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Pricing Adjustments for Durum and HRS Wheat in North Dakota (1985)

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Highlights

Premiums and discounts are important factors in the pricing of durum and HRS wheat since they are used as an indication for the demand for various quality levels. In this report the premium and discounts used by country elevators for durum and HRS wheat in the fall of 1985 are examined. The premiums and discounts for 1985 are also compared to those of 1984. The premiums and discounts were then examined for significant differences by location in the state, organizational structure, loadout capacity, distance to competition, storage capacity, and board price. Finally, the economics of cleaning wheat for 1985 were examined and compared to 1984.

The authors express their appreciation to the country elevator managers who responded to the mail survey. Without their help this study could not have been completed.

PRICING ADJUSTMENTS FOR DURUM AND HRS WHEAT IN NORTH DAKOTA (1985)

Steven P. Gunn and William W. Wilson*

Introduction

An important pricing factor in the marketing of durum and HRS wheat is the variability in quality. Premiums and discounts are an indication of the value placed by the market on various quality levels for durum and HRS wheat. The price adjustments (premiums and discounts) are determined in the market by the relative supply and demand of various quality levels of the particular commodity. The level of quality for durum and HRS wheat is measured by a set of grade and nongrade factors. Country elevators communicate the market determined price adjustments for each factor between destination markets and producers.

In this study country elevator managers in North Dakota were surveyed to document the price adjustments used for durum and HRS wheat as of November 1, 1985. The price adjustment questionnaire was mailed to 528 country elevators in North Dakota. The questionnaire also contained questions about the general characteristics of the responding elevators and the economics of cleaning wheat. Appendix C contains the questionnaire used in the survey.

A similar study of the pricing adjustments for durum and HRS wheat used by country elevators was conducted in 1984. The 1984 study was more comprehensive of the pricing and marketing practices of North Dakota country elevators than the 1985 study. The results of the 1984 study are available from the Department of Agricultural Economics, North Dakota State University. The results of the 1985 study are presented in this report.

General Characteristics of Participating Elevators

A diverse mixture of elevators participated in the 1985 study. The elevators participating varied in their location in the state, organizational stucture, loadout capacity, distance to competition, storage capacity, board price for durum and HRS wheat, and commission companies and track buyers used. The general characteristics of the elevators participating are presented in Figure 1 and Tables 1-7.[1]

Pricing Adjustments for Durum and HRS Wheat by North Dakota Elevators

Pricing adjustments were collected for grade and nongrade factors for durum and HRS wheat. Grade factors which are used to determine numerical grade. Nongrade factors are also used to indicate the quality of wheat. Grade factors used for both durum and HRS wheat are test weight, damaged

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[1]All figures will be in Appendix A and all tables will be in Appendix B.

kernels, foreign material, shrunken and broken kernels, contrasting classes, and wheat of other classes. The base grades used were "No. 1 Hard Amber Durum" and "No. 1 Dark Northern Spring, 14 percent protein." The managers were asked to list the price adjustments used for each of the above grade factors from the base grade down to the minimal acceptable level for No. 2 grade. The managers were also asked to give their price adjustments for 14.5 percent moisture durum and HRS wheat, 12 and 16 percent protein HRS wheat, and "amber durum."

Most of the price adjustments for the 1985 Durum and HRS wheat crops averaged higher than those of the 1984 crops. The average high and low price adjustments for 1985 and 1984 durum and HRS wheat are presented in Table 8. All but four price adjustments averaged the same or higher in 1985 than 1984; those four are 1 percent foreign material and 5 percent shrunken and broken kernels for durum and 57 lb. test weight and 1 percent foreign material for HRS wheat. Part of the reason for differences in price adjustments between 1984 and 1985 is the difference in quality of the 1984 and 1985 durum and HRS wheat crops (Table 9). Price discounts had a tendency to be higher when the quality was lower between the two years. For example, durum in 1984 averaged 11.5 percent moisture while durum averaged 12.9 percent moisture for 1985. The higher moisture coincides with higher moisture discounts.

