	28
7. Southwest	31	11	35
8. South Central	33	12	36
9. Southeast	73	18	25
Total	512	151	30

SOURCE: Question 2.

TABLE 2. ORGANIZATIONAL STRUCTURE OF RESPONDING ELEVATORS

Types	Number	Percentage
Locally owned cooperatives	92	61
Harvest states line elevator	9	6
Locally owned private elevator	28	18
Line elevator of large private company	13	9
Other	9	6
Total	151	100

TABLE 3. LOAD-OUT CAPACITY OF RESPONDING ELEVATORS

Load-Out Capacity	Number	Percentage
6 or less cars/day	27	19
7 - 26 cars/day	86	59
27 - 54 cars/day	20	14
More than 54 cars/day	12	8
Total	145	100

SOURCE: Question 4.

TABLE 4. DISTANCE TO NEAREST COMPETITION OF RESPONDING ELEVATORS

Distance to Competition	Number	Percentage
Less than 5 miles	50	33
6 - 10 miles	74	49
More than 10 miles	27	18
Total	151	100

SOURCE: Question 5.

TABLE 5. STORAGE CAPACITY OF RESPONDING ELEVATORS

Storage Capacity	Number	Percentage
Less than 100,000 bushels	8	5
100,000 to 199,000 bushels	30	20
200,000 to 299,000 bushels	24	16
300,000 to 399,000 bushels	20	13
400,000 to 699,000 bushels	35	23
700,000 to 999,000 bushels	18	12
Over 1,000,000 bushels	16	11
Total	151	100

SOURCE: Question 6.

TABLE 6. AVERAGE BOARD PRICE FOR NO. 1 HARD AMBER DURUM AND NO. 1 DNS 14 PERCENT PROTEIN HRS WHEAT AMONG RESPONDING ELEVATORS IN EACH REGION, NOVEMBER 9, 1987

Region	Average Durum Price	Average HRS Wheat Price
1. Northwest	3.35	2.41
2. North Central	3.32	2.42
3. Northeast	3.46	2.47
4. West Central	3.41	2.42
5. Central	3.36	2.44
6. East Central	3.34	2.58
7. Southwest	3.24	2.44
8. South Central	3.29	2.44
9. Southeast	3.70	2.54
State	3.41	2.48

SOURCE: Question 15 and 17.

TABLE 7. MARKET SHARE OF COMMISSION COMPANIES AND TRACK BUYERS BY RESPONDING ELEVATORS FOR DURUM AND HRS WHEAT (FALL 1987)

Company	Durum	HRS Wheat
	----- percent -----	
Harvest States	32	31
Atwood-Larson	19	15
Benson-Quinn	13	14
Kellogg	12	12
Cargill	8	8
Peavey	2	5
Continental	2	3
International Multifoods	2	4
North Dakota State Mill	3	1
Others	7	7
Total	100	100

SOURCE: Question 7.

Note: Percentages shown are not weighted by the amount of durum and HRS wheat handled by each elevator and thus indicate the average among the elevators, not the amount of durum and HRS wheat handled by each company in North Dakota.

TABLE 8. MARKET SHARE OF COMMISSION COMPANIES AND TRACK BUYERS BY REGION FROM RESPONDING ELEVATORS FOR DURUM AND HRS WHEAT (FALL 1987)

Commodity (Base Grade)	Company	Region 1	2	3	4	5	6	7	8	9
		percent								
Durum	Harvest States	32	31	43	39	25	12	61	18	31
	Atwood-Larson	19	46	11	25	7	14	16	44	19
	Benson Quinn	7	0	25	14	18	6	4	11	14
	Kellogg	16	0	4	18	15	9	0	22	22
	Cargill	10	19	2	0	14	25	0	0	1
	Peavey	4	2	0	0	5	4	2	4	1
	Continental	1	2	5	1	1	0	1	0	0
	IMF	1	0	2	0	3	9	0	0	0
	Others	10	0	8	3	12	21	16	1	12
	Total	100	100	100	100	100	100	100	100	100
HRS	Harvest States	35	23	39	38	23	18	49	24	30
	Atwood-Larson	18	28	13	22	0	6	10	41	17
	Benson Quinn	0	0	24	25	17	13	16	1	17
	Kellogg	10	10	7	10	14	10	9	26	16
	Cargill	11	18	1	3	17	18	3	0	1
	Peavey	4	1	1	0	13	7	2	4	9
	Continental	8	0	1	0	3	3	2	0	4
	IMF	1	0	6	0	0	12	8	0	0
	Others	13	20	8	2	13	13	1	5	6
	Total	100	100	100	100	100	100	100	100	100

TABLE 9. MARKET SHARE OF COMMISSION COMPANIES AND TRACK BUYERS BY ORGANIZATION FROM RESPONDING ELEVATOR FOR DURUM AND HRS WHEAT (FALL 1987)

Commodity (Base Grade)	Company	Private	Cooperative
		percent	
Durum	Harvest States	0	45
	Atwood-Larson	28	15
	Benson Quinn	7	16
	Kellogg	20	8
	Cargill	17	4
	Peavey	5	2
	Continental	5	1
	IMF	7	0
	Others	11	9
	Total	100	100
HRS	Harvest States	0	43
	Atwood-Larson	22	13
	Benson Quinn	9	16
	Kellogg	21	8
	Cargill	16	4
	Peavey	11	2
	Continental	6	1
	IMF	8	2
	Others	7	11
	Total	100	100

TABLE 10. MARKET SHARE OF COMMISSION COMPANIES AND TRACK BUYERS BY SIZE OF ELEVATORS FOR DURUM AND HRS WHEAT (FALL 1987)

Commodity (Base Grade)	Company	Elevator Size (By Bushels) 0 To 99,000	100,000 To 199,000	200,000 To 299,000	300,000 To 399,000	400,000 To 1,000,000	Over 1,000,000
		percent					
Durum	Harvest States	0	37	27	19	37	34
	Atwood-Larson	16	22	28	21	16	13
	Benson Quinn	0	9	6	23	17	8
	Kellogg	54	5	25	17	7	6
	Cargill	6	7	3	10	7	18
	Peavey	2	0	6	1	2	5
	Continental	4	1	0	9	1	2
	IMF	10	5	1	0	2	0
	Others	8	14	4	0	11	14
	Total	100	100	100	100	100	100
HRS	Harvest States	0	33	27	17	37	33
	Atwood-Larson	0	17	21	22	12	10
	Benson Quinn	25	7	10	23	16	10
	Kellogg	47	9	21	23	4	7
	Cargill	2	7	5	7	6	23
	Peavey	4	2	4	2	6	7
	Continental	3	6	0	0	3	2
	IMF	15	7	5	0	3	0
	Others	4	12	7	6	13	8
	Total	100	100	100	100	100	100

TABLE 11. MARKET SHARE COMMISSION COMPANIES AND TRACK BUYER BY LOAD-OUT CAPACITY FROM RESPONDING ELEVATOR FOR DURUM AND HRS WHEAT (FALL 1987)

Commodity (Base Grade)	Company	Load-out Capacity: Less Than 6 Cars	7 To 26 Cars	27 To 54 Cars	Greater Than 54 Cars
		percent			
Durum	Harvest States	14	34	41	37
	Atwood-Larson	22	23	10	4
	Benson Quinn	16	15	4	17
	Kellogg	25	10	12	1
	Cargill	5	5	22	12
	Peavey	1	3	2	2
	Continental	0	1	6	2
	IMF	6	1	0	4
	Others	11	8	3	21
	Total*	100	100	100	100
HRS	Harvest States	16	33	39	42
	Atwood-Larson	14	19	6	9
	Benson Quinn	16	16	2	17
	Kellogg	29	8	8	0
	Cargill	4	4	28	6
	Peavey	2	5	5	6
	Continental	2	2	6	3
	IMF	11	3	0	1
	Others	6	10	6	16
	Total*	100	100	100	100

*May not add to 100 due to rounding.

