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Pricing and Marketing Practices For North Dakota Durum and HRS Wheat 1988 Crop Year

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Highlights

Cash markets reflect the fundamentals of supply and demand for specific and related commodities. In addition, it is through cash market transactions in which price differentials for quality are established. These premiums and discounts are crucial in transmitting signals to participants throughout the market place, including the breeders, producers, merchandisers, handlers, and end-users. In this report the results of a survey of North Dakota country elevators are presented. This is a continuation of similar surveys conducted in previous years beginning in 1984. The results show that throughout these past years there have been significant increases in most premiums and discounts for most factors in HRS and Durum wheat in North Dakota, suggesting the increasing importance in quality to market participants. However, protein premiums narrowed substantially in the 1988 crop year. The report also presents some structural and operational characteristics of the country elevator industry in North Dakota.

PRICING AND MARKETING PRACTICES FOR NORTH DAKOTA DURUM AND HRS WHEAT 1988 CROP YEAR

William W. Wilson*

Introduction

Cash market prices reflect the fundamentals of supply and demand for specific and related crops. In addition, cash market transactions reflect price differentials for quality characteristics. These are crucial for transmitting signals amongst market participants of the value of particular quality characteristics.

Premiums and discounts for particular quality characteristics are rarely published, if at all. The reason for this is that premiums and discounts are truly those which exist between individual market participants, and as such vary through time, location, and with respect to competitive conditions. However, knowing the behavior of premiums and discounts is fairly important in understanding the pricing mechanisms. These are particularly important for wheat production in the upper midwest in which price differentials are fairly wide. For these reasons the Department of Agricultural Economics began surveying country shippers in 1984 about these pricing practices. These reports have been of great interest to the industry as indicated by the relative high response rate.

This report presents the results from the survey conducted in November 1988, with comparisons to previous years. More detail from these previous reports are contained in the references and are available from the author. In the first section below the general characteristics of the participating elevators are described. Premiums and discounts for Hard Red Spring (HRS) and Durum wheat are presented in the next section. Crucial variables affecting the economics of dockage removal are presented in the third section and a summary is presented in the final section. The text is very brief since the tables and figures are all self-explanatory. All the tables which are referenced in the text are contained in Appendix A, and figures are in Appendix B. The survey instrument is contained in Appendix C.

General Characteristics of Participating Elevators

Questionnaires were sent to 512 elevators in North Dakota and 30% responded, resulting in 152 useable observations (Table 1). About two-thirds of the respondents were locally owned cooperatives which was the predominant form of legal ownership (Table 2). The majority of the elevators had a load-out capacity of 7-26 cars per day, with 20% of the elevators capable of loading more than 54 cars/day (Table 3). One-half of the elevators had a nearest competitor between 6 and 10 miles away (Table 4).

Market shares of commission companies and track buyers were similar to previous years. Harvest States was the largest buyer of both HRS and Durum,

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followed by Atwood-Larson and Benson-Quinn, each with about 15% of the originations (Table 7). However, ranking of market shares of these commission companies and track buyers varied across the state, legal ownership, and size of the elevator (Tables 8-11).

Premiums and Discounts

The 1988 crop was characterized by fairly good quality compared to previous years (Table 12). Another important characteristic of the 1988 crop year was the abnormally high level of protein available to the market in both Hard Red Winter (HRW) and HRS. Figure 2 shows these figures which are averages from the Kansas HRW crop and the North Dakota HRS crop. As a result of the relative large supply of protein, premiums for this quality factor fell drastically this past year from previous year highs. For a longer term comparison, Figure 3 shows these values since 1966. The premium for HRW is at Kansas City and reflects the difference between 13% and Ordinary protein. That for HRS is at Minneapolis and is defined as the difference between 15 and 12% protein.

Average values for premiums and discounts are shown in Table 13 for 1988 and comparisons to previous years. The base grade used in the survey was No. 1 Hard Amber Durum (HAD) and No. 1 Dark Northern Spring (DNS) 14% protein. The survey then asked for the premium or discount which would apply for particular factor levels. These were the equivalent of the No. 2 factor limit. Comparisons are also made across locations, ownership, and elevator size in subsequent tables. Figures 4-6 show the behavior of selected discounts for these two classes of wheat over the past 5 crop years. Of particular interest is the extent of increases in discounts for certain factors, most notable being damage kernels. In addition the discount for Amber Durum has increased from 5.7¢/lb to nearly 27¢/lb in 1988.

The frequency distributions of premiums and discounts (Figures 7-23 in appendix B) reveal several interesting observations. The vertical axis in those figures represents the premium or discount in ¢/bushel. The horizontal axis indicates the percent of respondents who used a particular discount or premium value. For example, in 1988 34.5 percent of the respondents had a test weight discount for 58 lbs of 8¢/bushel. That figure also shows that 70.8 percent of the respondents charged a discount of 8¢ or less.[1]. For some factors, the discounts were very similar or identical across a large portion of the respondents. These include: test weight, amber, damage, wheat of other classes in durum and test weight, damage and wheat of other classes in HRS; and are reflected in the figures by a predominant spike in the distribution figure. Premiums and discounts for other factors are more dispersed across elevators. These include: moisture, foreign material, shrunken and broken, and contrasting classes in durum; and moisture, protein, foreign material shrunken and broken, and contrasting classes in HRS; and are reflected in a fairly wide dispersion in the distribution.

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[1]In these figures FREQ and CUM.FREQ stand for frequency and cumulative figuring, respectively.

Economics of Dockage Removal

Managers were asked questions about important variables which influence the economics of dockage removal. Average cleaning capacity of these elevators was 1,630 bushels per hour, with a range of 100 to 11,000. At harvest, managers called incoming wheat clean at an average of 1.8 percent dockage and did not physically clean that wheat. After harvest, incoming wheat was called clean if dockage was less than 1.4 percent and was not cleaned further. During harvest wheat was cleaned down to an average .84 percent. After harvest wheat was cleaned down to an average of .77 percent. Compared to previous years, wheat with a lower level of incoming dockage was cleaned, and when cleaned, it was cleaned to lower levels.

Two important variables affecting the economics of wheat cleaning are shown in Table 19. The average cost of cleaning across respondents was 4¢/lb, which is essentially unchanged from previous years. The price of screenings (prices received) were up substantially from the previous two years. The average was about $27/ton, compared to $9.90 in 1987 and $16.08 in 1986.

Summary and Conclusions

Premiums and discounts for most grade and non-grade factors vary substantially through time. Protein premiums in HRS are quite unstable, and in 1988 fell virtually to nil compared to the record levels of the previous two years. Discounts for other factors have generally increased over the past 5 years. These trends are in part reflective of the apparent increasing importance of these quality characteristics and quality specificity in the grain markets in recent years.

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Appendix A

TABLE 1. NUMBER AND PERCENTAGE OF RESPONSES FROM NINE REGIONS ACROSS NORTH DAKOTA, 1988

Region	Number of Elevators Receiving Questionnaires	Number of Elevators Responding	Percentage Responding
1. Northwest	64	21	33
2. North Central	44	12	27
3. Northeast	111	32	29
4. West Central	24	10	42
5. Central	50	15	30
6. East Central	82	25	30
7. Southwest	31	4	13
8. South Central	33	12	36
9. Southeast	73	21	34
Total	512	152	30

SOURCE: Question 2.

TABLE 2. ORGANIZATIONAL STRUCTURE OF RESPONDING ELEVATORS, 1988

Types	Number	Percentage
Locally owned cooperatives	101	66
Harvest states line elevator	7	13
Locally owned private elevator	27	18
Line elevator of large private	12	8
company	5	3
Other		
Total	152	100

TABLE 3. LOAD-OUT CAPACITY OF RESPONDING ELEVATORS, 1988

Load-Out Capacity	Number	Percentage
6 or less cars/day	31	20
7 - 26 cars/day	81	53
27 - 54 cars/day	31	20
More than 54 cars/day	9	6
Total	152	100

SOURCE: Question 4.

TABLE 4. DISTANCE TO NEAREST COMPETITION OF RESPONDING ELEVATORS, 1988

Distance to Competition	Number	Percentage
Less than 5 miles	48	32
6 - 10 miles	76	50
More than 10 miles	28	18
Total	152	100

SOURCE: Question 5.

TABLE 5. STORAGE CAPACITY OF RESPONDING ELEVATORS, 1988

Storage Capacity	Number	Percentage
Less than 100,000 bushels	7	5
100,000 to 199,000 bushels	20	13
200,000 to 299,000 bushels	20	13
300,000 to 399,000 bushels	28	18
400,000 to 699,000 bushels	42	28
700,000 to 999,000 bushels	19	13
Over 1,000,000 bushels	16	11
Total	152	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 1, 1988

Region	Average Durum Price	Average HRS Wheat Price
1. Northwest	528	383
2. North Central	531	378
3. Northeast	546	372
4. West Central	542	385
5. Central	531	376
6. East Central	509	377
7. Southwest	532	394
8. South Central	512	377
9. Southeast	525	377
State	529	378

SOURCE: Question 15 and 17.

TABLE 7. MARKET SHARE OF COMMISSION COMPANIES AND TRACK BUYERS BY RESPONDING ELEVATORS FOR DURUM AND HRS WHEAT (FALL 1988)

Company	Durum	HRS Wheat
	----- percent	------
Harvest States	34	30
Atwood-Larson	18	15
Benson-Quinn	14	15
Kellogg	11	9
Cargill	4	7
Peavey	3	7
Continental	3	4
International Multifoods	2	3
North Dakota State Mill	6	1
Others	6	9

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 1988)

Commodity (Base Grade)	Company	Region 1	2	3	4	5	6	7	8	9
		percent								
Durum	Harvest States	39	35	45	34	34	18	97	39	19
	Atwood-Larson	11	28	12	26	22	15	0	14	30
	Benson Quinn	6	8	14	21	21	21	0	0	17
	Kellogg	6	1	6	14	7	8	0	39	20
	Cargill	11	18	0	3	2	4	2	0	0
	Peavey	2	0	7	1	1	6	0	0	0
	Continental	7	0	0	1	8	3	0	8	1
	IMF	0	0	3	0	0	7	0	0	0
	Others	17	9	14	1	6	19	2	0	13
HRS	Harvest States	4	34	38	29	28	16	42	23	34
	Atwood-Larson	4	36	13	20	7	13	5	12	22
	Benson Quinn	5	0	21	22	19	21	25	6	11
	Kellogg	6	0	5	8	7	6	0	47	14
	Cargill	12	14	5	11	3	12	3	0	1
	Peavey	1	0	10	1	10	8	2	11	8
	Continental	11	0	1	1	8	8	7	0	2
	IMF	3	0	1	0	0	11	0	0	0
	Others	14	15	8	12	19	5	17	1	10

TABLE 9. MARKET SHARE OF COMMISSION COMPANIES AND TRACK BUYERS BY ORGANIZATION FROM RESPONDING ELEVATOR FOR DURUM AND HRS WHEAT (FALL 1988)

Commodity (Base Grade)	Company	Private	Cooperative
		------ percent -------	
Durum	Harvest States	5	45
	Atwood-Larson	34	13
	Benson Quinn	5	17
	Kellogg	20	7
	Cargill	11	2
	Peavey	4	2
	Continental	4	3
	IMF	6	0
	Others	11	11
HRS	Harvest States	3	41
	Atwood-Larson	24	12
	Benson Quinn	10	17
	Kellogg	15	7
	Cargill	13	5
	Peavey	13	4
	Continental	8	3
	IMF	8	0
	Others	7	11

TABLE 10. MARKET SHARE OF COMMISSION COMPANIES AND TRACK BUYERS BY SIZE OF ELEVATORS FOR DURUM AND HRS WHEAT (FALL 1988)

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 699,000	700,000 To 999,000	Over 1,000,000
		percent						
Durum	Harvest States	16	32	46	42	29	40	27
	Atwood-Larson	20	26	17	12	20	25	10
	Benson Quinn	14	8	7	11	20	11	20
	Kellogg	29	19	14	17	6	5	0
	Cargill	4	0	0	5	4	3	12
	Peavey	0	0	5	5	3	1	2
	Continental	0	0	1	0	4	0	13
	IMF	7	0	0	0	3	0	1
	Others	10	14	9	8	10	15	13
HRS	Harvest States	14	34	40	34	26	37	18
	Atwood-Larson	22	16	16	5	17	21	12
	Benson Quinn	9	12	11	16	20	7	20
	Kellogg	14	11	13	21	4	7	0
	Cargill	7	0	3	3	8	10	19
	Peavey	10	3	6	8	7	6	7
	Continental	5	6	1	0	5	2	15
	IMF	4	0	5	4	4	0	0
	Others	14	18	5	9	10	9	8

TABLE 11. MARKET SHARE COMMISSION COMPANIES AND TRACK BUYER BY LOAD-OUT CAPACITY FROM RESPONDING ELEVATOR FOR DURUM AND HRS WHEAT (FALL 1988)

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	28	34	34	59
	Atwood-Larson	13	23	16	3
	Benson Quinn	5	13	26	0
	Kellogg	29	11	1	0
	Cargill	2	4	7	3
	Peavey	0	3	4	0
	Continental	0	3	6	1
	IMF	3	0	1	17
	Others	21	10	7	18
HRS	Harvest States	25	30	31	50
	Atwood-Larson	7	18	16	20
	Benson Quinn	10	17	20	0
	Kellogg	20	10	0	0
	Cargill	6	5	10	11
	Peavey	5	8	6	0
	Continental	0	4	10	2
	IMF	7	1	0	14
	Others	20	9	5	3

*Totals may not add to 100 due to rounding.