The range between high and low price adjustments indicates that the elevators varied considerably in their pricing adjustments. The frequency distributions given in Figures 2-18 indicate the dispersion of pricing adjustments for each factor. The distribution of responses varied among factors. Test weight discounts tended to have the smallest dispersion while protein price adjustments tended to have the widest dispersion of responses.

Analysis of the Price Adjustment Responses

The price adjustment responses were analyzed for significant differences by location in the state, organizational structure, loadout capacity, distance to competition, storage capacity, and board price. The price adjustments for each category were averaged, then compared to determine the relationship between the price adjustments in each category.[2]

Most of the price adjustment averages were similar among regions; however, some significant differences in price adjustment averages were found (Table 10). Only eight of the factors had significant differences between regional price adjustment averages and only five factors had more than two regional price adjustment averages which were significantly different. The average discount for 4 percent damaged durum in Region 6 was significantly higher than that of Region 2. Region 7 had a significantly higher average discount for durum with 5 percent wheat of other classes than did Region 3. The average discount for HRS wheat with 14.5 percent moisture was significantly higher in Region 2 than that in Region 4. Significant differences were found between the price adjustment averages for more than two regions for HRS wheat with 16 percent protein, 12 percent protein, 5 percent

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[2]A two-tailed statistical test with a .025 significance level was used for each test for significance.

shrunken and broken kernels, 2 percent contrasting classes, and 5 percent wheat of other classes. The price adjustment averages for each region which are significantly different are indicated in Tables 11-15. The price adjustment averages in the west regions were significantly lower than those in the east for 12 and 16 percent protein HRS wheat. Price adjustment averages for 12 and 16 percent protein HRS wheat were significantly different between eastern and western North Dakota in 1984 also. The fact that HRS wheat grown in western North Dakota tends to be higher in protein than that grown in eastern North Dakota and that the destination markets for HRS wheat for eastern and western HRS wheat are different explains the difference in protein price adjustment averages. No pattern could be determined among the other factors.

The price adjustment averages varied little among elevators with cooperative and private organizational structures (Table 16). Only three significant differences in price adjustment averages were found between elevators with different organizational structures. Significant differences in price adjustment averages were found for durum with 14.5 percent moisture, durum with 2 percent contrasting classes, and HRS wheat with 2 percent contrasting classes. The cooperatives in each case had significantly higher average discounts than the privates.

The price adjustment averages varied little among elevators with different loadout capacities (Table 17). Only three significant differences in price adjustment averages were found between elevators with different loadout capacities. The three loadout capacity catagories used were 6 cars or less per day, from 7 to 26 cars per day, and more than 26 cars day. Significant differences in price adjustment averages were found for HRS wheat with 12 percent protein, 1 percent foreign material, and 5 percent shrunken and broken kernels. In each case the significant difference was found between elevators with loadout capacities of 6 or less cars per day and from 7 to 26 cars per day. The higher loadout capacity had significantly higher average discounts for 12 percent protein while the lower loadout capacity had significantly higher average discounts for 1 percent foreign material and 5 percent shrunken and broken kernels.

No significant differences were found among price adjustment averages among elevators with different distances to their nearest competition. The distance to competition categories used were less than 1 mile, from 1 to 5 miles, from 6 to 10 miles, and over 10 miles. The price adjustment averages for each category are given in Table 18. No significant differences were found between price adjustment averages between elevators with different storage capacities. The storage capacity categories used were 300,000 bushels and less and over 300,000 bushels. The price adjustment averages for each category are given in Table 19.