TABLE 12. AVERAGE PRICE ADJUSTMENTS FOR EACH FACTOR AMONG RESPONDING NORTH DAKOTA COUNTRY ELEVATORS (FALL OF 1984, 1985, 1986, and 1987)

Commodity (Base Grade)	Factor	1984 Average	1985 Average	1986 Average	1987 Average
		¢/bu.			
Durum	58 lbs. test weight	-2.2	-2.2	-2.7	-7.0
#1 HAD	14.5% moisture	-6.0	-7.6	-7.2	-7.3
	Amber durum	-5.7	-16.7	-21.0	-22.6
	4% damaged kernels	-6.0	-6.9	-8.4	-8.9
	1% foreign material	-2.8	-1.9	-1.9	-2.4
	5% shrunken and broken kernels	-6.6	-3.9	-5.0	-4.8
	2% contrasting classes	-2.0	-4.4	-4.8	-5.0
	5% wheat of other classes	--	-9.9	-11.7	-11.8
HRS	57 lbs. test weight	-1.9	-1.8	-2.9	-3.2
#1 DNS	14.5% moisture	-5.9	-6.8	-6.5	-7.5
14% Protein	16% protein	41.0	63.4	62.6	86.8
	12% protein	-38.0	-67.4	-43.9	-38.5
	4% damaged kernels	-2.0	-6.6	-8.9	-8.4
	1% foreign material	-1.4	-1.3	-1.7	-2.0
	5% shrunken and broken kernels	-2.2	-3.0	-4.2	-4.1
	2% contrasting classes	-1.6	-3.2	-3.5	-3.7
	5% wheat of other classes	--	-7.0	-8.6	-9.1

SOURCE: Questions 16 and 18.

TABLE 13. QUALITY OF 1986 AND 1987 DURUM AND HRS WHEAT CROPS

Commodity (Base Grade)	Factor	1986 Average Value	1987 Average Value
Durum	Test weight	59.3 lbs.	58.5
	Moisture %	12.4	12.2
	Grade	2 HAD	2 HAD
	Shrunken and broken kernels %	1.2	.9
	Foreign material %	0.1	.2
	Damaged kernels %	0.8	1.5
	Contrasting classes %	0.4	.6
HRS	Test weight	58.7 lbs.	58.9
	Moisture %	12.4	12.2
	Protein %	14.6	14.9
	Shrunken and broken kernels %	1.6	1.3
	Foreign material %	0.0	.2
	Damaged kernels %	0.6	.6
	Contrasting classes %	0.0	.0

SOURCE: 1986 and 1987 durum wheat and HRS wheat quality reports, Department of Food Science and Cereal Technology, North Dakota State University, Fargo, ND.

TABLE 14. PRICE ADJUSTMENT AVERAGES FOR DURUM AND HRS WHEAT AMONG ELEVATORS OF SPECIFIED REGIONS IN NORTH DAKOTA (FALL 1987)

Commodity (Base Grade)	Factor	Region 1	2	3	4	5	6	7	8	9
		¢/bu.								
Durum	58 lbs. test weight	- 7.7	- 8.3	- 6.9	- 7.3	- 7.0	- 8.0	- 6.0	- 4.4	- 5.9
#1 HAD	14.5% moisture	- 8.8	- 7.2	- 7.1	- 7.9	- 8.2	- 7.1	- 6.3	- 6.0	- 5.9
	Amber durum	-21.1	-30.5	-21.1	-25.0	-23.0	-22.2	-33.8	-26.3	-16.2
	4% damaged kernels	- 9.9	- 7.8	- 8.4	-10.9	- 7.7	- 9.6	-10.5	- 9.6	- 7.4
	1% foreign material	- 2.5	- 1.3	- 2.5	- .5	- 3.5	- 2.8	- 2.8	- 2.7	- 1.6
	5% shrunken and broken kernels	- 3.3	- 4.3	- 5.4	- 6.7	- 5.2	- 3.5	- 7.8	- 6.3	- 4.4
	2% contrasting classes	- 4.5	- 5.2	- 4.0	- 4.3	- 6.3	- 5.4	- 6.8	- 7.3	- 5.3
	5% wheat of other classes	- 9.8	-13.0	-11.5	-13.1	-12.0	-11.7	-15.8	-16.0	-11.3
HRS	57 lbs. test weight	- 4.3	- 3.6	- 3.7	- 2.6	- 2.7	- 2.8	- 2.3	- 2.5	- 2.5
#1 DNS	14.5% moisture	-14.7	- 6.4	- 6.7	- 6.4	- 7.5	- 5.6	- 5.7	- 6.0	- 6.6
14% Protein	16% protein	+85.6	+81.6	+87.8	+81.5	+81.4	+85.0	+87.1	+94.8	+91.5
	12% protein	-51.8	-37.9	-32.4	-43.1	-46.5	-45.9	-43.8	-23.2	-26.8
	4% damaged kernels	- 8.8	- 9.0	- 8.4	-10.6	- 8.3	- 8.3	- 8.3	- 7.6	- 7.8
	1% foreign material	- 2.7	- 1.1	- 2.0	- .8	- 2.9	- 2.1	- 2.2	- 1.4	- 1.6
	5% shrunken and broken kernels	- 3.5	- 3.3	- 4.2	- 6.8	- 4.9	- 4.5	- 3.4	- 4.0	- 2.9
	2% contrasting classes	- 3.8	- 3.0	- 3.8	- 4.4	- 3.6	- 3.7	- 3.3	- 3.7	- 3.4
	5% wheat of other classes	- 8.3	- 9.3	- 9.3	-15.0	- 7.6	- 8.0	-10.0	- 8.9	- 8.5

SOURCE: Questions 2, 16, and 18.

TABLE 15. PRICE ADJUSTMENT AVERAGES FOR DURUM AND HRS WHEAT AMONG SELECTED TYPES OF ELEVATOR STRUCTURE ORGANIZATIONS (FALL 1987)

Commodity (Base Grade)	Factor	Cooperative	Private
		¢/bu.	
Durum	58 lbs. test weight	-7.1	-6.8
#1 HAD	14.5% moisture	-7.7	-6.5
	Amber durum	-21.1	-26.1
	4% damaged kernels	-8.9	-8.9
	1% foreign material	-2.3	-2.6
	5% shrunken and broken kernels	-5.1	-4.2
	2% contrasting classes	-5.4	-4.3
	5% wheat of other classes	-12.1	-11.0
HRS	57 lbs. test weight	-3.1	-3.2
#1 DNS	14.5% moisture	-8.0	-6.2
14% Protein	16% protein	+84.3	+92.2
	12% protein	-39.3	-36.6
	4% damaged kernels	-8.5	+8.3
	1% foreign material	-2.0	-2.0
	5% shrunken and broken kernels	-4.1	-3.9
	2% contrasting classes	-4.0	-2.9
	5% wheat of other classes	-9.4	-8.6

TABLE 16. PRICE ADJUSTMENT AVERAGES FOR DURUM AND HRS WHEAT AMONG ELEVATORS WITH SELECTED LOAD-OUT CAPACITIES (FALL 1987)

Commodity (Base Grade)	Factor	Load-out Capacity: Less Than 6 Cars	7 To 26 Cars	27 To 54 Cars	Greater Than 54 Cars
Durum	58 lbs. test weight	- 6.7	- 6.6	- 8.6	- 7.5
#1 HAD	14.5% moisture	- 5.8	- 7.0	- 8.7	-10.8
	Amber durum	-23.5	-22.2	-23.2	-22.9
	4% damaged kernels	- 9.3	- 8.7	- 9.5	- 9.4
	1% foreign material	- 1.8	- 2.6	- 2.3	- 2.4
	5% shrunken and broken kernels	- 3.0	- 5.3	- 5.2	- 4.4
	2% contrasting classes	- 5.6	- 5.1	- 3.7	- 5.8
	5% wheat of other classes	-12.6	-11.5	-11.9	-11.6
HRS	57 lbs. test weight	- 2.5	- 3.5	- 2.8	- 2.8
#1 DNS	14.5% moisture	- 5.5	- 8.0	- 7.5	- 9.4
14% Protein	16% protein	+84.4	+87.4	+86.8	+87.4
	12% protein	-35.6	-37.4	-45.8	-40.4
	4% damaged kernels	- 8.0	- 8.4	- 9.4	- 8.2
	1% foreign material	- 1.9	- 1.9	- 1.8	- 2.8
	5% shrunken and broken kernels	- 2.2	- 4.6	- 4.0	- 4.1
	2% contrasting classes	- 3.1	- 4.1	- 2.2	- 4.3
	5% wheat of other classes	- 8.9	- 9.5	- 7.5	-10.1

SOURCE: Questions 4, 16, and 18.