TABLE 12. QUALITY OF 1986, 1987, AND 1988 DURUM AND HRS WHEAT CROPS

Commodity (Base Grade)	Factor	1986	1987	1988
		Average Values		
Durum	Test weight	59.3 lbs.	58.5	60.4
	Moisture %	12.4	12.2	10.9
	Grade	2 HAD	2 HAD	2 HAD
	Shrunken and broken kernels %	1.2	.9	0.9
	Foreign material %	0.1	.2	0.3
	Damaged kernels %	0.8	1.5	0.3
	Contrasting classes %	0.4	.6	0.7
HRS	Test weight	58.7 lbs.	58.9	60.2
	Moisture %	12.4	12.2	10.6
	Protein %	14.6	14.9	16.6
	Shrunken and broken kernels %	1.6	1.3	1.9
	Foreign material %	0.0	.2	0.1
	Damaged kernels %	0.6	.6	0.1
	Contrasting classes %	0.0	.0	0.2

SOURCE: 1986, 1987, and 1988 durum wheat and HRS wheat quality reports, Department of Food Science and Cereal Technology, North Dakota State University, Fargo, ND.

TABLE 13. AVERAGE PRICE ADJUSTMENTS FOR EACH FACTOR AMONG RESPONDING NORTH DAKOTA COUNTRY ELEVATORS (FALL OF 1984, 1985, 1986, 1987, and 1988)

Commodity (Base Grade)	Factor	1984	1985	1986	1987	1988
		¢/bu.				
Durum #1 HAD	58 lbs. test weight	-2.2	-2.2	-2.7	-7.0	-10.7
	14.5% moisture	-6.0	-7.6	-7.2	-7.3	- 7.8
	Amber durum	-5.7	-16.7	-21.0	-22.6	-26.8
	4% damaged kernels	-6.0	-6.9	-8.4	-8.9	-12.8
	1% foreign material	-2.8	-1.9	-1.9	-2.4	- 2.9
	5% shrunken and broken kernels	-6.6	-3.9	-5.0	-4.8	- 5.9
	2% contrasting classes	-2.0	-4.4	-4.8	-5.0	- 6.6
	5% wheat of other classes	--	-9.9	-11.7	-11.8	-16.2
HRS #1 DNS 14% Protein	57 lbs. test weight	-1.9	-1.8	-2.9	-3.2	- 3.6
	14.5% moisture	-5.9	-6.8	-6.5	-7.5	- 5.7
	16% protein	41.0	63.4	62.6	86.8	9.7
	12% protein	-38.0	-67.4	-43.9	-38.5	-12.6
	4% damaged kernels	-2.0	-6.6	-8.9	-8.4	-10.5
	1% foreign material	-1.4	-1.3	-1.7	-2.0	- 1.8
	5% shrunken and broken kernels	-2.2	-3.0	-4.2	-4.1	- 4.7
	2% contrasting classes	-1.6	-3.2	-3.5	-3.7	- 4.6
	5% wheat of other classes	--	-7.0	-8.6	-9.1	- 9.6

SOURCE: Questions 16 and 18.

TABLE 14. PRICE ADJUSTMENT AVERAGES FOR DURUM AND HRS WHEAT AMONG ELEVATORS OF SPECIFIED REGIONS IN NORTH DAKOTA (FALL 1988)

Commodity (Base Grade)	Factor	Region 1	2	3	4	5	6	7	8	9
		¢/bu.								
Durum #1 HAD	58 lbs. test weight	- 8	- 9	- 14	- 11	- 7	-19	-11	- 5	- 8
	14.5% moisture	- 6	- 8	- 7	- 7	- 6	-13	- 8	- 4	- 8
	Amber durum	- 22	- 21	- 19	- 25	-23	-24	-68	-48	-29
	4% damaged kernels	- 9	- 9	- 9	- 13	-17	-12	-12	-11	-22
	1% foreign material	- 2	- 3	- 3	- 2	- 3	- 3	- 0	- 3	- 4
	5% shrunken and broken kernels	- 5	- 5	- 5	- 4	- 6	- 7	- 2	- 6	-11
	2% contrasting classes	- 5	- 4	- 6	- 6	- 8	- 6	- 8	- 7	-11
	5% wheat of other classes	- 12	- 12	- 12	- 15	-17	-13	-20	-21	-31
HRS #1 DNS 14% Protein	57 lbs. test weight	- 3	- 4	- 7	- 2	- 3	- 3	- 2	- 3	- 3
	14.5% moisture	- 5	- 8	- 7	- 6	- 5	- 5	- 3	- 3	- 6
	16% protein	+ 6	- 5	+ 12	+ 3	+11	+13	+ 4	+ 9	+13
	12% protein	- 11	- 13	- 13	- 13	-12	-14	-16	-14	-11
	4% damaged kernels	- 10	- 10	- 9	- 16	-11	-10	-16	- 9	-12
	1% foreign material	- 2	- 13	- 1	- 2	- 2	- 2	- 0	- 3	- 1
	5% shrunken and broken kernels	- 5	- 14	- 4	- 2	- 5	- 5	- 4	- 5	- 6
	2% contrasting classes	- 4	- 5	- 5	- 4	- 5	- 5	- 3	-74	- 5
	5% wheat of other classes	- 9	- 15	- 7	- 12	- 7	- 7	- 7	-11	-12

SOURCE: Questions 2, 16, and 18.

TABLE 15. PRICE ADJUSTMENT AVERAGES FOR DURUM AND HRS WHEAT AMONG SELECTED TYPES OF ELEVATOR STRUCTURE ORGANIZATIONS (FALL 1988)

Commodity (Base Grade)	Factor	Cooperative	Private
		¢/bu.	
Durum #1 HAD	58 lbs. test weight	- 9	-14
	14.5% moisture	- 8	- 6
	Amber durum	-27	-26
	4% damaged kernels	-13	-11
	1% foreign material	- 3	- 3
	5% shrunken and broken kernels	- 6	- 5
	2% contrasting classes	- 7	- 5
	5% wheat of other classes	-18	-12
HRS #1 DNS 14% Protein	57 lbs. test weight	- 3	- 5
	14.5% moisture	- 6	- 5
	16% protein	+ 9	+11
	12% protein	-12	-13
	4% damaged kernels	-10	-10
	1% foreign material	- 2	- 2
	5% shrunken and broken kernels	- 5	- 4
	2% contrasting classes	- 5	- 4
	5% wheat of other classes	-10	- 9

TABLE 16. PRICE ADJUSTMENT AVERAGES FOR DURUM AND HRS WHEAT AMONG ELEVATORS WITH SELECTED LOAD-OUT CAPACITIES (FALL 1988)

Commodity (Base Grade)	Factor	Load-out Capacity: Less Than 6 Cars	7 To 26 Cars	27 To 54 Cars	Greater Than 54 Cars
Durum #1 HAD	58 lbs. test weight	-10	- 9	-13	-18
	14.5% moisture	- 8	- 8	- 8	- 7
	Amber durum	-28	-26	-24	-38
	4% damaged kernels	-14	-11	-15	-12
	1% foreign material	- 3	- 3	- 3	- 2
	5% shrunken and broken kernels	- 7	- 6	- 6	- 4
	2% contrasting classes	- 5	- 6	- 9	- 6
	5% wheat of other classes	-16	-16	-18	-12
HRS #1 DNS 14% Protein	57 lbs. test weight	- 6	- 3	- 3	- 3
	14.5% moisture	- 6	- 5	- 6	- 5
	16% protein	+ 9	+10	+ 9	+ 7
	12% protein	-14	-13	-11	-10
	4% damaged kernels	-11	-10	-11	-10
	1% foreign material	- 2	- 2	- 2	- 1
	5% shrunken and broken kernels	- 5	- 6	- 5	- 3
	2% contrasting classes	- 4	- 5	- 4	- 3
	5% wheat of other classes	- 9	-11	- 7	- 8

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 1988)

Commodity (Base Grade)	Factor	Less Than 5 Miles	6 To 10 Miles	Greater Than 10 Miles
		----------	¢/bu.	----------
Durum	58 lbs. test weight	-12	-10	-10
#1 HAD	14.5% moisture	- 7	- 9	- 6
	Amber durum	-22	-28	-31
	4% damaged kernels	-10	-14	-13
	1% foreign material	- 3	- 3	- 2
	5% shrunken and broken kernels	- 5	- 7	- 5
	2% contrasting classes	- 5	- 8	- 6
	5% wheat of other classes	-12	-18	-18
HRS	57 lbs. test weight	- 5	- 3	- 3
#1 DNS	14.5% moisture	- 6	- 6	- 5
14% Protein	16% protein	+11	+10	+ 8
	12% protein	-13	-12	-14
	4% damaged kernels	- 9	-12	-10
	1% foreign material	- 2	- 2	- 1
	5% shrunken and broken kernels	- 4	- 5	- 4
	2% contrasting classes	- 5	- 5	- 3
	5% wheat of other classes	- 8	-11	- 9

SOURCE: Questions 5, 16, and 18.

TABLE 18. PRICE ADJUSTMENT AVERAGES FOR DURUM AND HRS WHEAT AMONG ELEVATORS WITH SELECTED STORAGE CAPACITIES (FALL 1988)

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 699,000	700,000 To 999,000	Over 1,000,000
		¢/bu.						
Durum #1 HAD	58 lbs. test weight	-10	- 9	-10	-10	-13	- 9	-10
	14.5% moisture	- 8	- 7	- 8	- 7	- 6	-13	- 8
	Amber durum	-21	-34	-24	-31	-24	-29	-26
	4% damaged kernels	-13	-10	-16	-15	-12	-12	-12
	1% foreign material	- 3	- 3	- 3	- 3	- 3	- 3	- 2
	5% shrunken and broken kernels	- 5	- 9	- 6	- 6	- 6	- 5	- 4
	2% contrasting classes	- 5	- 5	- 7	- 6	- 9	- 6	- 5
	5% wheat of other classes	-12	-12	-19	-19	-19	-15	-11
HRS #1 DNS 14% Protein	57 lbs. test weight	- 3	- 3	- 3	- 3	- 5	- 3	- 3
	14.5% moisture	- 7	- 6	- 7	- 5	- 5	- 6	- 6
	16% protein	+13	+ 7	+11	+11	+10	+ 8	+ 9
	12% protein	- 8	-15	-12	-13	-13	-12	-11
	4% damaged kernels	- 7	-11	-11	-10	-10	-12	-11
	1% foreign material	- 1	- 2	- 2	- 2	- 1	- 2	- 2
	5% shrunken and broken kernels	- 6	- 6	- 5	- 5	- 4	- 5	- 4
	2% contrasting classes	- 4	- 5	- 5	- 4	- 6	- 5	- 3
	5% wheat of other classes	- 7	-10	-12	-10	-11	- 8	- 7

SOURCE: Questions 6, 16, and 18.

TABLE 19. AVERAGE, HIGH, AND LOW CLEANING COSTS AND WHEAT SCREENING PRICES FOR 1986, 1987, and 1988

Item	1986			1987			1988		
	Average	High	Low	Average	High	Low	Average	High	Low
	¢/bu.								
Cleaning Costs	4.0	25.00	0.0	3.5	20.00	0.0	4.00	20.00	0.00
	$/ton								
Prices received	16.08	45.00	0.0	9.90	30.00	0.0	26.94	45.00	10.00

SOURCE: Questions 12 and 14.