The price adjustment averages for elevators with high and low board prices were compared for significant differences. To correct for the differences in prices between eastern and western North Dakota, the elevators were divided into east and west sections. The dividing line was Highway 3, which runs north and south between Dunseith and Ashley. The average price for durum and HRS wheat in each region was used to divide high and low price. Most of the average price adjustments between high and low price elevators were not significant (Table 20). The only price adjustment averages for durum found

significantly different was for durum with 14.5 percent moisture among elevators in the west. In that region low board price elevators had higher average discounts for 14.5 percent moisture durum. Six price adjustment averages for HRS wheat were found to be significantly different between elevators with high and low board prices. Significant differences were found for HRS wheat with 14.5 percent moisture, 16 percent protein, 12 percent protein, 1 percent foreign material, 5 percent shrunken and broken kernels, and 2 percent contrasting classes. All of the significant differences in price adjustment averages for HRS wheat were found among elevators in the east region. All of the average price adjustments were higher for the low board price elevators except 16 and 12 percent protein. The results indicate that elevators with low board price tended to have higher price adjustment averages.

Economics of Cleaning Wheat

Managers were also asked questions about the economics of cleaning wheat. Of the 218 elevators responding, 213 cleaned wheat prior to shipment. Those elevators cleaning wheat could clean an average of 1,455 bushels/hour with a range of 200 to 12,000 bushels/hour. At harvest time the managers called incoming wheat clean at an average of 2.2 percent dockage. After harvest the managers called incoming wheat clean at an average of 1.9 percent dockage. Sixty-one managers indicated that they called incoming wheat clean at a lower dockage level after harvest than during harvest. During harvest the managers would clean wheat down to an average of 0.8 percent dockage. After harvest they would clean wheat down to an average of 0.7 percent dockage. Thirty-two managers indicated they cleaned wheat down to a lower dockage level after harvest than during harvest.

The costs of cleaning, the price of wheat screenings, the dockage level of the wheat, and the cost of transportation are the main factors determining the economics of cleaning wheat. The average cleaning costs were around 4.2 cents/bushel among the responses. Wheat screenings prices averaged $33.19/ton (see Table 21). Table 21 contains the average, high, and low estimated cleaning cost and wheat screenings prices for 1984 and 1985. Average screenings prices have gone down and average cleaning costs have risen according to the responses. This would indicate that if transportation and dockage levels remain the same, cleaning wheat is less profitable in 1985 than 1984.

The economics of cleaning wheat were examined by using selected cleaning costs and price for wheat screenings. Using the following equation:

$$(W)(D)(S + T) - (CW) = \text{net profit from cleaning},$$

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

the net profit from cleaning was calculated. Table 22 contains the results from calculating the net profit from cleaning as the percentage of dockage, cost of cleaning, and price of wheat screenings are varied. The values used

for each of the above factors determined the range in which cleaning wheat was profitable. These figures in Table 22 are fairly gross averages and should not be used as managerial decisions. The profitability of cleaning wheat depends on the costs of transportation, cleaning, and the price for wheat screenings each of which varies by elevators. The assumption of cleaning down to 0.0 percent dockage instead of 0.5 or 1.0 percent also affects the profitability of cleaning wheat.

Summary and Conclusions

Elevators responding to the survey varied considerably by location in the state, organizational structure, loadout capacity, distance to competition, storage capacity, board price for durum and HRS wheat, and the commission companies and track buyers used. The price adjustments used by the elevators for durum and HRS wheat for each factor also had wide ranges. Although the price adjustment responses did vary few significant differences in price adjustment averages existed between location, organizational structure, loadout capacity distance to competition, storage capacity, and board price for durum and HRS wheat. The number of factors in which price adjustment averages were significantly different between categories were location (8), organizational structure (3), loadout capacity (3), distance to competition (0), storage capacity (0), and board price (7). The only patterns recognized between the price adjustment averages were that protein price adjustments for HRS wheat were higher in eastern North Dakota than in western North Dakota. In addition, on selected factors, low board price elevators tended to have higher price adjustment averages for HRS wheat than high board price elevators in eastern North Dakota. The price adjustment averages used in 1985 were higher for most of the price adjustment averages used in 1984.