TABLE 17. PRICE ADJUSTMENT AVERAGES FOR DURUM AND HRS WHEAT AMONG ELEVATORS WITH SELECTED DISTANCES TO NEAREST COMPETITION (FALL 1987)

Commodity (Base Grade)	Factor	Less Than 5 Miles	6 To 10 Miles	Greater Than 10 Miles
		¢/bu.		
Durum	58 lbs. test weight	-6.2	-7.2	-7.7
#1 HAD	14.5% moisture	-7.4	-7.1	-7.8
	Amber durum	-24.8	-20.3	-25.8
	4% damaged kernels	-9.4	-8.6	-9.3
	1% foreign material	-2.6	-2.2	-2.5
	5% shrunken and broken kernels	-3.7	-4.9	-6.2
	2% contrasting classes	-4.9	-5.0	-5.5
	5% wheat of other classes	-12.4	-11.4	-12.0
HRS	57 lbs. test weight	-2.6	-3.5	-3.2
#1 DNS	14.5% moisture	-6.8	-8.0	-7.5
14% Protein	16% protein	+90.0	+85.7	+83.9
	12% protein	-41.7	-35.2	-42.1
	4% damaged kernels	-8.4	-8.7	-7.7
	1% foreign material	-2.1	-2.0	-1.6
	5% shrunken and broken kernels	-3.5	-4.1	-4.8
	2% contrasting classes	-3.6	-3.6	-3.8
	5% wheat of other classes	-8.5	-8.8	-11.2

SOURCE: Questions 5, 16, and 18.

TABLE 18. PRICE ADJUSTMENT AVERAGES FOR DURUM AND HRS WHEAT AMONG ELEVATORS WITH SELECTED STORAGE CAPACITIES (FALL 1987)

Commodity (Base Grade)	Factor	Bushels: Less Than 0 To 100,000	100,000 To 199,000	200,000 To 299,000	300,000 To 399,000	400,000 To 1,000,000	Over 1,000,000
		¢/bu.					
Durum #1 HAD	58 lbs. test weight	- 4.7	- 7.1	- 8.3	- 6.2	- 6.6	- 8.1
	14.5% moisture	- 7.5	- 6.9	- 8.1	- 5.4	- 7.4	- 8.3
	Amber durum	-20.5	-22.4	-21.7	-26.3	-22.1	-23.4
	4% damaged kernels	- 9.5	- 9.0	- 9.6	- 7.7	- 8.7	- 9.4
	1% foreign material	- 1.5	- 2.6	- 2.2	- 3.0	- 1.9	- 3.4
	5% shrunken and broken kernels	- 3.0	- 4.0	- 4.6	- 6.4	- 5.6	- 3.5
	2% contrasting classes	- 3.5	- 6.4	- 5.9	- 4.2	- 4.9	- 4.4
	5% wheat of other classes	-10.2	-13.0	-12.6	- 8.2	-11.7	-11.9
HRS #1 DNS 14% Protein	57 lbs. test weight	- 2.8	- 3.8	- 3.9	- 2.4	- 3.0	- 2.6
	14.5% moisture	- 6.2	- 7.2	- 7.6	- 4.4	- 8.9	- 7.9
	16% protein	+91.7	+80.3	+91.6	+92.2	+86.1	+85.0
	12% protein	-32.5	-44.4	-39.5	-29.9	-38.3	-41.3
	4% damaged kernels	- 8.2	- 8.7	- 8.6	- 7.4	- 8.4	- 9.3
	1% foreign material	- .8	- 2.2	- 2.4	- 1.5	- 1.8	- 2.5
	5% shrunken and broken kernels	- 1.8	- 3.2	- 4.8	- 4.2	- 4.6	- 4.0
	2% contrasting classes	- 2.5	- 3.7	- 4.6	- 3.1	- 3.9	- 2.8
	5% wheat of other classes	- 8.2	- 9.9	-12.5	- 5.8	- 9.3	- 7.1

SOURCE: Questions 6, 16, and 18.

TABLE 19. PRICE ADJUSTMENT AVERAGES FOR DURUM AND HRS WHEAT AMONG EASTERN AND WESTERN NORTH DAKOTA ELEVATORS WITH HIGH AND LOW BOARD PRICES (FALL 1987)

Commodity	Location	Factor	Low Price	High Price
			-------- ¢/bu. --------	
Durum	East	58 lbs. test weight	0.0	20
		14.5% moisture	0.0	14
		Amber durum	2.0	50
		4% damaged kernels	3.0	20
		1% foreign material	0.0	10
		5% shrunken and broken kernels	0.0	15
		2% contrasting classes	1.0	20
		5% wheat of other classes	0.0	25
	West	58 lbs. test weight	0.0	20
		14.5% moisture	0.0	20
		Amber durum	5.0	100
		4% damaged kernels	3.0	20
		1% foreign material	0.0	10
		5% shrunken and broken kernels	0.0	15
		2% contrasting classes	0.0	15
		5% wheat of other classes	0.0	25
HRS	East	57 lbs. test weight	0.0	24
		14.5% moisture	0.0	20
		16% protein	4.0	131
		12% protein	1.0	60
		4% damaged kernels	0.0	20
		1% foreign material	0.0	10
		5% shrunken and broken kernels	0.0	15
		2% contrasting classes	0.0	12
		5% wheat of other classes	0.0	25
	West	57 lbs. test weight	0.0	26
		14.5% moisture	0.0	117
		16% protein	0.0	130
		12% protein	0.0	112
		4% damaged kernels	0.0	20
		1% foreign material	0.0	10
		5% shrunken and broken kernels	0.0	15
		2% contrasting classes	0.0	10
		5% wheat of other classes	0.0	25

TABLE 20. AVERAGE, HIGH, AND LOW CLEANING COSTS AND WHEAT SCREENING PRICES FOR 1986 AND 1987

Item	1986			1987		
	Average	High	Low	Average	High	Low
	¢/bu.					
Cleaning Costs	4.0	25.00	0.0	3.5	20.00	0.0
	$/ton					
Prices received	16.08	45.00	0.0	9.90	30.00	0.0

SOURCE: Questions 12 and 14.

TABLE 21. ECONOMICS OF CLEANING WHEAT WITH VARIOUS SPECIFIED CLEANING COSTS, SCREENING PRICES, AND INCOMING DOCKAGE LEVELS AT A TRANSPORTATION COST OF $.60/BU.

Incoming Dockage Levels	Net Profit on 50,000 lb.					
	Price Received With Cleaning Cost of 3¢/Bu.			Price Received With Cleaning Cost of 4¢/Bu.		
	screening value per lb.					
	.015	.01	.005	.015	.01	.005
5	37.50	25.00	12.50	29.17	16.67	4.17
4	25.00	15.00	5.00	16.67	6.67	(3.33)
3	12.50	5.00	(2.50)	4.17	(3.33)	(10.83)
2	0.0	(5.00)	(10.00)	(8.33)	(13.33)	(18.33)
1	(12.50)	(15.00)	(17.50)	(20.83)	(23.33)	(25.83)

(W) (D) (S + T) - (CW) = net profit from cleaning

where

W = amount of wheat in lbs.

D = % of dockage in the wheat

S = price received for wheat screening per lb.

T = cost of transportation from the elevator to the destination market, and

C = cost of cleaning wheat per lb.