Appendix B

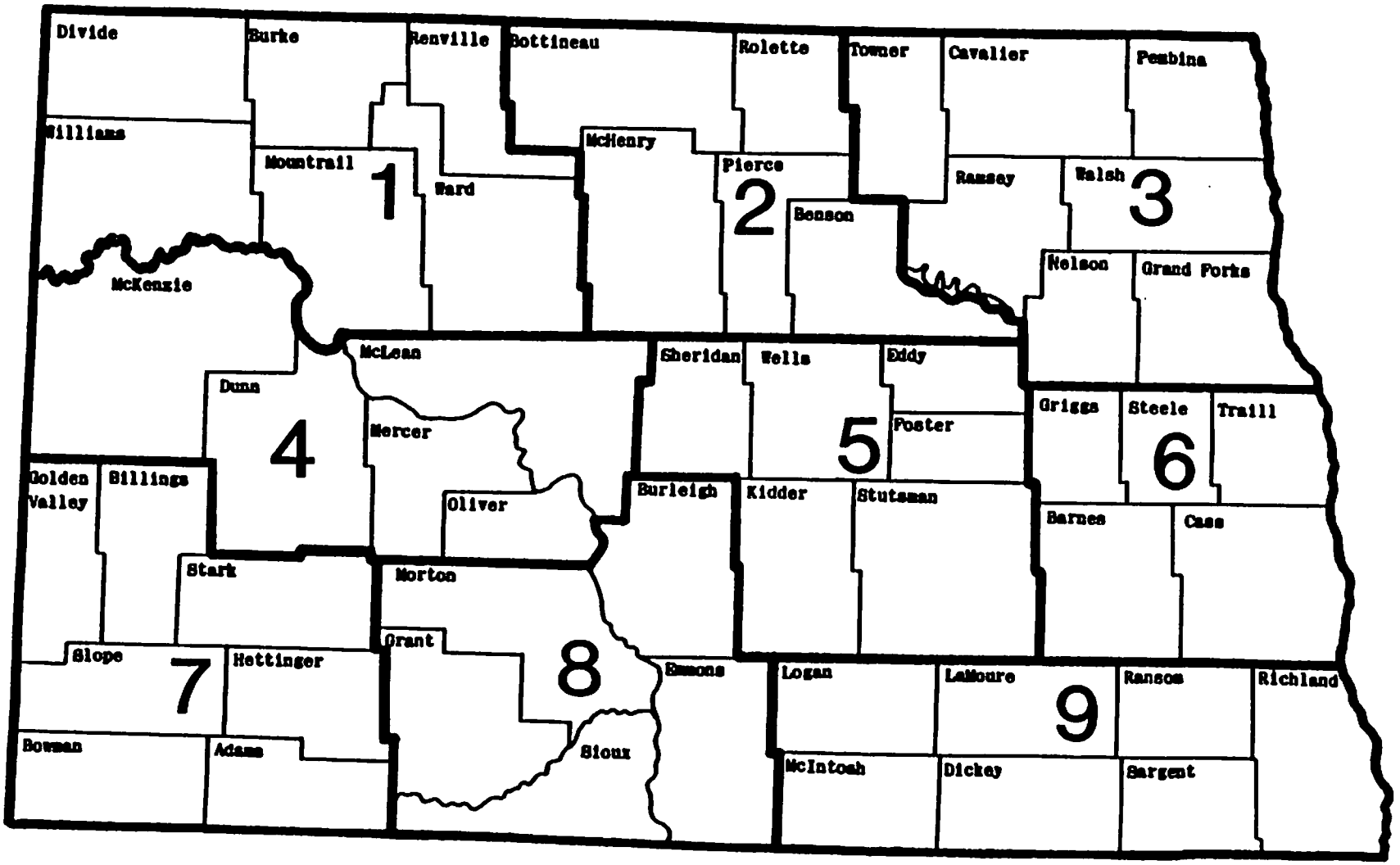


Figure 1. Nine Regions Used to Divide Responding Elevators by Location in the State

Figure 2. HRS and HRW Average Protein Level, North Dakota and Kansas

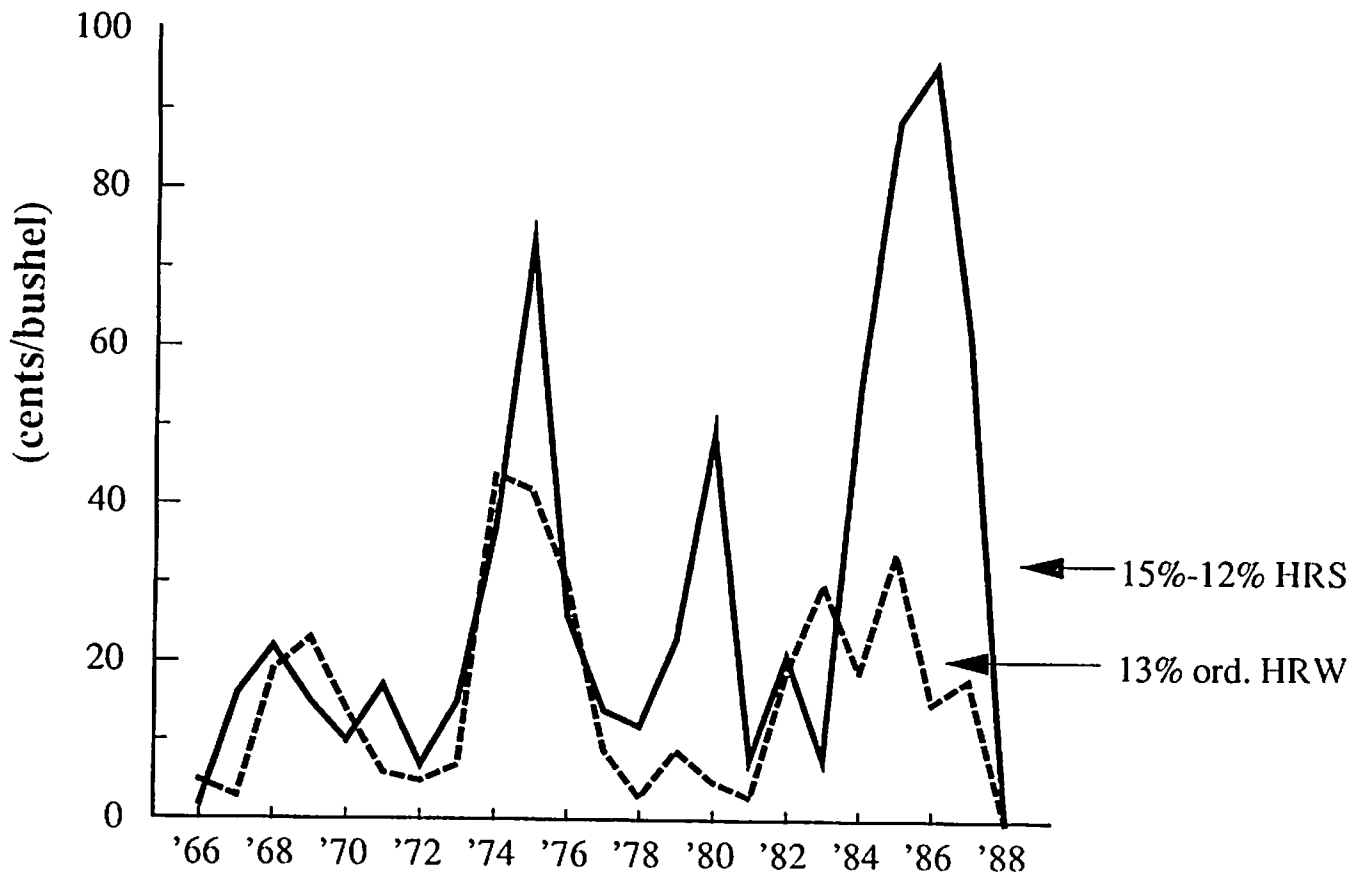


Figure 3. HRS and HRW Market Protein Premium

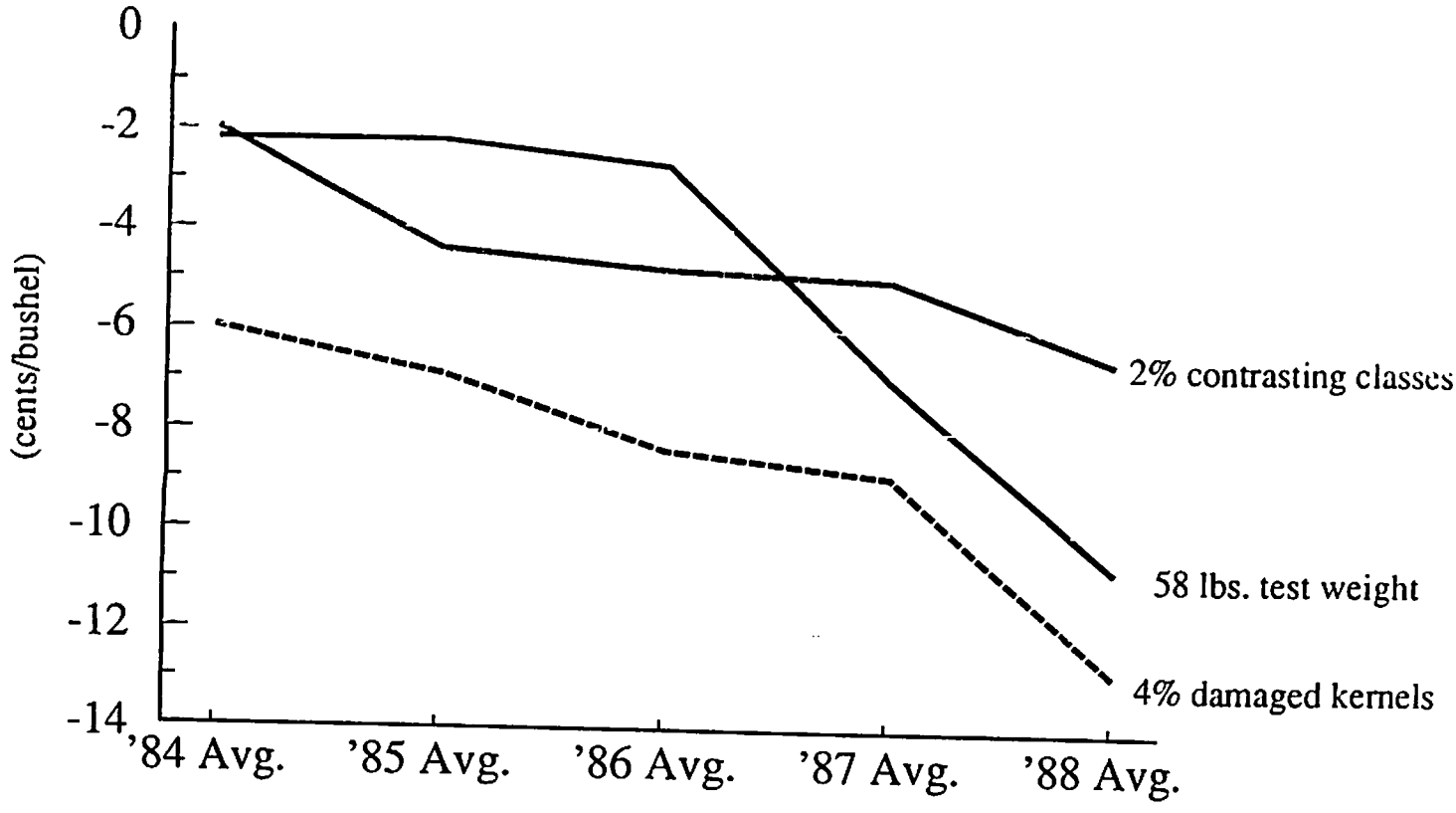


Figure 4. Average Price Adjustments Among North Dakota Country Elevators, Durum (#1 HAD)