The economics of cleaning wheat were also examined in the study. Using selected responses the net profit from cleaning wheat was calculated. Profitability of cleaning wheat was dependent on the cost of cleaning, the price of screenings, the cost of transportation, and the dockage level in the wheat. The increase in average cleaning costs and the decrease in average screening prices between 1985 and 1984 indicates that cleaning wheat was less profitable in 1985 than in 1984.

Appendix A

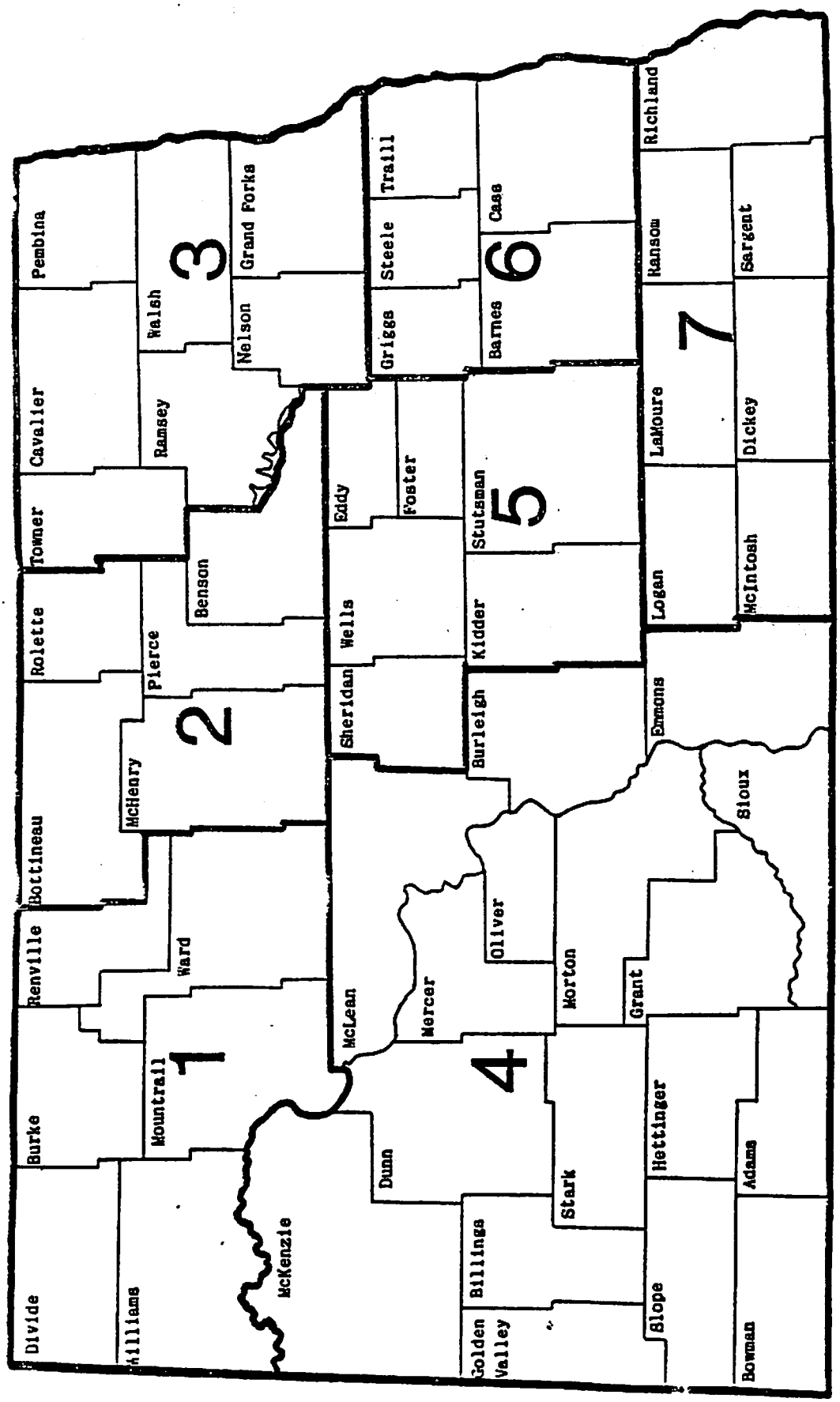


Figure 1. Seven Regions Used to Divide Responding Elevators by Location in the State.