Appendix B

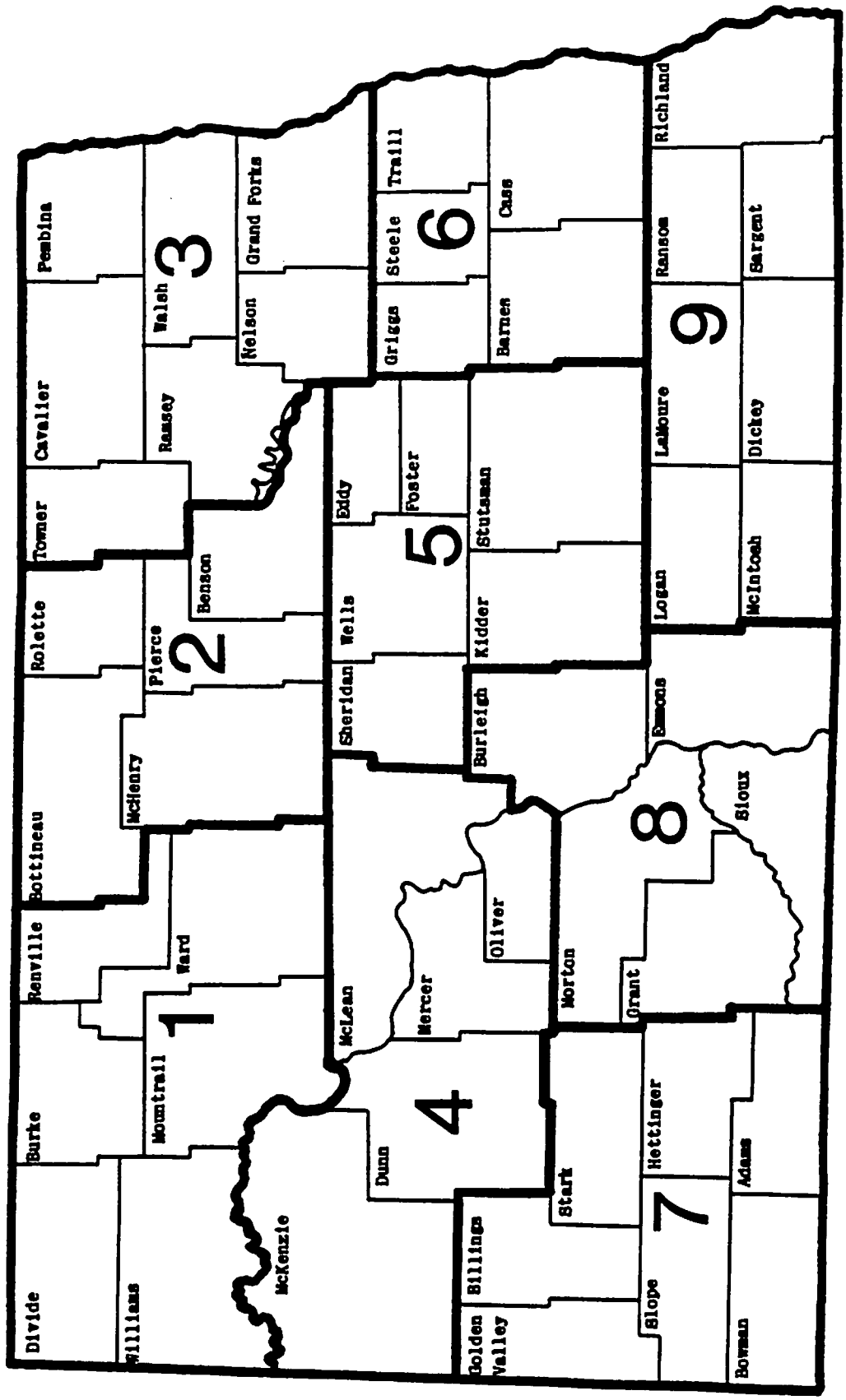
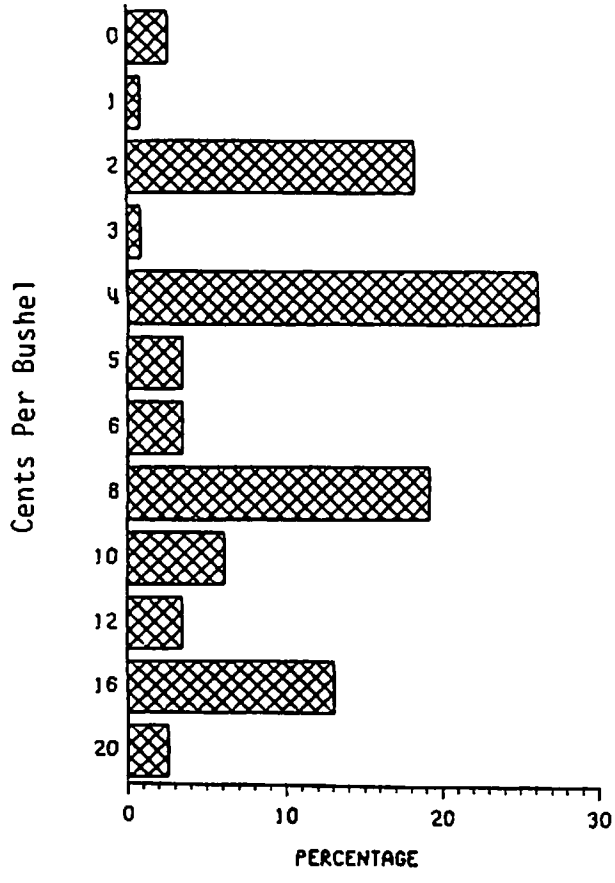
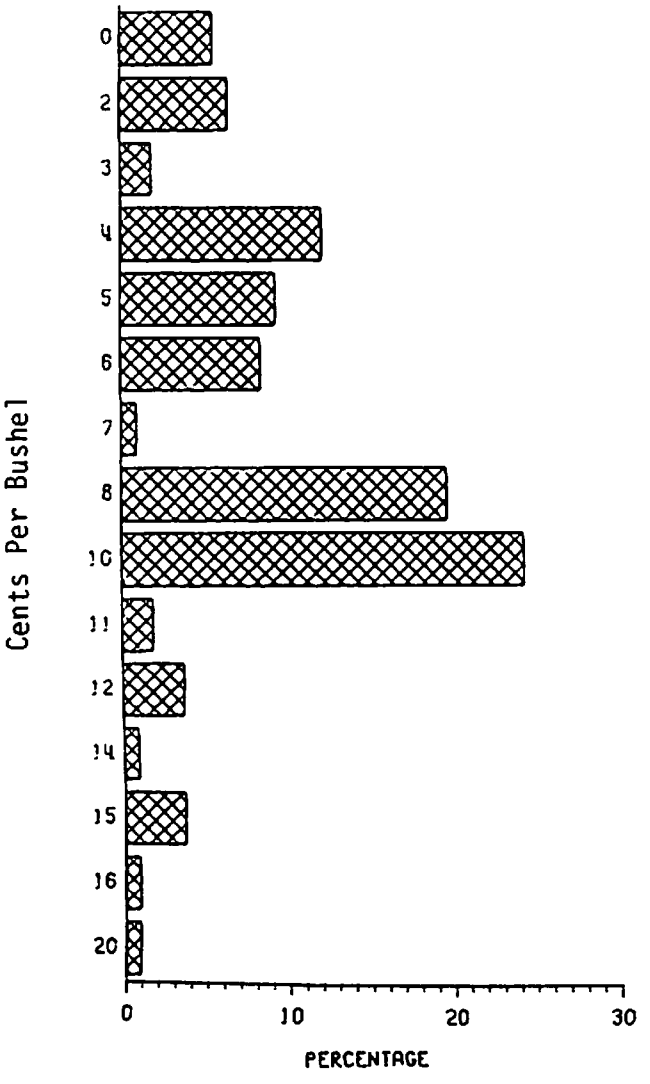


Figure 1. Nine Regions Used to Divide Responding Elevators by Location in the State



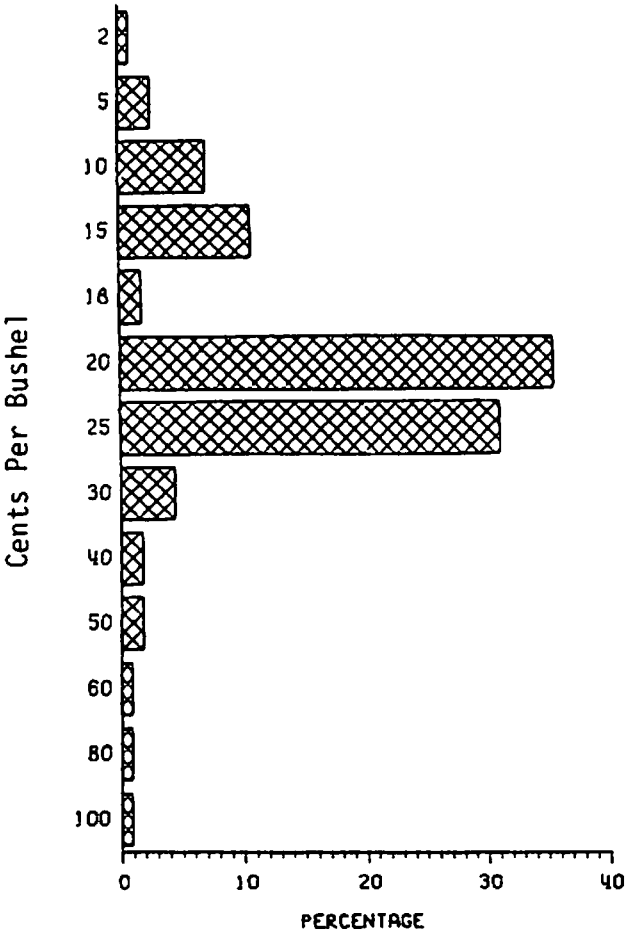
	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
0	3	3	2.61	2.61
1	1	4	0.87	3.48
2	21	25	18.26	21.74
3	1	26	0.87	22.61
4	30	56	26.09	48.70
5	4	60	3.48	52.17
6	4	64	3.48	55.65
8	22	86	19.13	74.78
10	7	93	6.09	80.87
12	4	97	3.48	84.35
16	15	112	13.04	97.39
20	3	115	2.61	100.00

Figure 2. Frequency of Test Weight Discounts for 58-lb. Durum Among Selected Country Elevators in North Dakota