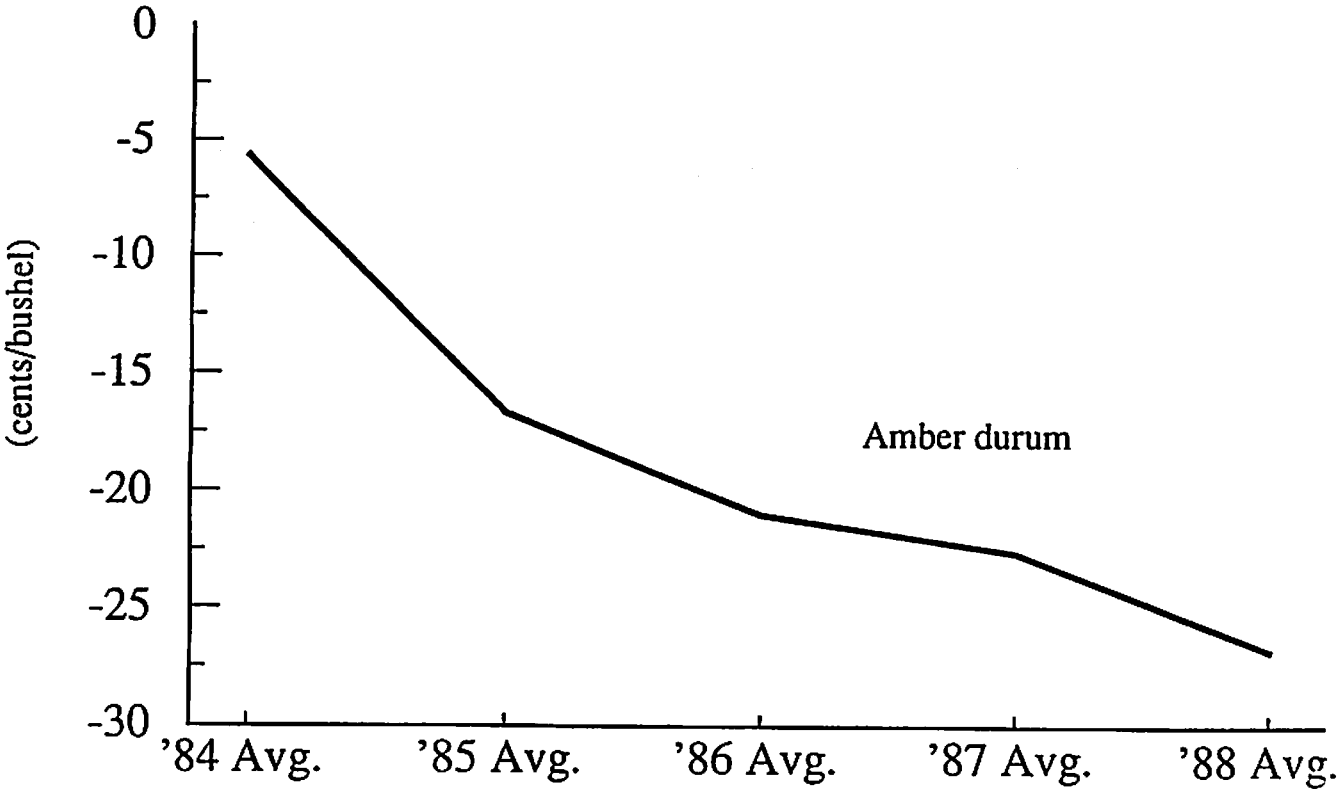


Figure 5. Average Price Adjustment Among North Dakota Country Elevators, Durum (#1 HAD)

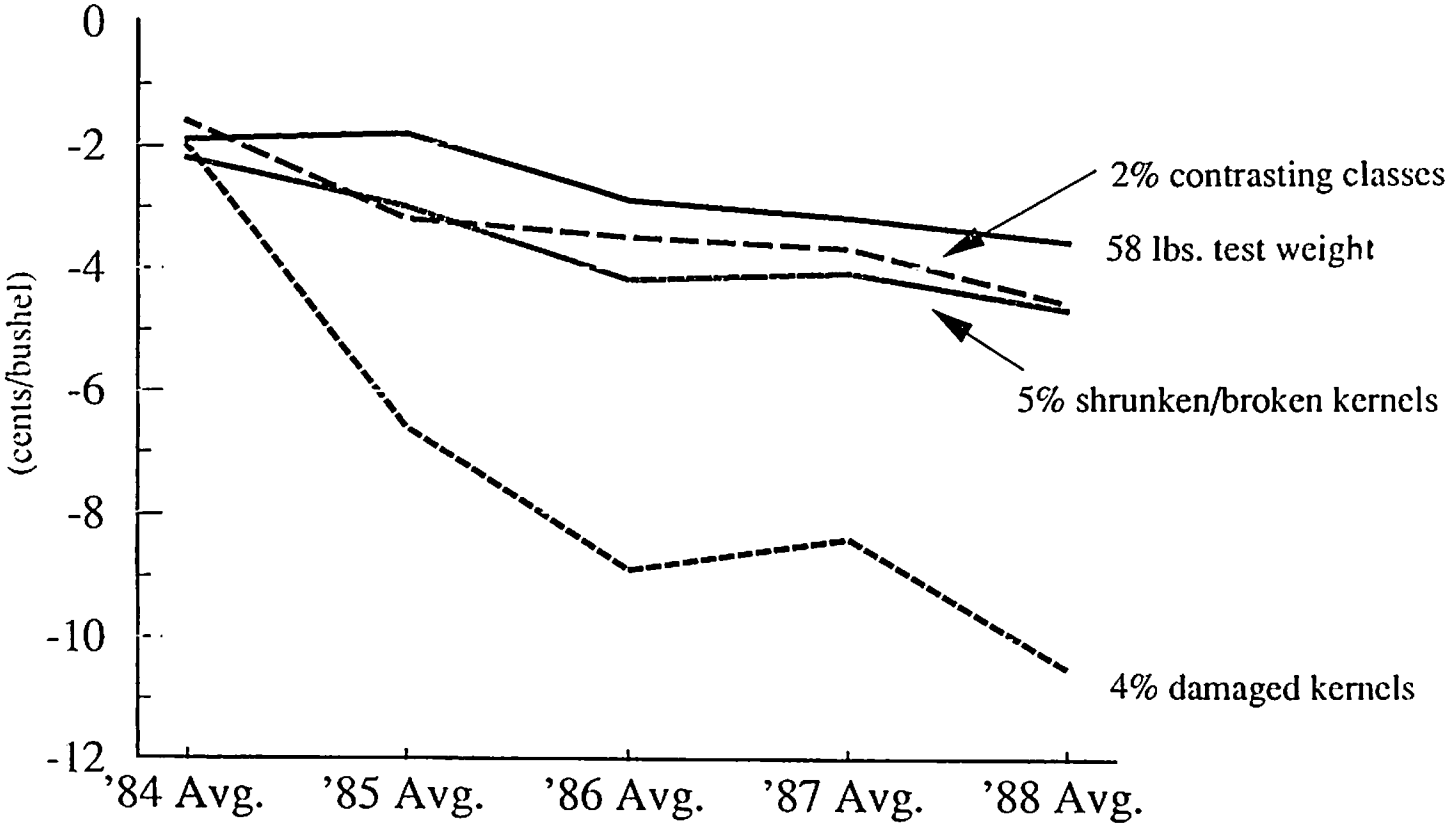
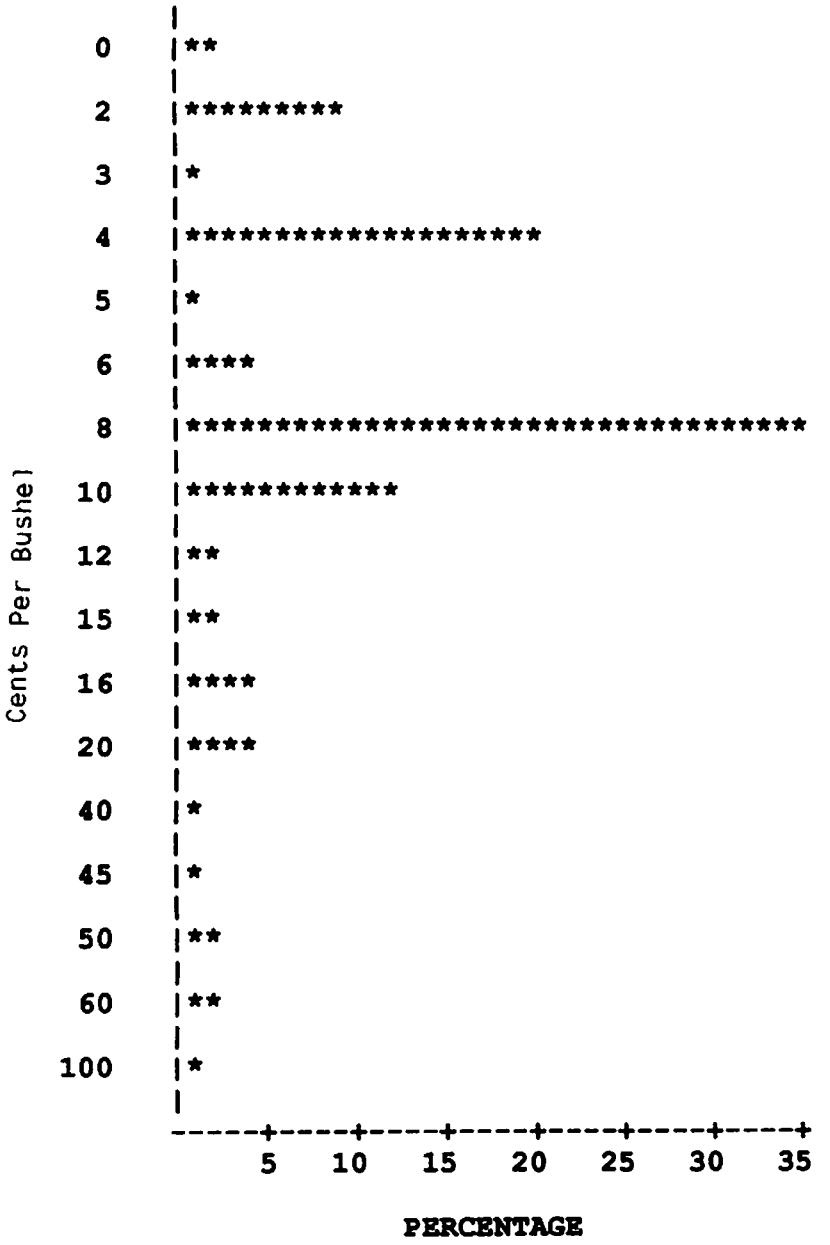
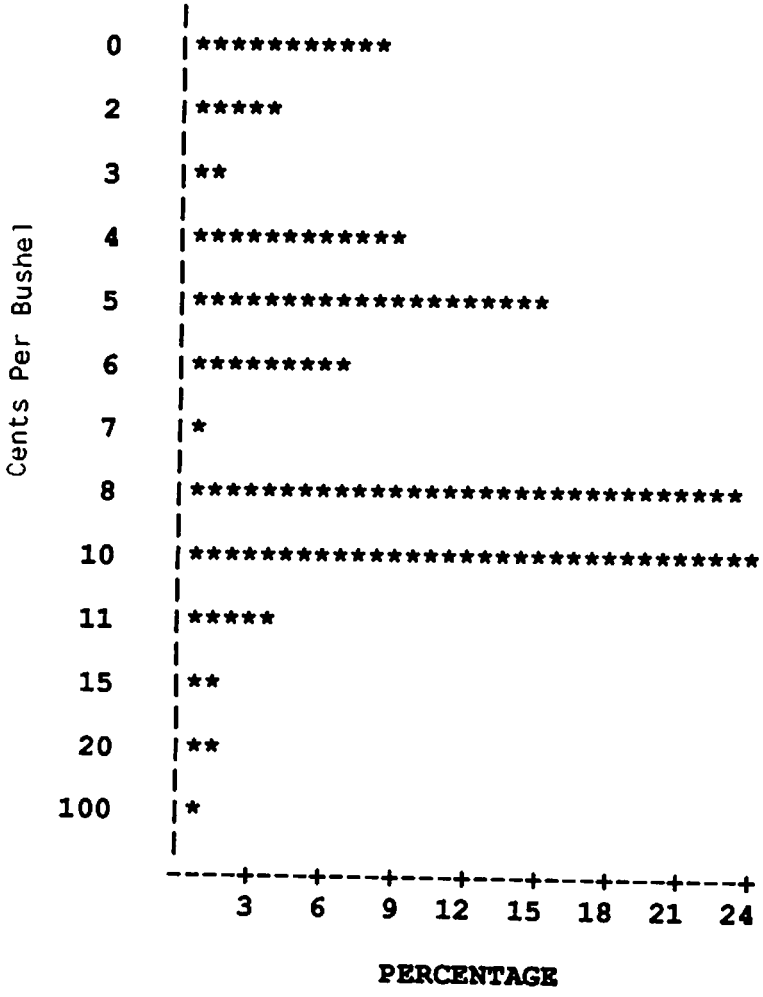


Figure 6. Average Price Adjustments Among North Dakota Country Elevators, HRS (#1 DNS) 14% Protein