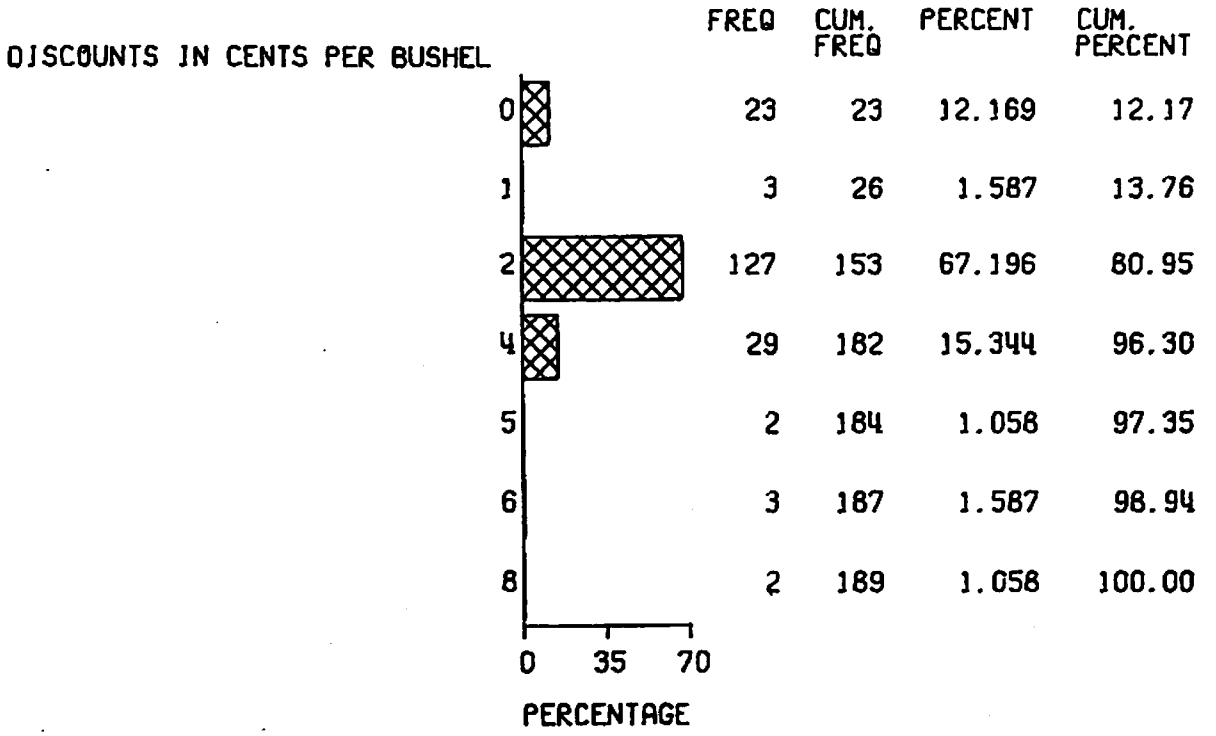