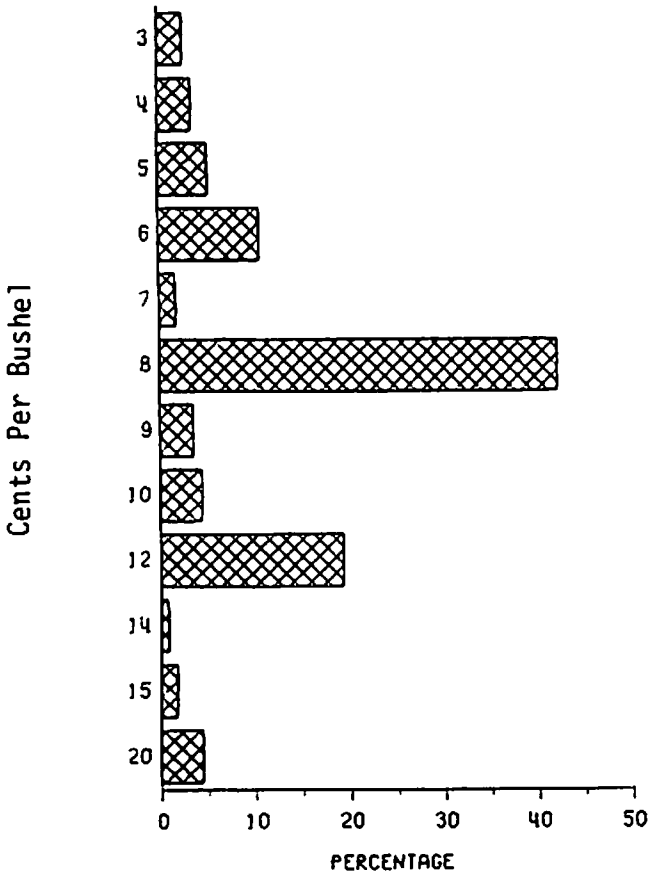
	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
0	6	6	5.56	5.56
2	7	13	6.48	12.04
3	2	15	1.85	13.89
4	13	28	12.04	25.93
5	10	38	9.26	35.19
6	9	47	8.33	43.52
7	1	48	0.93	44.44
8	21	69	19.44	63.89
10	26	95	24.07	87.96
11	2	97	1.85	89.81
12	4	101	3.70	93.52
14	1	102	0.93	94.44
15	4	106	3.70	98.15
16	1	107	0.93	99.07
20	1	108	0.93	100.00

Figure 3. Frequency of Moisture Discounts for 14.5 Percent Moisture Durum Among Selected Country Elevators in North Dakota



	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
2	1	1	0.88	0.88
5	3	4	2.65	3.54
10	8	12	7.08	10.62
15	12	24	10.62	21.24
18	2	26	1.77	23.01
20	40	66	35.40	58.41
25	35	101	30.97	89.38
30	5	106	4.42	93.81
40	2	108	1.77	95.58
50	2	110	1.77	97.35
60	1	111	0.88	98.23
80	1	112	0.88	99.12
100	1	113	0.88	100.00

Figure 4. Frequency of Color Discounts for Durum (Amber Durum) Among Selected Country Elevators in North Dakota



	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
3	3	3	2.63	2.63
4	4	7	3.51	6.14
5	6	13	5.26	11.40
6	12	25	10.53	21.93
7	2	27	1.75	23.68
8	48	75	42.11	65.79
9	4	79	3.51	69.30
10	5	84	4.39	73.68
12	22	106	19.30	92.98
14	1	107	0.88	93.86
15	2	109	1.75	95.61
20	5	114	4.39	100.00

Figure 5. Frequency of Damage Discounts for 4 Percent Total Damage Durum Among Selected Country Elevators in North Dakota

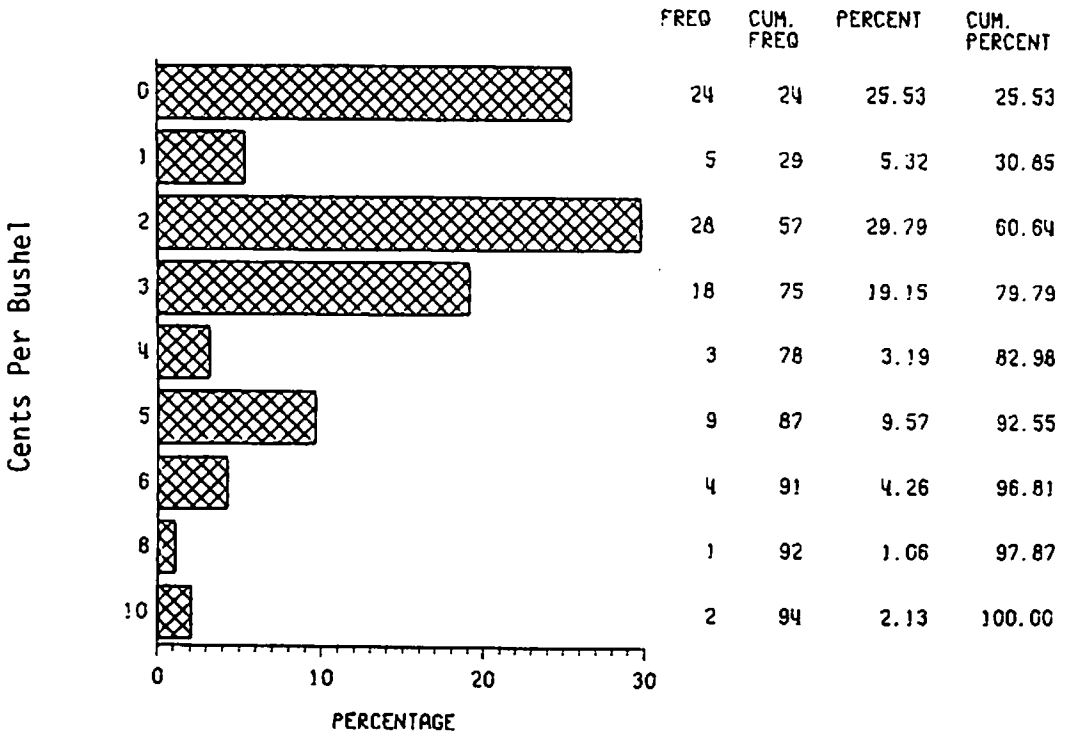
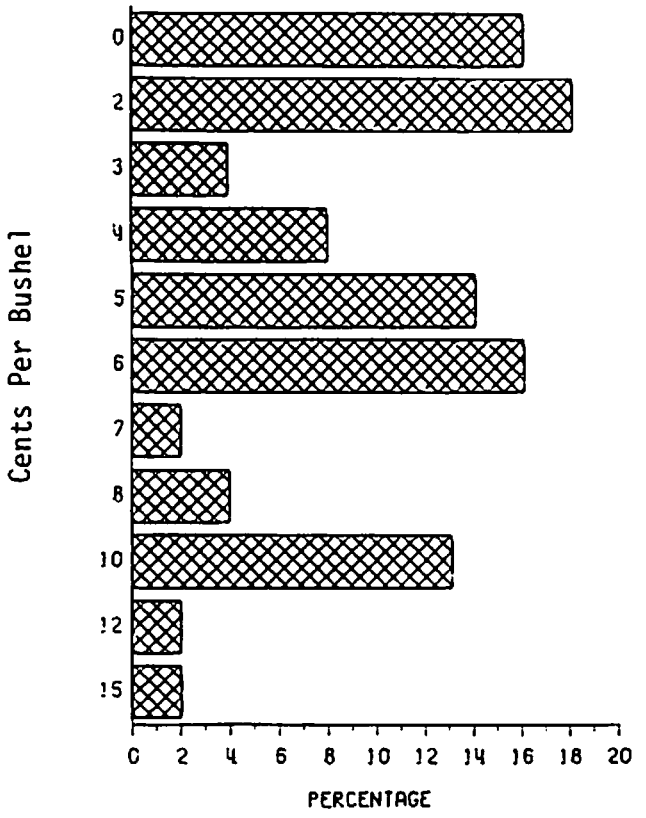
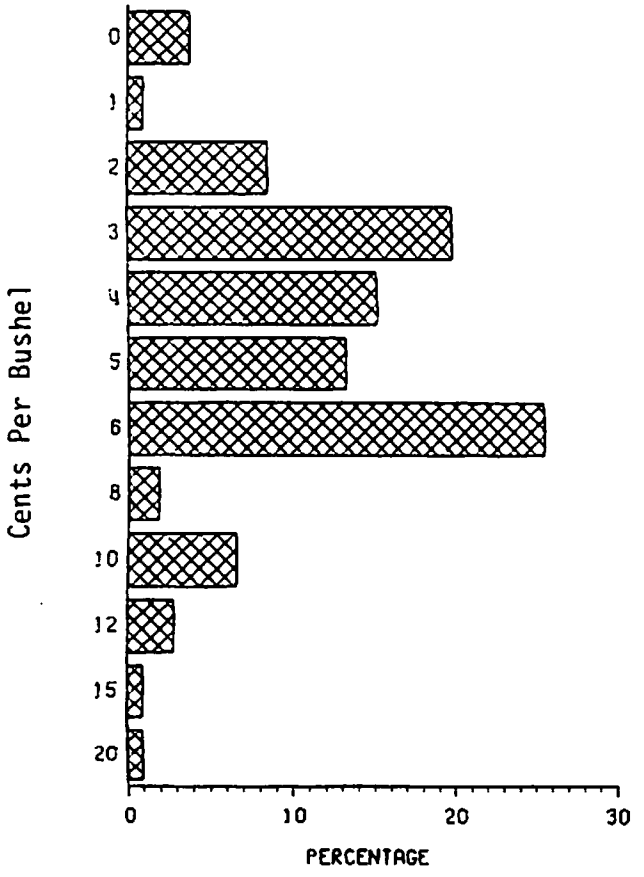