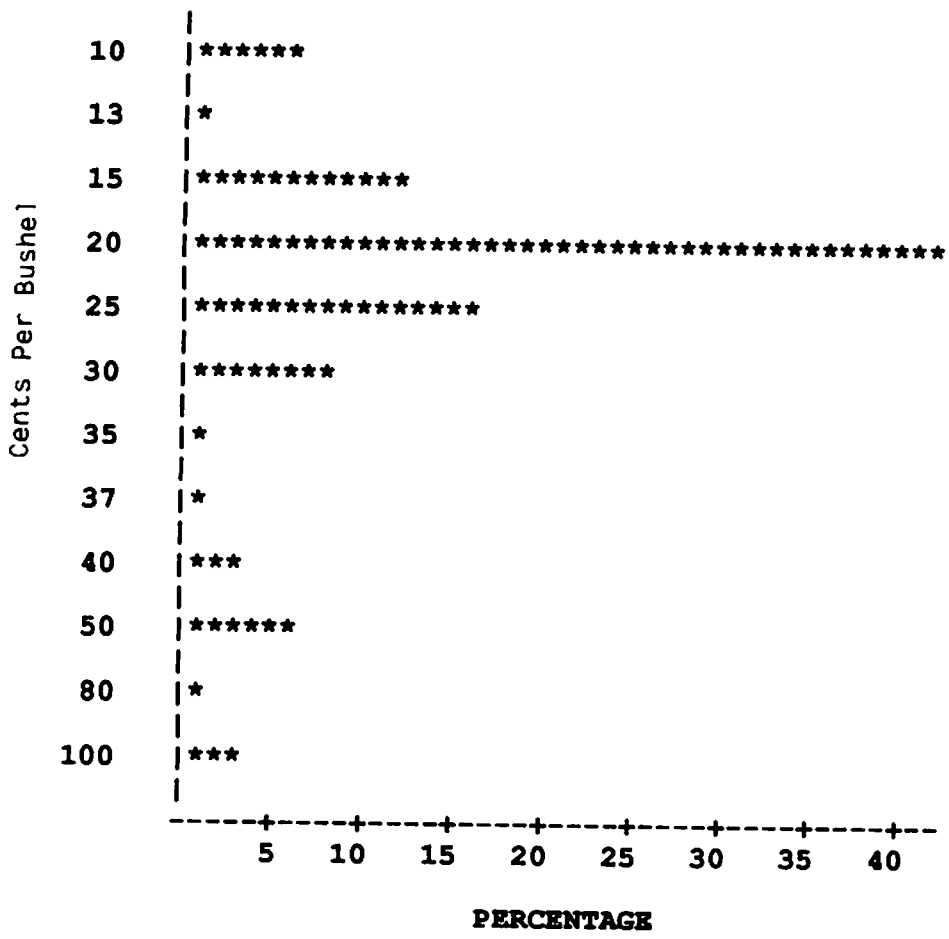
	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
0	2	2	1.77	1.77
2	10	12	8.85	10.62
3	1	13	0.88	11.50
4	23	36	20.35	31.86
5	1	37	0.88	32.74
6	4	41	3.54	36.28
8	39	80	34.51	70.80
10	13	93	11.50	82.30
12	2	95	1.77	84.07
15	2	97	1.77	85.84
16	4	101	3.54	89.38
20	5	106	4.42	93.81
40	1	107	0.88	94.69
45	1	108	0.88	95.58
50	2	110	1.77	97.35
60	2	112	1.77	99.12
100	1	113	0.88	100.00

Figure 7. Frequency of Discounts for 58-lb. Test Weight in Durum Wheat



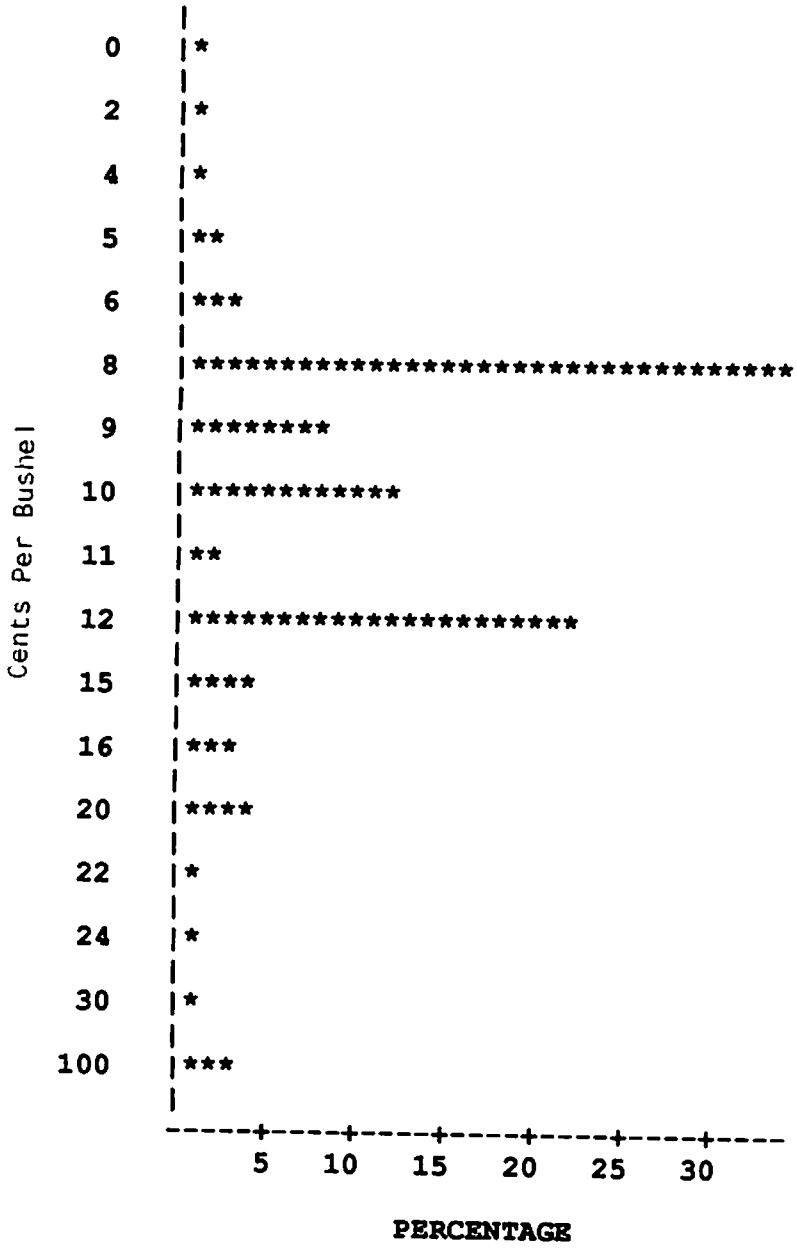
	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
0	9	9	8.26	8.26
2	4	13	3.67	11.93
3	2	15	1.83	13.76
4	10	25	9.17	22.94
5	16	41	14.68	37.61
6	7	48	6.42	44.04
7	1	49	0.92	44.95
8	25	74	22.94	67.89
10	26	100	23.85	91.74
11	4	104	3.67	95.41
15	2	106	1.83	97.25
20	2	108	1.83	99.08
100	1	109	0.92	100.00

Figure 8. Frequency of Discounts for 14.5 Percent Moisture in Durum Wheat



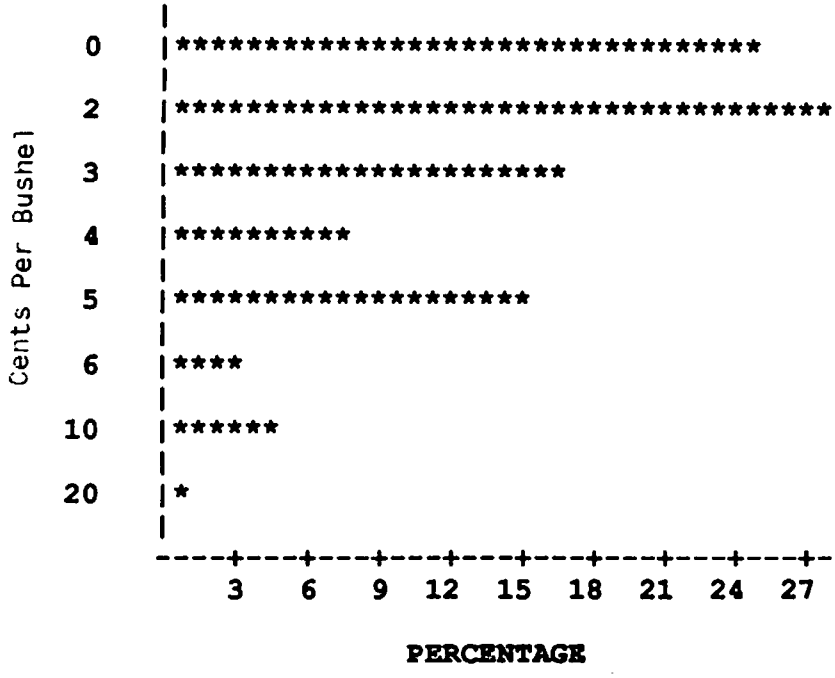
	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
10	7	7	6.31	6.31
13	1	8	0.90	7.21
15	13	21	11.71	18.92
20	47	68	42.34	61.26
25	18	86	16.22	77.48
30	9	95	8.11	85.59
35	1	96	0.90	86.49
37	1	97	0.90	87.39
40	3	100	2.70	90.09
50	7	107	6.31	96.40
80	1	108	0.90	97.30
100	3	111	2.70	100.00

Figure 9. Frequency of Discounts for Amber Durum Wheat



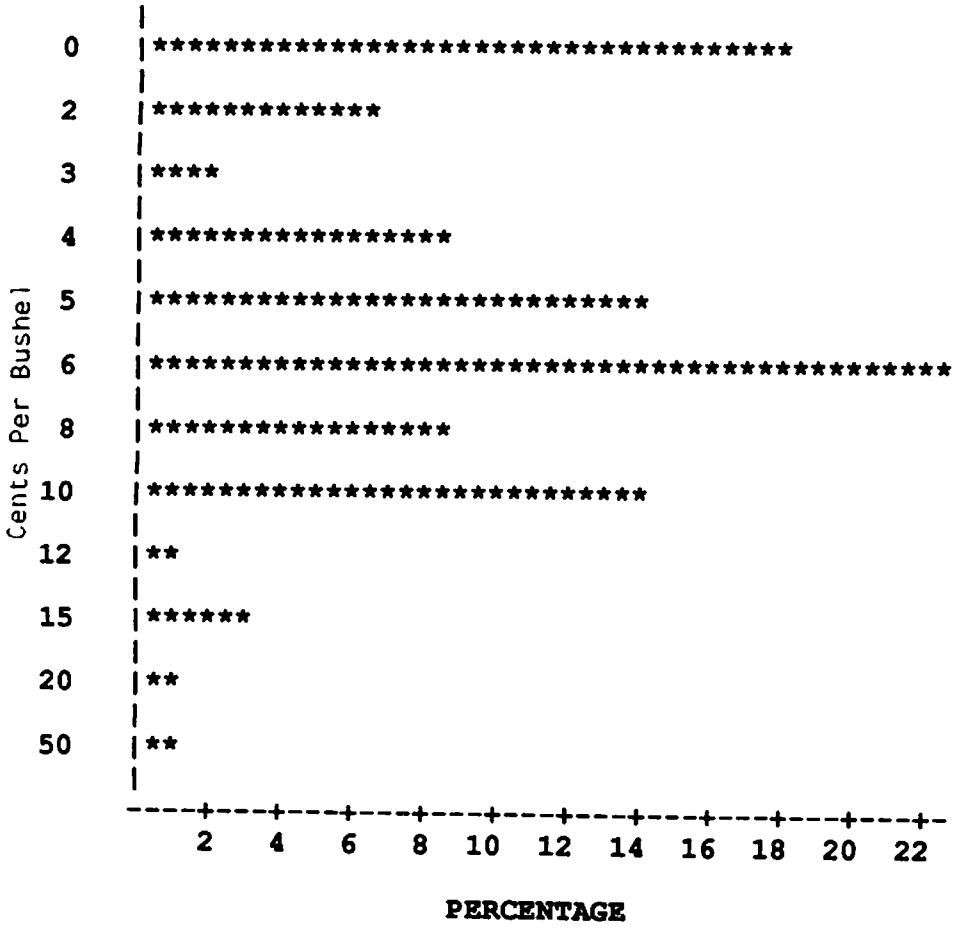
	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
0	1	1	0.89	0.89
2	1	2	0.89	1.79
4	1	3	0.89	2.68
5	2	5	1.79	4.46
6	3	8	2.68	7.14
8	38	46	33.93	41.07
9	9	55	8.04	49.11
10	13	68	11.61	60.71
11	2	70	1.79	62.50
12	25	95	22.32	84.82
15	4	99	3.57	88.39
16	3	102	2.68	91.07
20	4	106	3.57	94.64
22	1	107	0.89	95.54
24	1	108	0.89	96.43
30	1	109	0.89	97.32
100	3	112	2.68	100.00