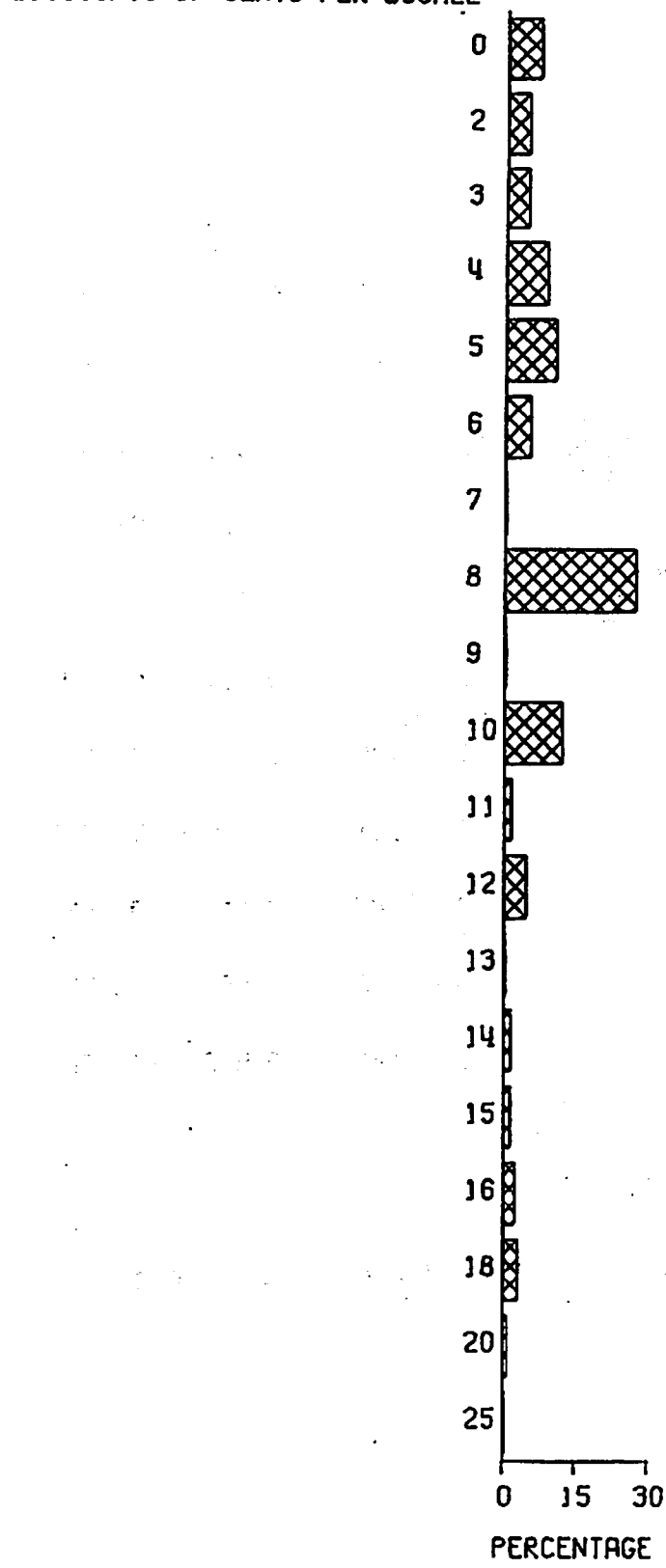