Figure 6. Frequency of Discounts for 1 Percent Foreign Material Durum Among Selected Country Elevators in North Dakota



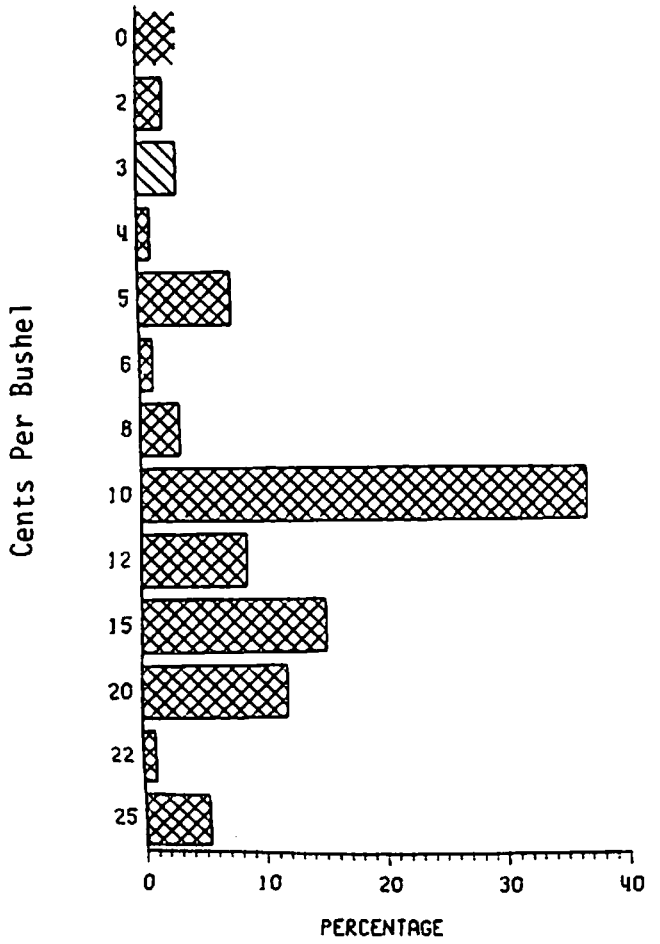
	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
0	16	16	16.16	16.16
2	18	34	18.18	34.34
3	4	38	4.04	38.38
4	8	46	8.08	46.46
5	14	60	14.14	60.61
6	16	76	16.16	76.77
7	2	78	2.02	78.79
8	4	82	4.04	82.83
10	13	95	13.13	95.96
12	2	97	2.02	97.98
15	2	99	2.02	100.00

Figure 7. Frequency of Discounts for 5 Percent Shrunken and Broken Durum Among Selected Country Elevators in North Dakota



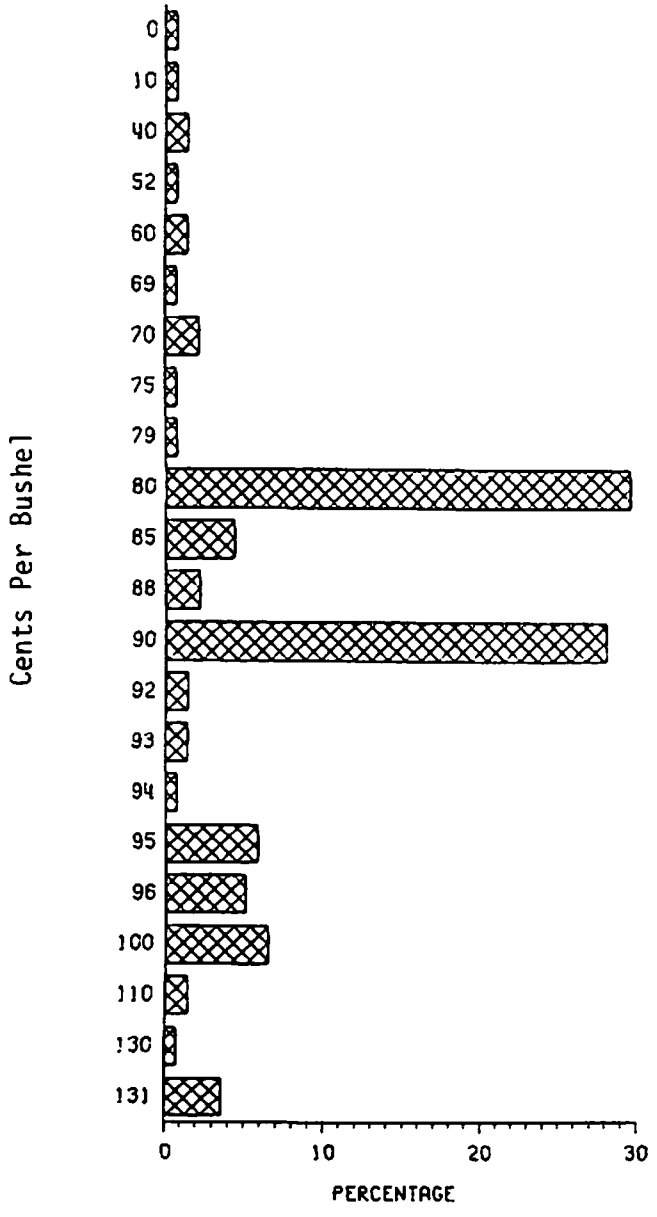
	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
0	4	4	3.77	3.77
1	1	5	0.94	4.72
2	9	4	8.49	13.21
3	21	35	19.81	33.02
4	16	51	15.09	48.11
5	14	65	13.21	61.32
6	27	92	25.47	86.79
8	2	94	1.89	88.68
10	7	101	6.60	95.28
12	3	104	2.83	98.11
15	1	105	0.94	99.06
20	1	106	0.94	100.00

Figure 8. Frequency of Discounts for 2 Percent Contrasting Classes Durum Among Selected Country Elevators in North Dakota



	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
0	3	3	3.23	3.23
2	2	5	2.15	5.38
3	3	8	3.23	8.60
4	1	9	1.08	9.68
5	7	16	7.53	17.20
6	1	17	1.08	18.28
8	3	20	3.23	21.51
10	34	54	36.56	58.06
12	8	62	8.60	66.67
15	14	76	15.05	81.72
20	11	87	11.83	93.55
22	1	88	1.08	94.62
25	5	93	5.38	100.00

Figure 9. Frequency of Discounts for 5 Percent Wheat of Other Classes Durum Among Selected Country Elevators in North Dakota



	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
0	1	1	0.72	0.72
10	1	2	0.72	1.44
40	2	4	1.44	2.88
52	1	5	0.72	3.60
60	2	7	1.44	5.04
69	1	8	0.72	5.76
70	3	11	2.16	7.91
75	1	12	0.72	8.63
79	1	13	0.72	9.35
80	41	54	29.50	38.85
85	6	60	4.32	43.17
88	3	63	2.16	45.32
90	39	102	28.06	73.38
92	2	104	1.44	74.82
93	2	106	1.44	76.26
94	1	107	0.72	76.98
95	8	115	5.76	82.73
96	7	122	5.04	87.77
100	9	131	6.47	94.24
110	2	133	1.44	95.68
130	1	134	0.72	96.40
131	5	139	3.60	100.00

Figure 10. Frequency of Protein Premiums for 16 Percent Protein HRS Wheat Among Selected Country Elevators in North Dakota