Figure 10. Frequency of Discounts for 4 Percent Total Damage in Durum Wheat



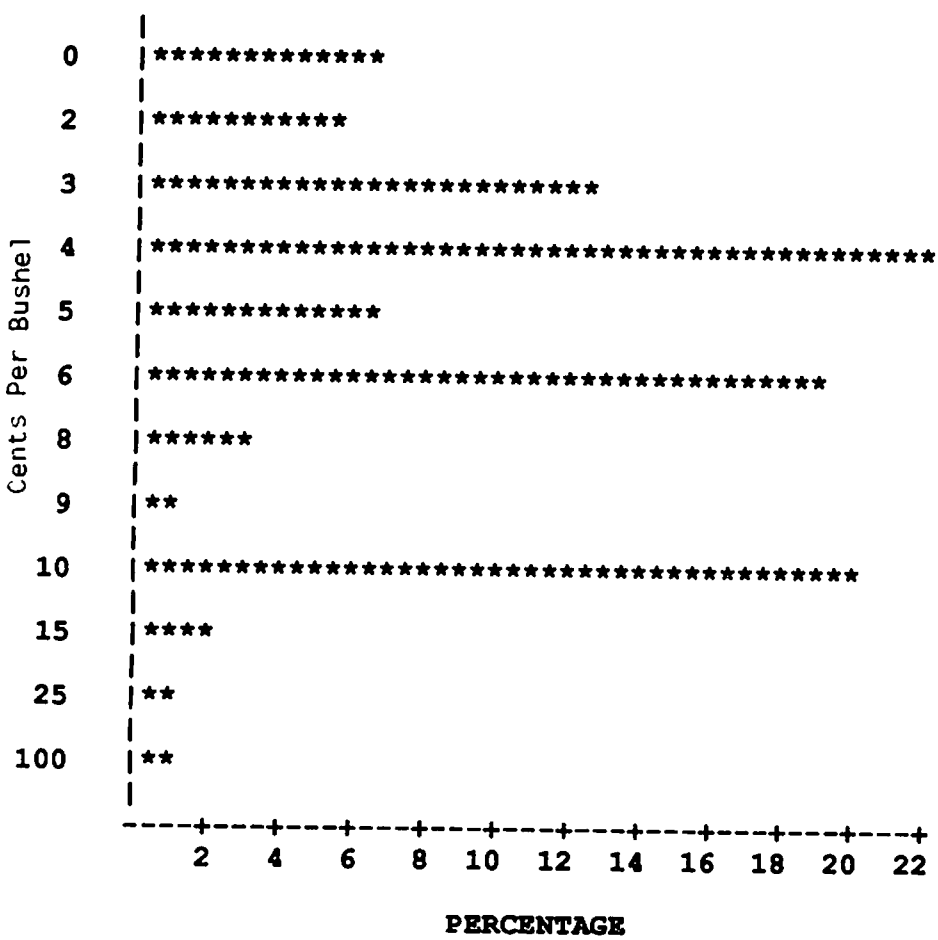
	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
0	23	23	24.73	24.73
2	26	49	27.96	52.69
3	15	64	16.13	68.82
4	7	71	7.53	76.34
5	14	85	15.05	91.40
6	3	88	3.23	94.62
10	4	92	4.30	98.92
20	1	93	1.08	100.00

Figure 11. Frequency of Discounts for 1 Percent Foreign Material in Durum Wheat



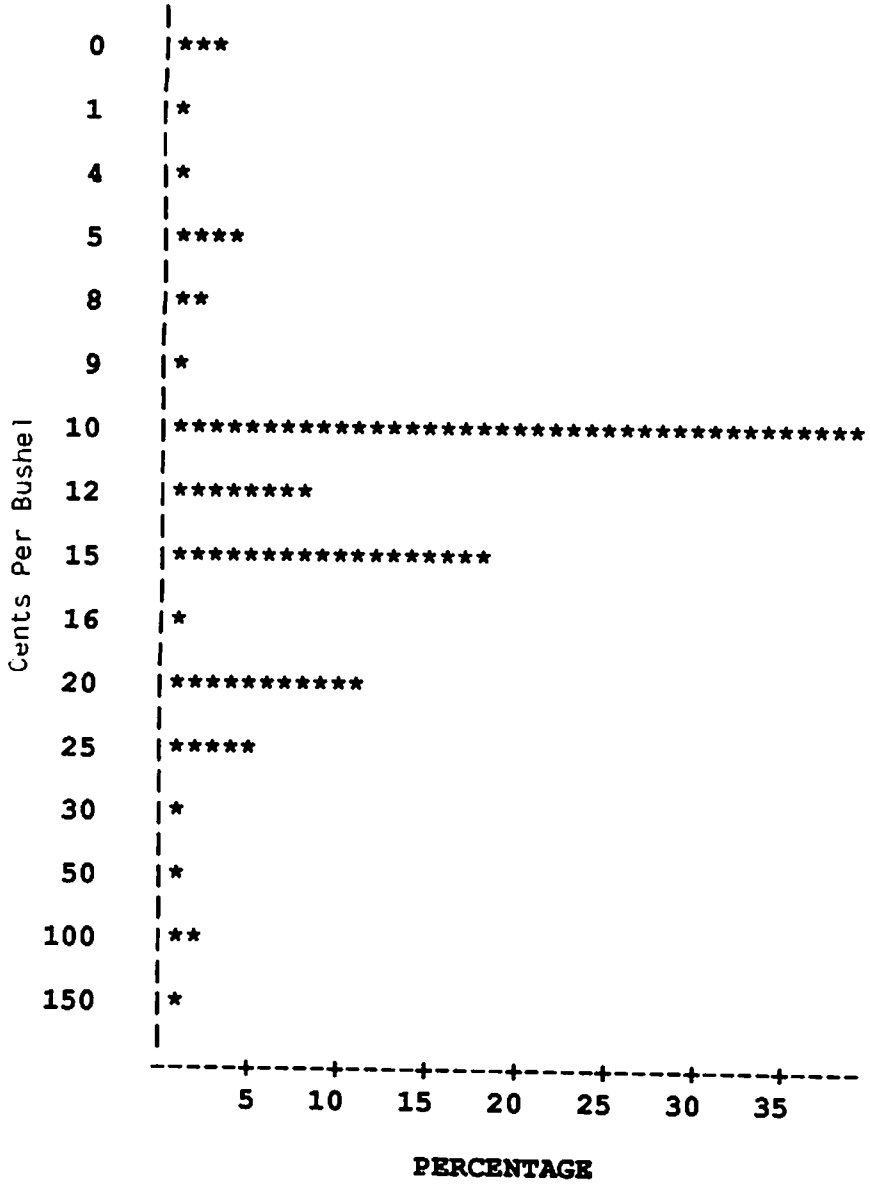
	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
0	17	17	18.09	18.09
2	6	23	6.38	24.47
3	2	25	2.13	26.60
4	8	33	8.51	35.11
5	13	46	13.83	48.94
6	21	67	22.34	71.28
8	8	75	8.51	79.79
10	13	88	13.83	93.62
12	1	89	1.06	94.68
15	3	92	3.19	97.87
20	1	93	1.06	98.94
50	1	94	1.06	100.00

Figure 12. Frequency of Discounts for 5 Percent Shrunken and Broken in Durum Wheat



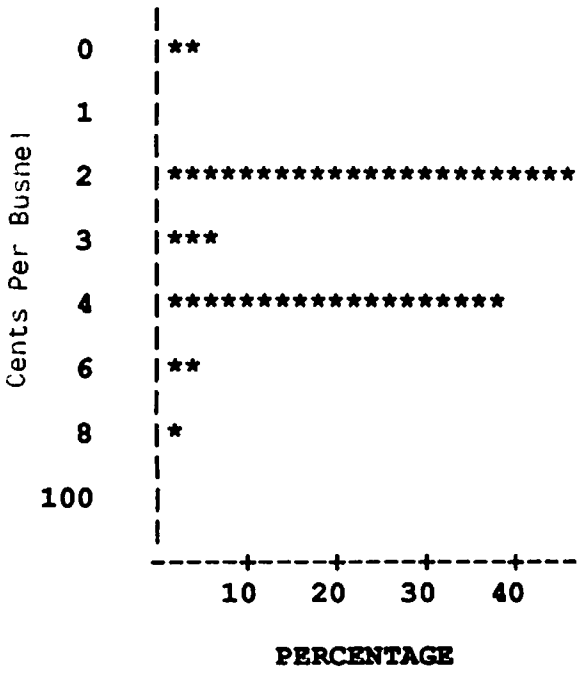
	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
0	7	7	6.67	6.67
2	6	13	5.71	12.38
3	13	26	12.38	24.76
4	23	49	21.90	46.67
5	7	56	6.67	53.33
6	20	76	19.05	72.38
8	3	79	2.86	75.24
9	1	80	0.95	76.19
10	21	101	20.00	96.19
15	2	103	1.90	98.10
25	1	104	0.95	99.05
100	1	105	0.95	100.00

Figure 13. Frequency of Discounts for 2 Percent Contrasting Classes in Durum Wheat



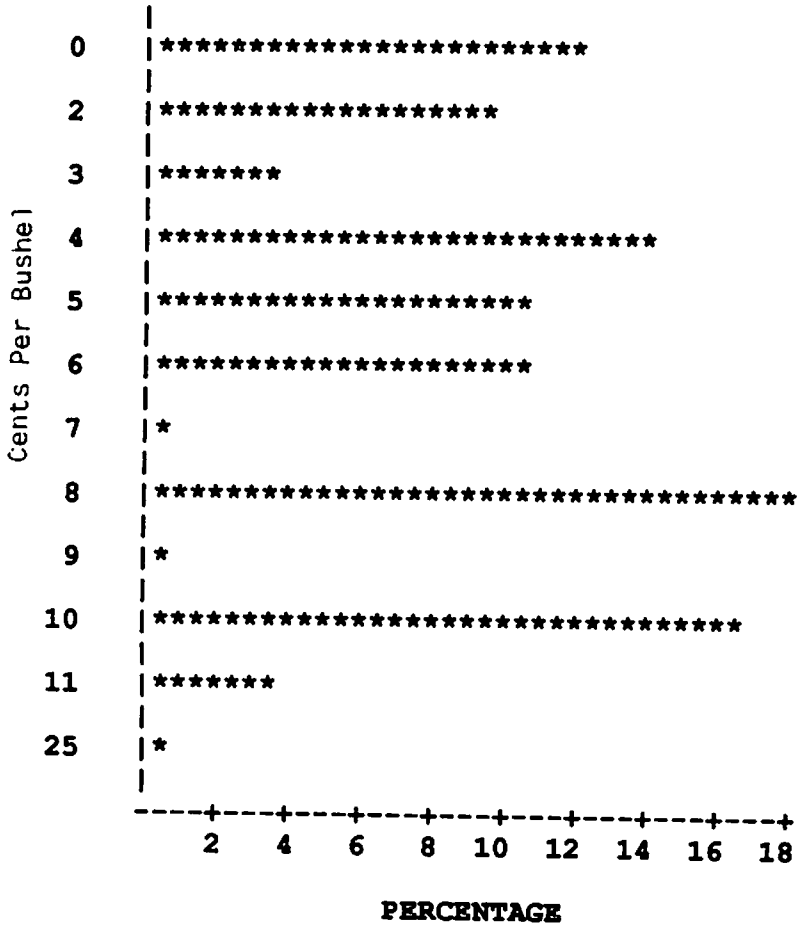
	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
0	3	3	3.03	3.03
1	1	4	1.01	4.04
4	1	5	1.01	5.05
5	4	9	4.04	9.09
8	2	11	2.02	11.11
9	1	12	1.01	12.12
10	39	51	39.39	51.52
12	8	59	8.08	59.60
15	18	77	18.18	77.78
16	1	78	1.01	78.79
20	11	89	11.11	89.90
25	5	94	5.05	94.95
30	1	95	1.01	95.96
50	1	96	1.01	96.97
100	2	98	2.02	98.99
150	1	99	1.01	100.00

Figure 14. Frequency of Discounts for 5 Percent Wheat of Other Classes in Durum Wheat