Figure 2. Frequency of Test Weight Discounts for 58 lb. Durum Among Selected Country Elevators in North Dakota



DISCOUNTS IN CENTS PER BUSHEL	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
0	14	14	7.407	7.4074
2	9	23	4.762	12.1693
3	9	32	4.762	16.9312
4	17	49	8.995	25.9259
5	20	69	10.582	36.5079
6	10	79	5.291	41.7989
7	1	80	0.529	42.3280
8	52	132	27.513	69.8413
9	1	133	0.529	70.3704
10	23	156	12.169	82.5397
11	3	159	1.587	84.1270
12	9	168	4.762	88.8889
13	1	169	0.529	89.4180
14	3	172	1.587	91.0053
15	3	175	1.587	92.5926
16	5	180	2.646	95.2381
18	6	186	3.175	98.4127
20	2	188	1.058	99.4709
25	1	189	0.529	100.0000

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

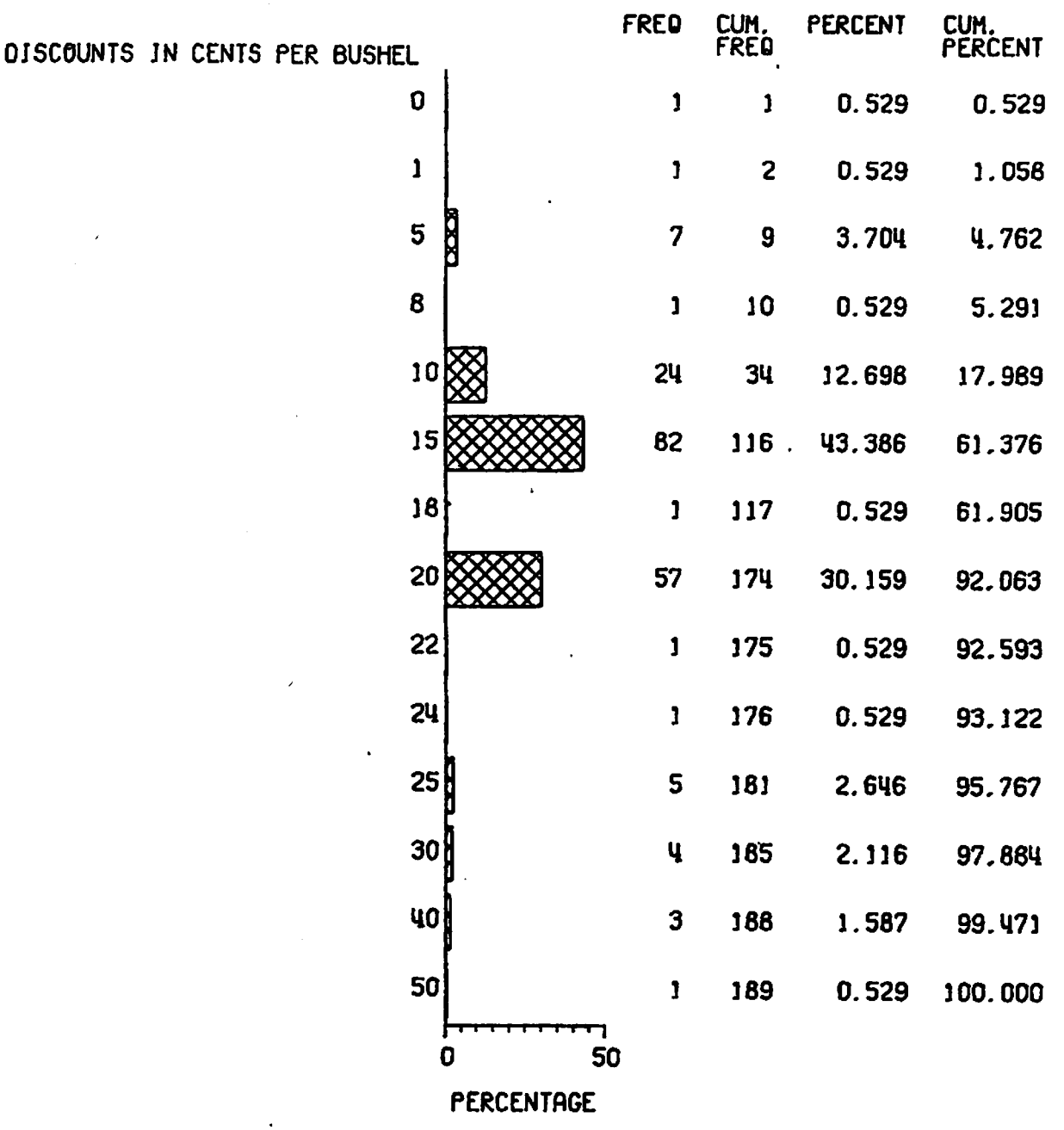


Figure 4. Frequency of Color Discounts for Durum (Amber Durum) Among Selected Country Elevators in North Dakota