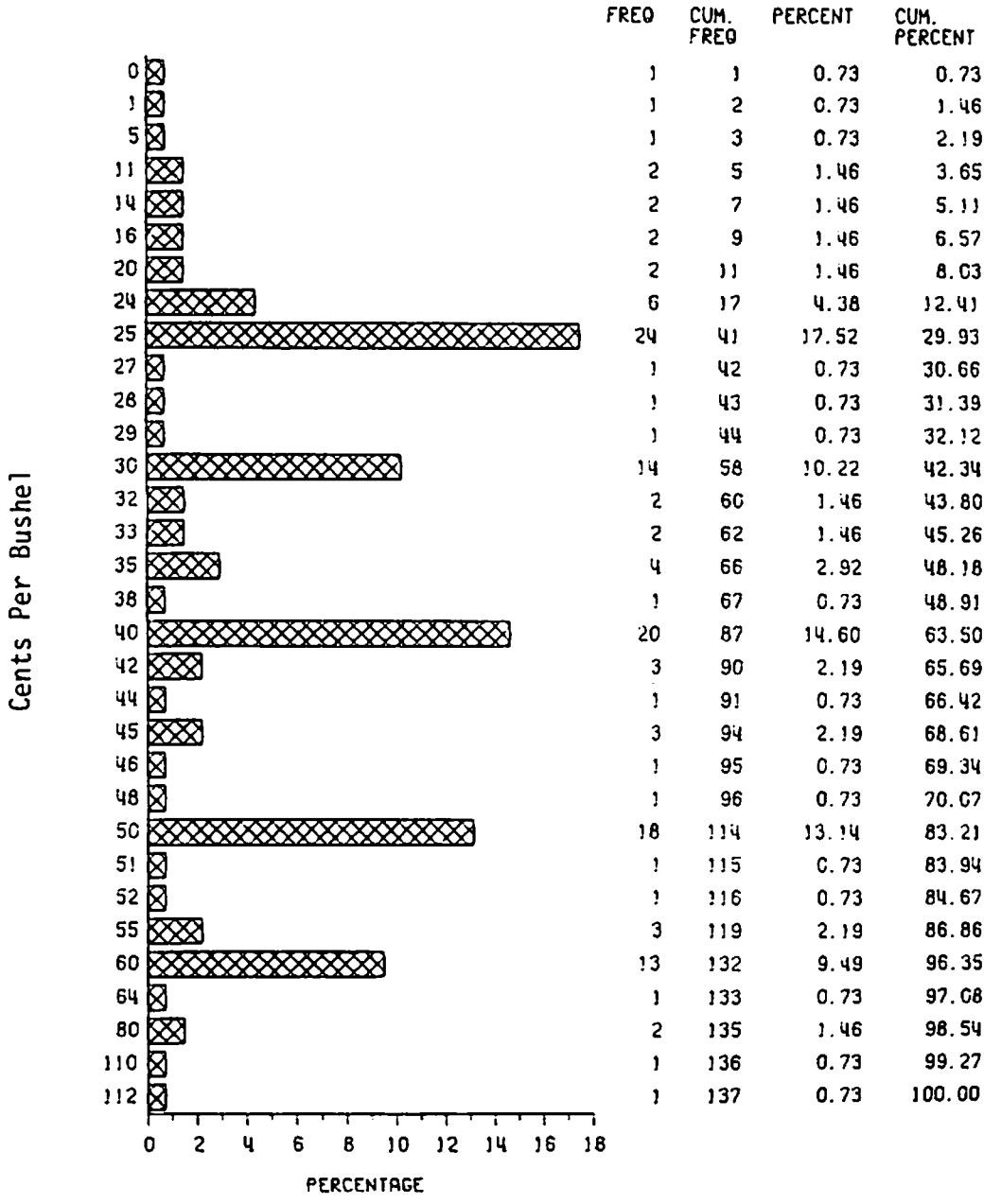
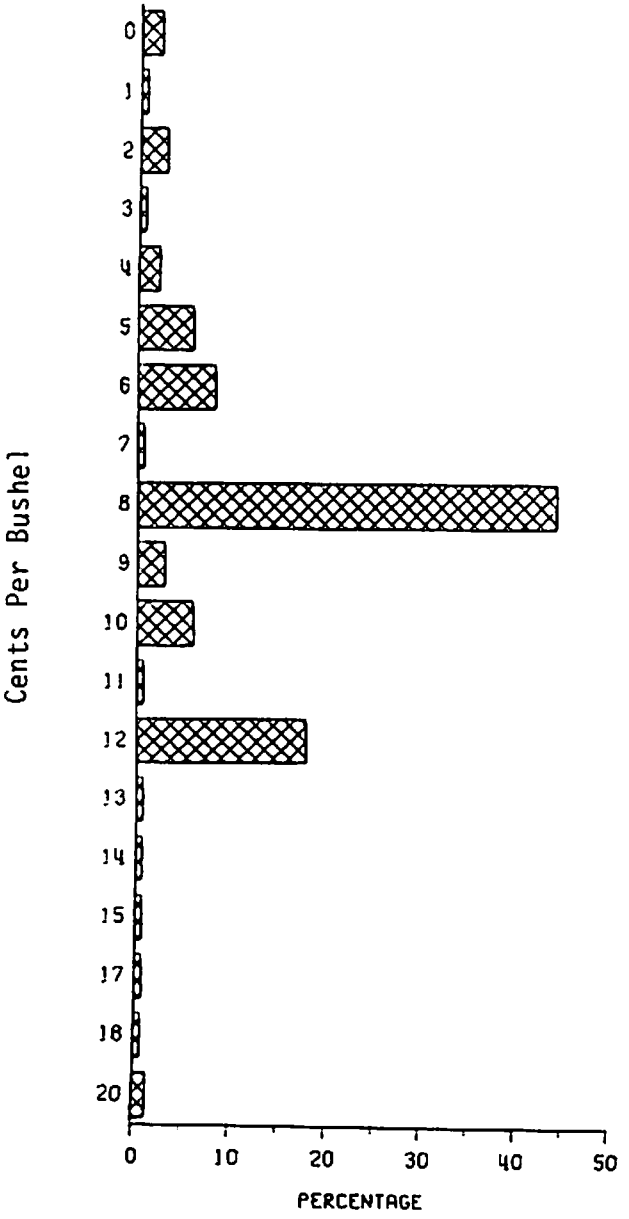
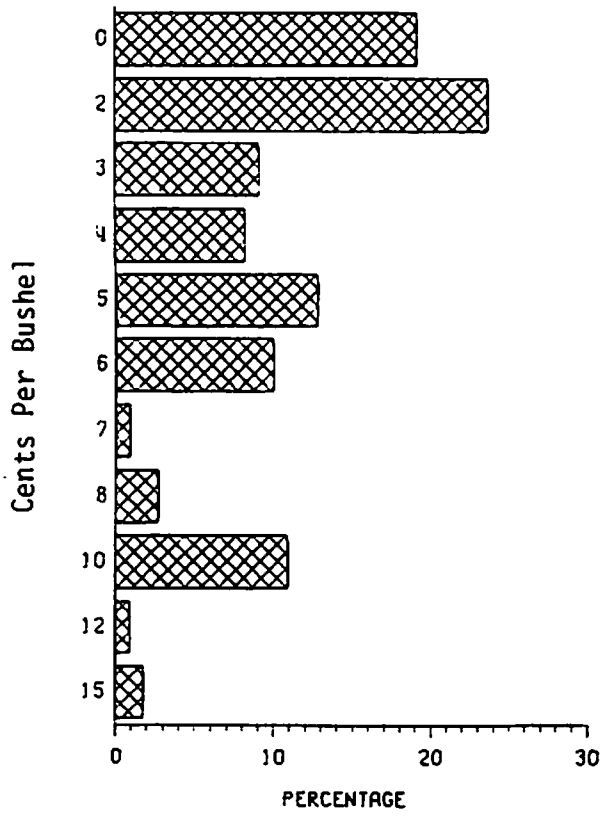


Figure 11. Frequency of Protein Discounts for 12 Percent HRS Wheat Among Selected Country Elevators in North Dakota