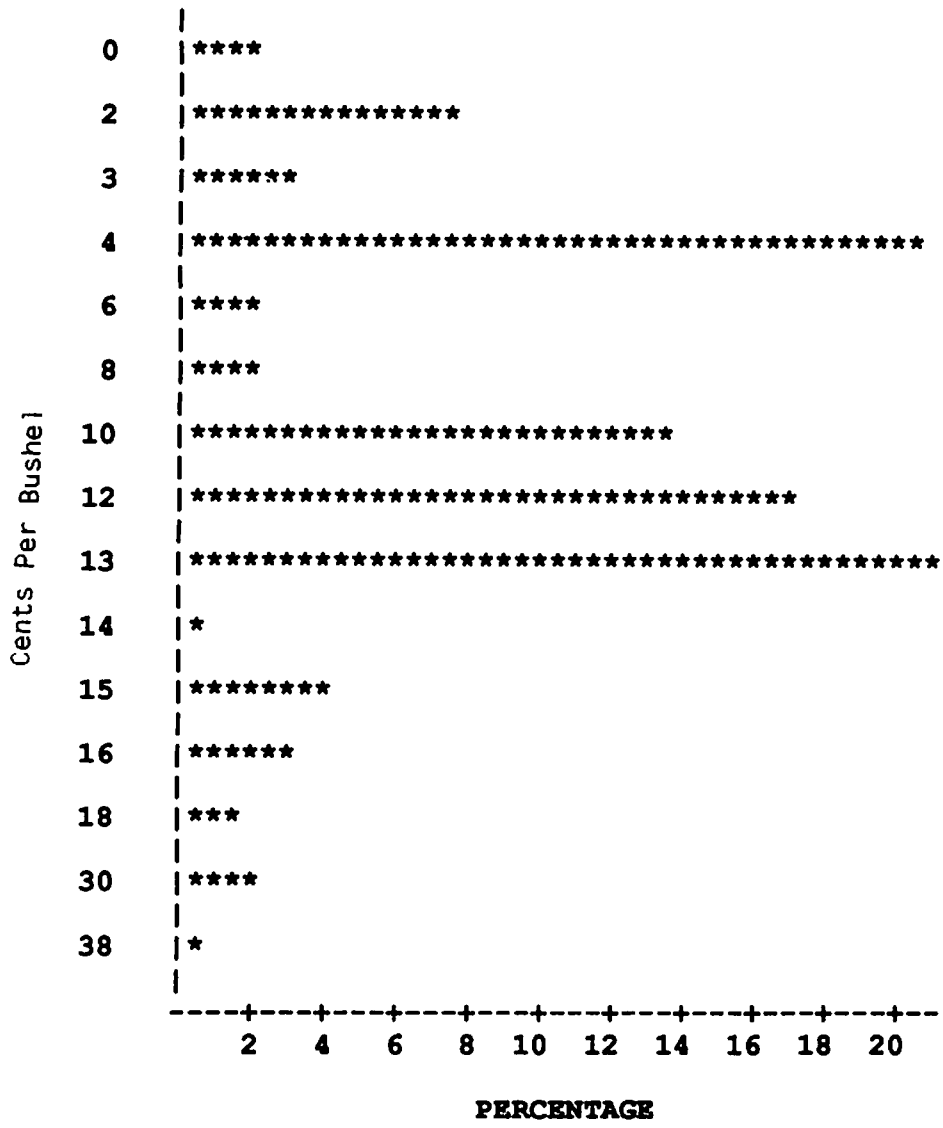
	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
0	7	7	4.86	4.86
1	1	8	0.69	5.56
2	66	74	45.83	51.39
3	8	82	5.56	56.94
4	54	136	37.50	94.44
6	5	141	3.47	97.92
8	2	143	1.39	99.31
100	1	144	0.69	100.00

Figure 15. Frequency of Discounts for 58-lb. Test Weight in HRS Wheat Among Selected Country Elevators in North Dakota



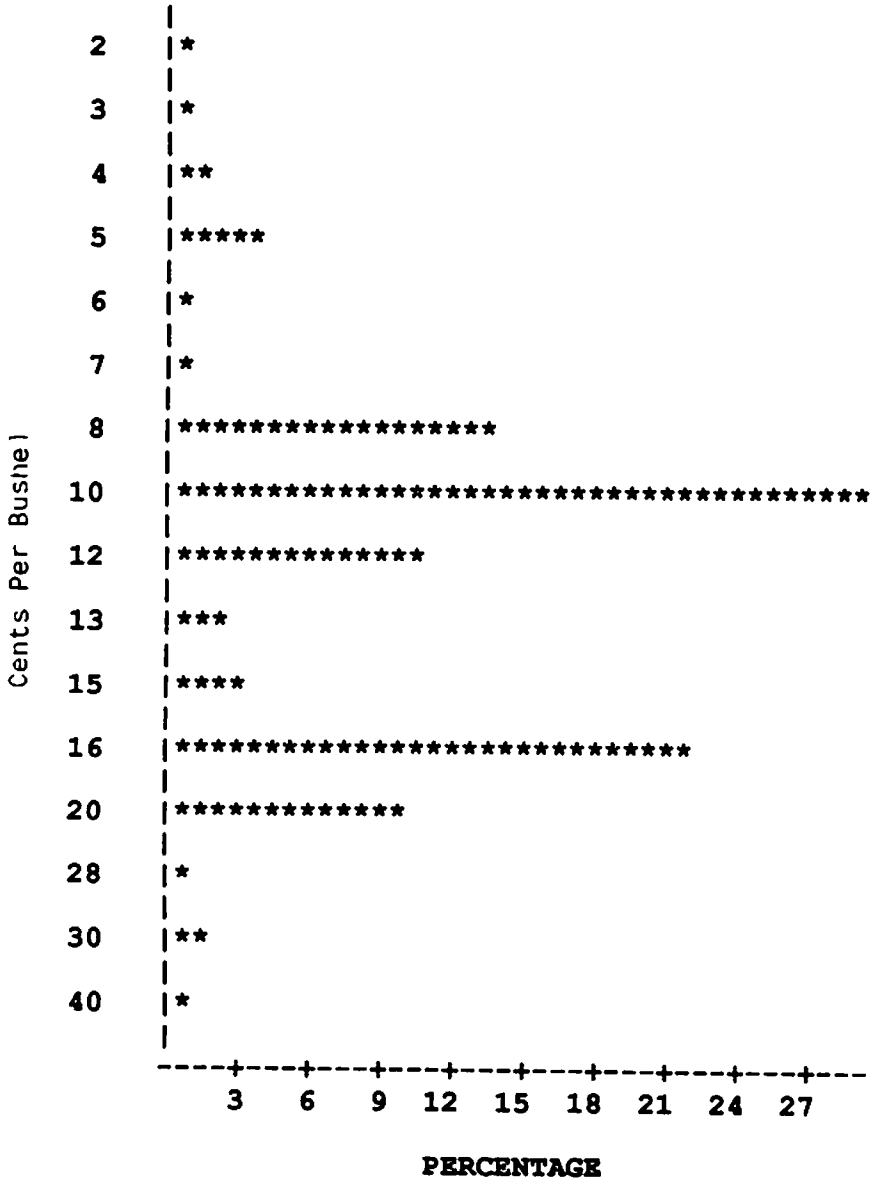
	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
0	16	16	11.85	11.85
2	13	29	9.63	21.48
3	5	34	3.70	25.19
4	19	53	14.07	39.26
5	14	67	10.37	49.63
6	14	81	10.37	60.00
7	1	82	0.74	60.74
8	24	106	17.78	78.52
9	1	107	0.74	79.26
10	22	129	16.30	95.56
11	5	134	3.70	99.26
25	1	135	0.74	100.00

Figure 16. Frequency of Discounts for 14.5 Percent Moisture in HRS Wheat



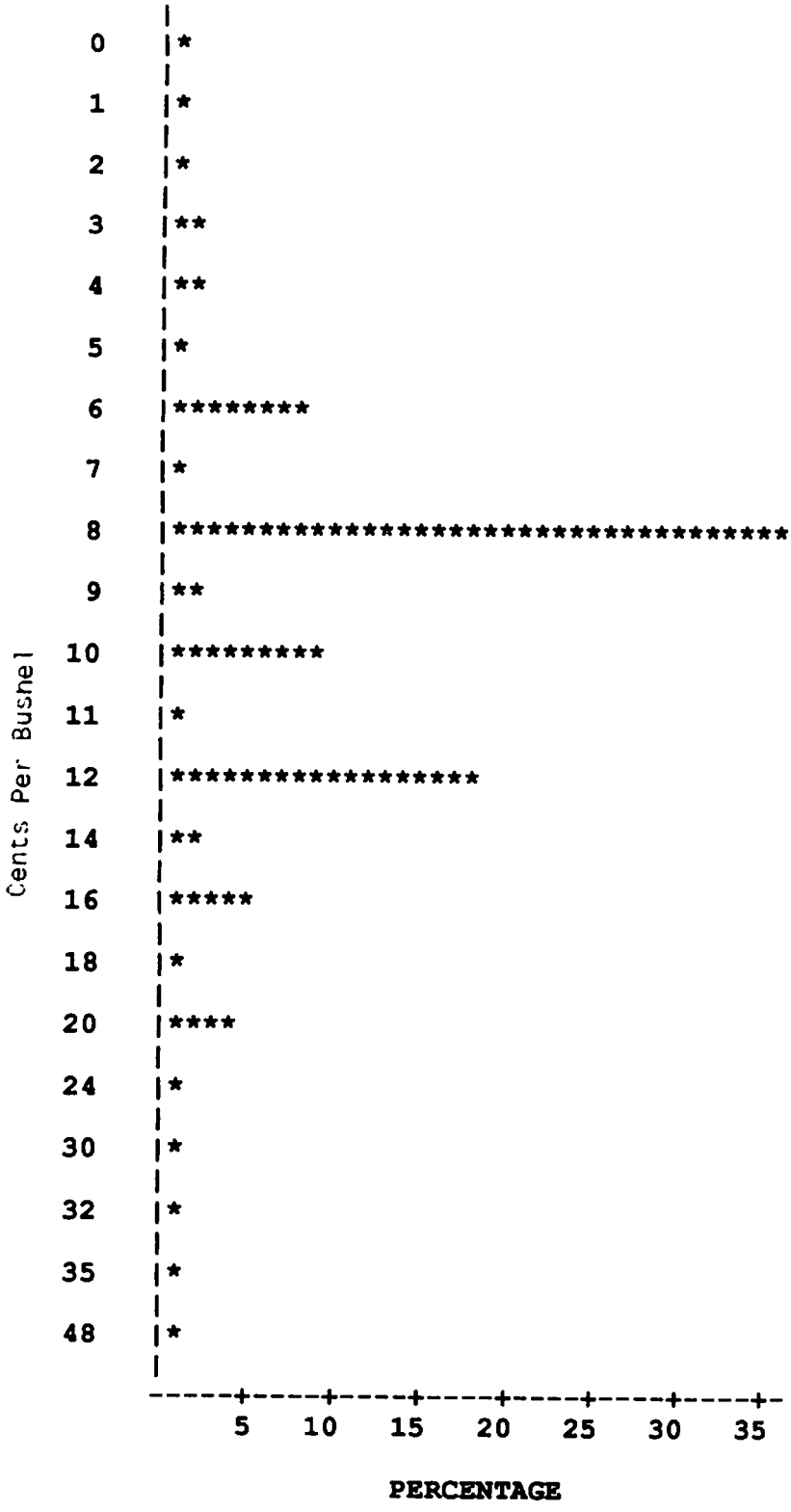
	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
0	3	3	2.10	2.10
2	11	14	7.69	9.79
3	4	18	2.80	12.59
4	29	47	20.28	32.87
6	3	50	2.10	34.97
8	3	53	2.10	37.06
10	19	72	13.29	50.35
12	24	96	16.78	67.13
13	30	126	20.98	88.11
14	1	127	0.70	88.81
15	6	133	4.20	93.01
16	4	137	2.80	95.80
18	2	139	1.40	97.20
30	3	142	2.10	99.30
38	1	143	0.70	100.00

Figure 17. Frequency of Premiums for 16 Percent Protein in HRS Wheat



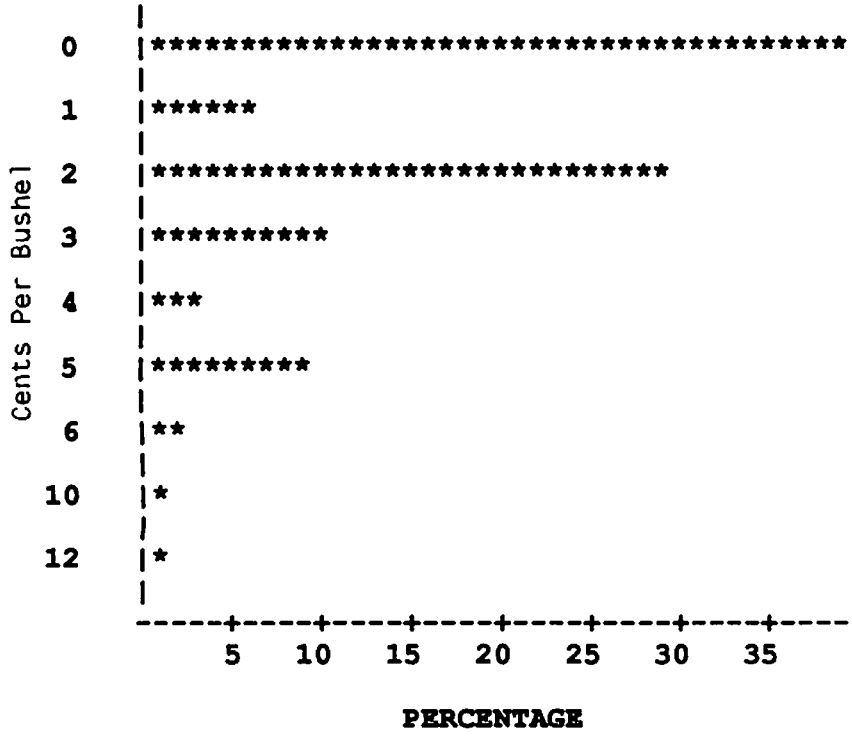
Cents Per Bushel	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
2	1	1	0.70	0.70
3	1	2	0.70	1.40
4	2	4	1.40	2.80
5	5	9	3.50	6.29
6	1	10	0.70	6.99
7	1	11	0.70	7.69
8	19	30	13.29	20.98
10	42	72	29.37	50.35
12	15	87	10.49	60.84
13	3	90	2.10	62.94
15	4	94	2.80	65.73
16	31	125	21.68	87.41
20	14	139	9.79	97.20
28	1	140	0.70	97.90
30	2	142	1.40	99.30
40	1	143	0.70	100.00

Figure 18. Frequency of Discounts for 12 Percent in HRS Wheat



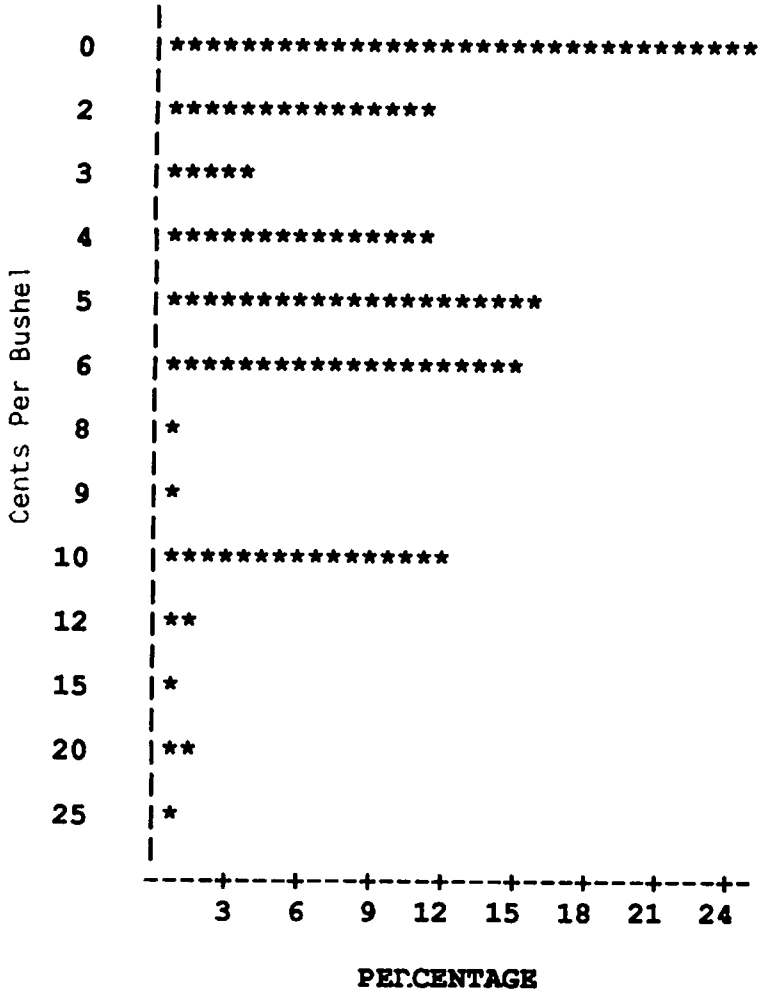
Cents Per Bushel	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
0	2	2	1.41	1.41
1	1	3	0.70	2.11
2	2	5	1.41	3.52
3	3	8	2.11	5.63
4	3	11	2.11	7.75
5	1	12	0.70	8.45
6	12	24	8.45	16.90
7	1	25	0.70	17.61
8	51	76	35.92	53.52
9	3	79	2.11	55.63
10	13	92	9.15	64.79
11	1	93	0.70	65.49
12	26	119	18.31	83.80
14	3	122	2.11	85.92
16	7	129	4.93	90.85
18	1	130	0.70	91.55
20	5	135	3.52	95.07
24	2	137	1.41	96.48
30	2	139	1.41	97.89
32	1	140	0.70	98.59
35	1	141	0.70	99.30
48	1	142	0.70	100.00

Figure 19. Frequency of Discounts for 4 Percent Total Damage in HRS Wheat



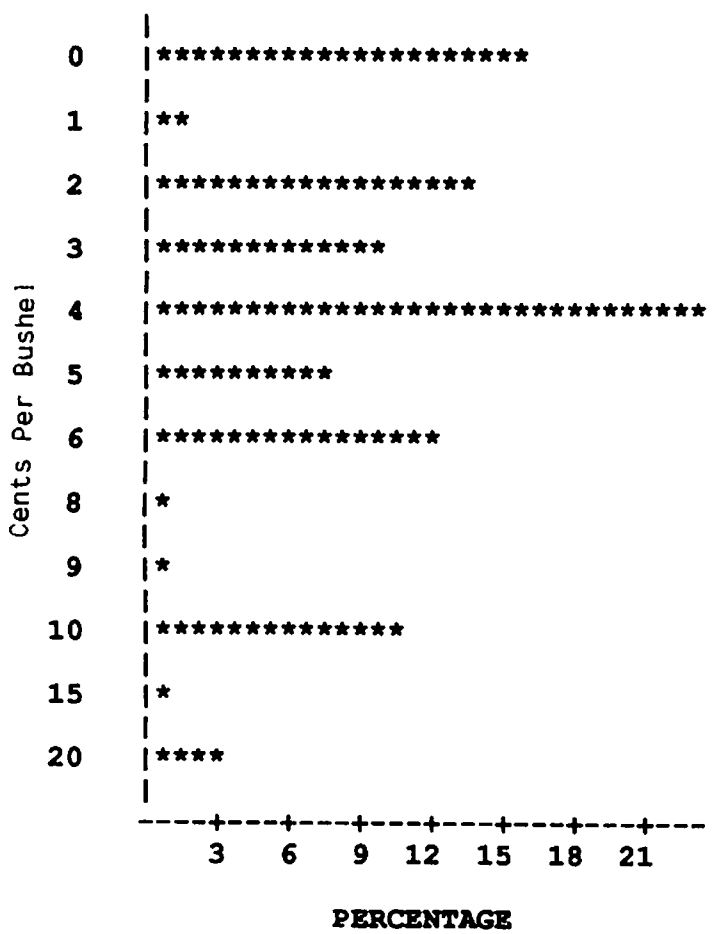
	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
0	44	44	39.29	39.29
1	7	51	6.25	45.54
2	33	84	29.46	75.00
3	11	95	9.82	84.82
4	3	98	2.68	87.50
5	10	108	8.93	96.43
6	2	110	1.79	98.21
10	1	111	0.89	99.11
12	1	112	0.89	100.00

Figure 20. Frequency of Discounts for 1 Percent Foreign Material in HRS Wheat



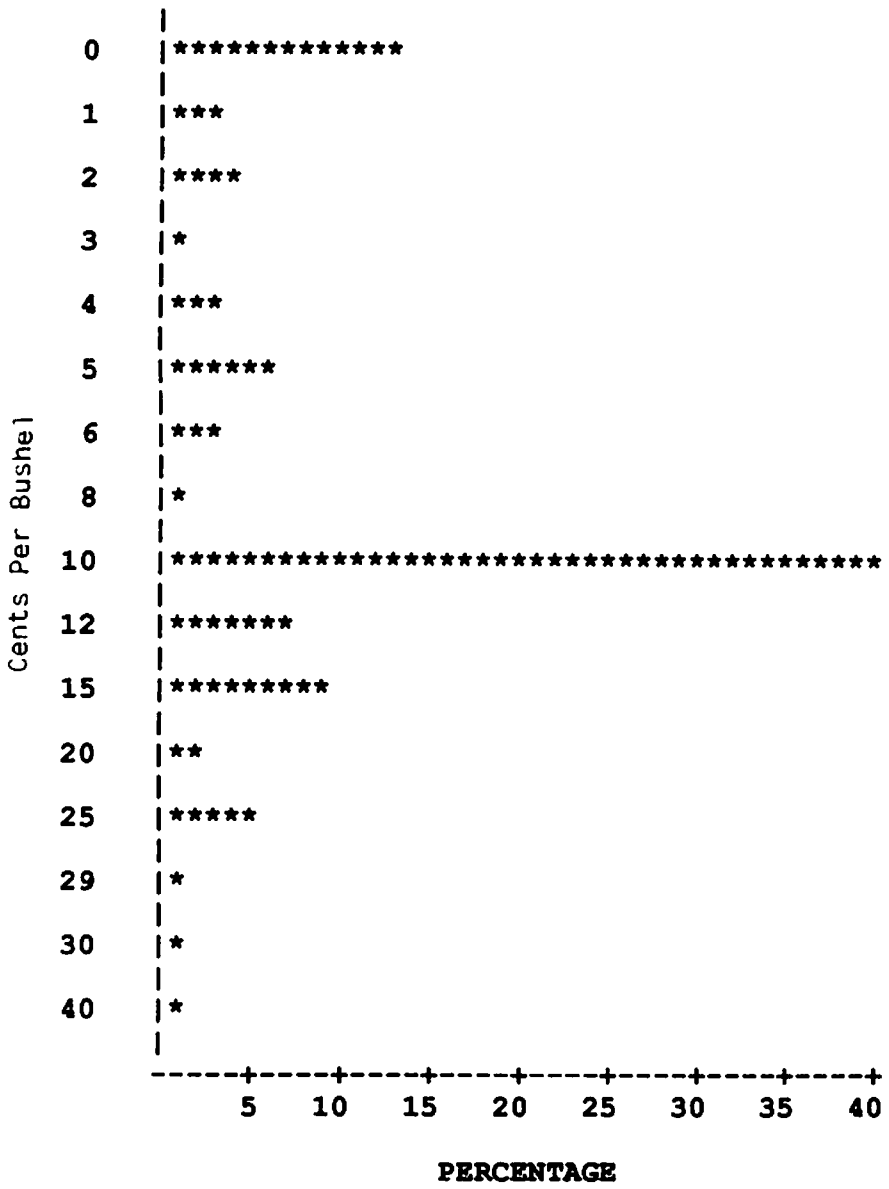
Cents Per Bushel	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
0	27	27	24.77	24.77
2	12	39	11.01	35.78
3	4	43	3.67	39.45
4	12	55	11.01	50.46
5	17	72	15.60	66.06
6	16	88	14.68	80.73
8	1	89	0.92	81.65
9	1	90	0.92	82.57
10	13	103	11.93	94.50
12	2	105	1.83	96.33
15	1	106	0.92	97.25
20	2	108	1.83	99.08
25	1	109	0.92	100.00

Figure 21. Frequency of Discounts for 5 Percent Shrunken and Broken in HRS Wheat



	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
0	19	19	15.45	15.45
1	2	21	1.63	17.07
2	17	38	13.82	30.89
3	12	50	9.76	40.65
4	29	79	23.58	64.23
5	9	88	7.32	71.54
6	15	103	12.20	83.74
8	1	104	0.81	84.55
9	1	105	0.81	85.37
10	13	118	10.57	95.93
15	1	119	0.81	96.75
20	4	123	3.25	100.00

Figure 22. Frequency of Discounts for 2 Percent Contrasting Classes in HRS Wheat



	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
0	15	15	12.82	12.82
1	3	18	2.56	15.38
2	5	23	4.27	19.66
3	1	24	0.85	20.51
4	4	28	3.42	23.93
5	7	35	5.98	29.91
6	4	39	3.42	33.33
8	1	40	0.85	34.19
10	47	87	40.17	74.36
12	8	95	6.84	81.20
15	11	106	9.40	90.60
20	2	108	1.71	92.31
25	6	114	5.13	97.44
29	1	115	0.85	98.29
30	1	116	0.85	99.15
40	1	117	0.85	100.00

Figure 23. Frequency of Discounts for 5 Percent Wheat of Other Classes in HRS Wheat

Appendix C

GRAIN MARKETING QUESTIONNAIRE

(Fall 1988)

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 sold your durum and HRS wheat through and the approximate percentage of sales to each (over the past year)?

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. North Dakota Mill	_____	_____
j. _____	_____	_____

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

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

   Harvest_____ Postharvest_____

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

11. To what dockage percentage level do you clean your wheat?

    Harvest_____ Postharvest_____

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

13. To whom do you sell most of your screenings to? _____

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

15. What was your board price for #1 Hard Amber Durum (milling) on November 1, 1988? _____

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 (-)	
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 1, 1988? _____

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

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