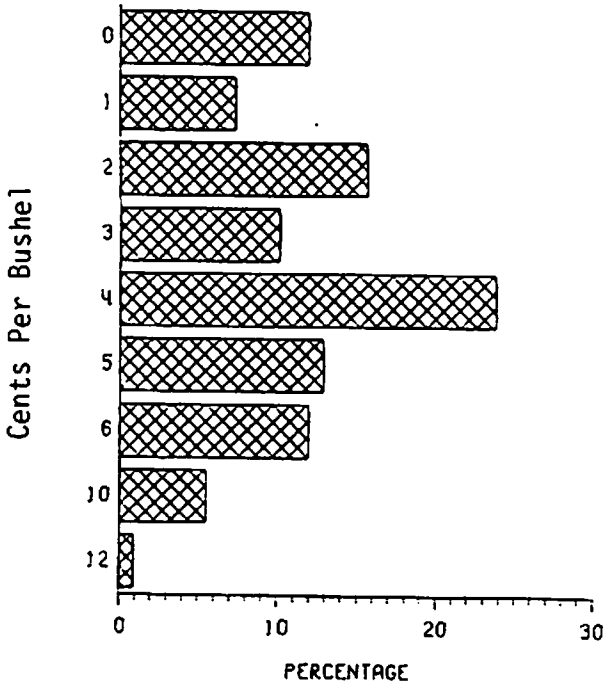
	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
0	3	3	2.21	2.21
1	1	4	0.74	2.94
2	4	8	2.94	5.88
3	1	9	0.74	6.62
4	3	12	2.21	8.82
5	8	20	5.88	14.71
6	11	31	8.09	22.79
7	1	32	0.74	23.53
8	60	92	44.12	67.65
9	4	96	2.94	70.59
10	8	104	5.88	76.47
11	1	105	0.74	77.21
12	24	129	17.65	94.85
13	1	130	0.74	95.59
14	1	131	0.74	96.32
15	1	132	0.74	97.06
17	1	133	0.74	97.79
18	1	134	0.74	98.53
20	2	136	1.47	100.00

Figure 12. Frequency of Damage Discounts for 4 Percent Total Damage HRS Wheat Among Selected Country Elevators in North Dakota



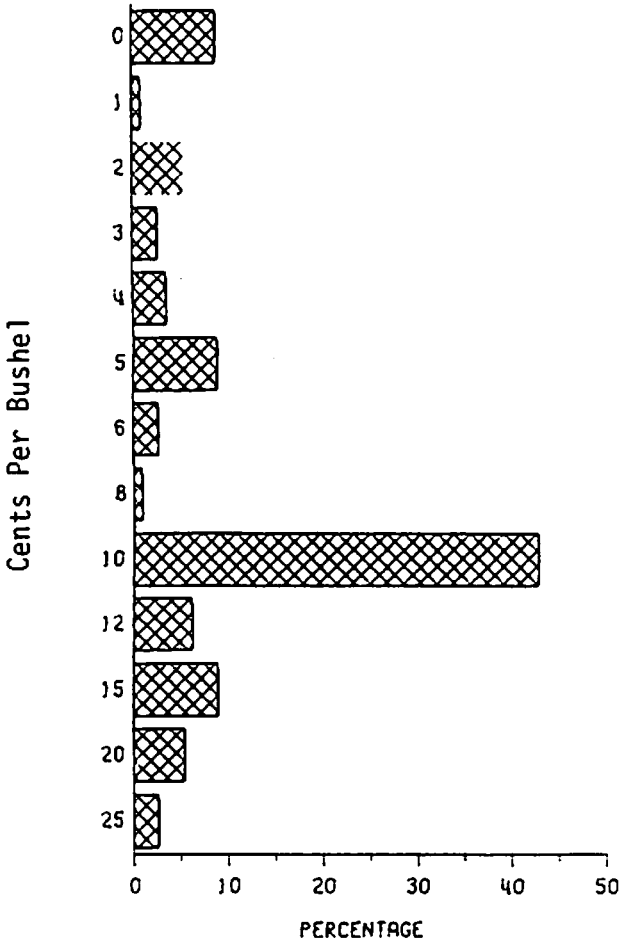
	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
0	21	21	19.09	19.09
2	26	47	23.64	42.73
3	10	57	9.09	51.82
4	9	66	8.18	60.00
5	14	80	12.73	72.73
6	11	91	10.00	82.73
7	1	92	0.91	83.64
8	3	95	2.73	86.36
10	12	107	10.91	97.27
12	1	108	0.91	98.18
15	2	110	1.82	100.00

Figure 13. Frequency of Discounts for 5 Percent Shrunken and Broken HRS Wheat Among Selected Country Elevators in North Dakota



	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
0	13	13	11.93	11.93
1	8	21	7.34	19.27
2	17	38	15.60	34.86
3	11	49	10.09	44.95
4	26	75	23.85	68.81
5	14	89	12.84	81.65
6	13	102	11.93	93.58
10	6	108	5.50	99.08
12	1	109	0.92	100.00

Figure 14. Frequency of Discounts for 2 Percent Contrasting Classes HRS Wheat Among Selected Country Elevators in North Dakota



	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
0	10	10	8.93	8.93
1	1	11	0.89	9.82
2	6	17	5.36	15.18
3	3	20	2.68	17.86
4	4	24	3.57	21.43
5	10	34	8.93	30.36
6	3	37	2.68	33.04
8	1	38	0.89	33.93
10	48	86	42.86	76.79
12	7	93	6.25	83.04
15	10	103	8.93	91.96
20	6	109	5.36	97.32
25	3	112	2.68	100.00

Figure 15. Frequency of Discounts for 5 Percent Wheat of Other Classes HRS Wheat Among Selected Country Elevators in North Dakota

Appendix C

GRAIN MARKETING QUESTIONNAIRE
(Fall 1987)

1. Name of firm _____

2. Location of firm _____

3. This elevator is a:
   _____ (a) Locally owned cooperative elevator
   _____ (b) Harvest States line elevator
   _____ (c) Locally owned private elevator
   _____ (d) Line elevator of a large private company
   _____ (e) Other _____

4. What is the largest number of rail cars that your elevator can load in one day?
   _____ (a) Less than 6 cars
   _____ (b) Between 7 and 26 cars
   _____ (c) Between 27 and 54 cars
   _____ (d) More than 54 cars

5. How far away is your nearest competition?
   _____ (a) Less than 5 miles
   _____ (b) 6 to 10 miles
   _____ (c) More than 10 miles

6. What is the total plant storage capacity at this facility? _____ bushels

7. What were the major commission companies or track buyers you sell your Durum and HRS Wheat through and the approximate percentage of sales to each?

Name	Approximate Percent of Sales	
	Durum	HRS Wheat
a. Harvest States		
b. Peavey		
c. Cargill		
d. Atwood-Larson		
e. Benson-Quinn		
f. Kellogg		
g. Continental		
h. IMF		
i. _____		
j. _____		

8. What percentage of your wheat is cleaned before shipment? _____%

9. At what dockage percentage do you not clean wheat?
   Harvest_____ Post Harvest_____

10. How many bushels can you clean per hour? _____

11. To what dockage percentage do you clean your wheat down?
   Harvest_____ Post Harvest_____

12. What would you estimate your cleaning costs to be in cents per bushel? _____

13. To whom do you sell your screenings? _____

14. What price do you receive for wheat screenings? _____

15. What was your board price for #1 Hard Amber Durum (milling) on November 9, 1987? _____

16. What are your discounts for Durum which grade the following values? (Base grade = #1 HAD)

a.	58 lb. Test Weight	_____¢/Bu.
b.	14.5% Moisture	_____¢/Bu.
c.	Amber Durum (Color)	_____¢/Bu.
d.	4% Total Damaged Kernels	_____¢/Bu.
e.	1% Foreign Material	_____¢/Bu.
f.	5% Shrunken & Broken Kernels	_____¢/Bu.
g.	2% Contrasting Classes	_____¢/Bu.
h.	5% Wheat of Other Classes	_____¢/Bu.
i.	Variety: Premium (+) - Discount (-)	_____¢/Bu.
	Vic	_____¢/Bu.
	Ward	_____¢/Bu.
	Lloyd	_____¢/Bu.
	Other varieties	_____¢/Bu.
j.	Other_____	_____¢/Bu.

17. What was your board price for #1 DNS 14% protein on November 9, 1987? _____

18. What are your discounts and premiums for HRS wheat which grade the following values? (Base grade = #1 DNS 14% protein)

a.	57 lb. Test Weight	_____¢/Bu.	
b.	14.5% Moisture	_____¢/Bu.	
c.	16% Protein	_____¢/Bu.	(tested 12% moisture)
d.	12% Protein	_____¢/Bu.	(tested 12% moisture)
e.	4% Total Damaged Kernels	_____¢/Bu.	
f.	1% Foreign Materials	_____¢/Bu.	
g.	5% Shrunken & Broken Kernels	_____¢/Bu.	
h.	2% Contrasting Classes	_____¢/Bu.	
i.	5% Wheat of Other Classes	_____¢/Bu.	
j.	Other_____	_____¢/Bu.	

19. As of May 1, 1987, by law, dockage is measured to the nearest .1 of a percent. Has your firm changed its policy toward deducting for dockage? _____Yes _____No

20. If yes, which of the following?
_____ Deduct dockage to nearest .1 of a percent
_____ Charge cleaning cost to farmer
_____ Taken a cash discount for dockage
_____ Other

21. Would you like a copy of the completed report? _____Yes _____No

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