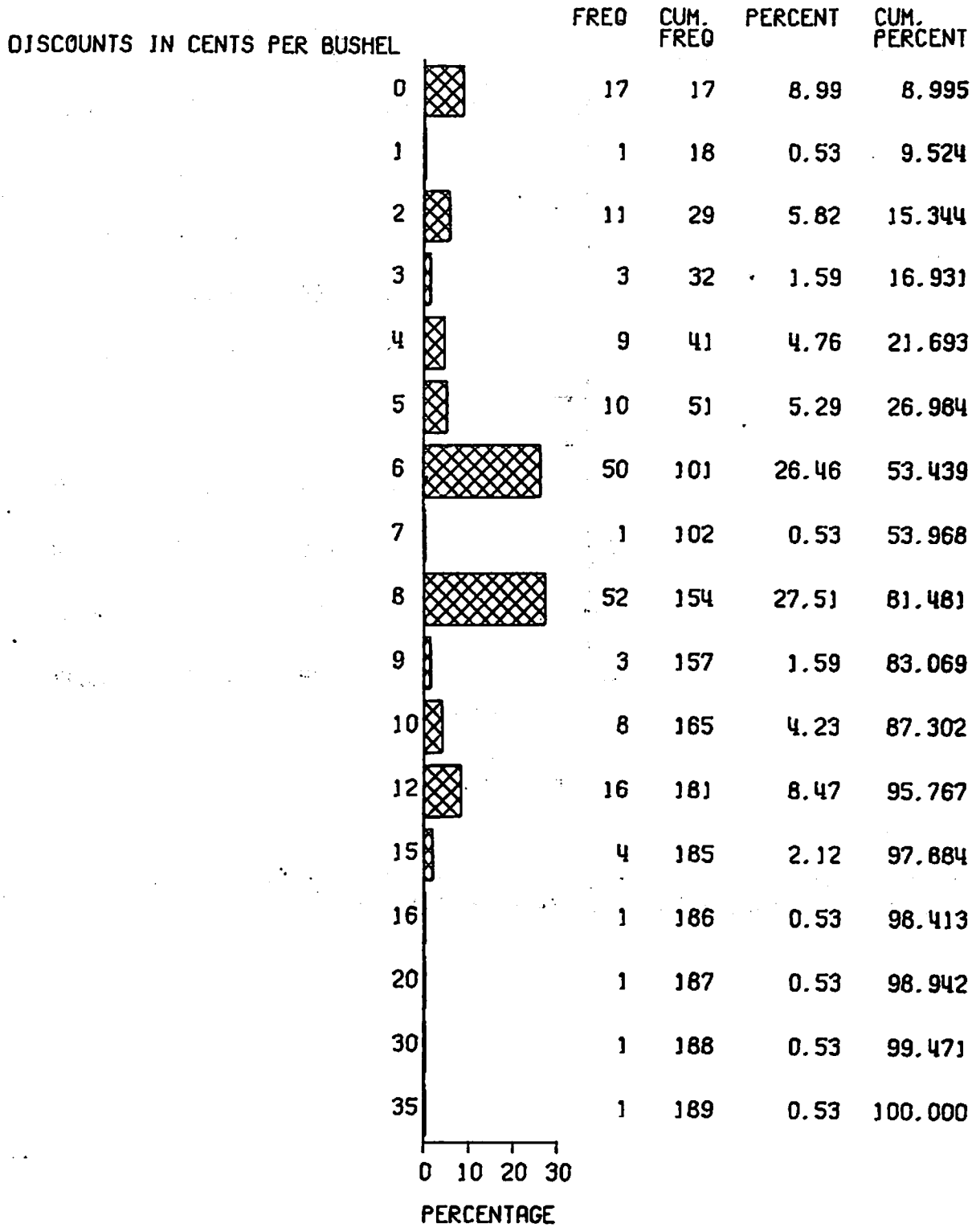


Figure 5. Frequency of Damage Discounts for 4 Percent Total Damage Durum Among Selected Country Elevators in North Dakota

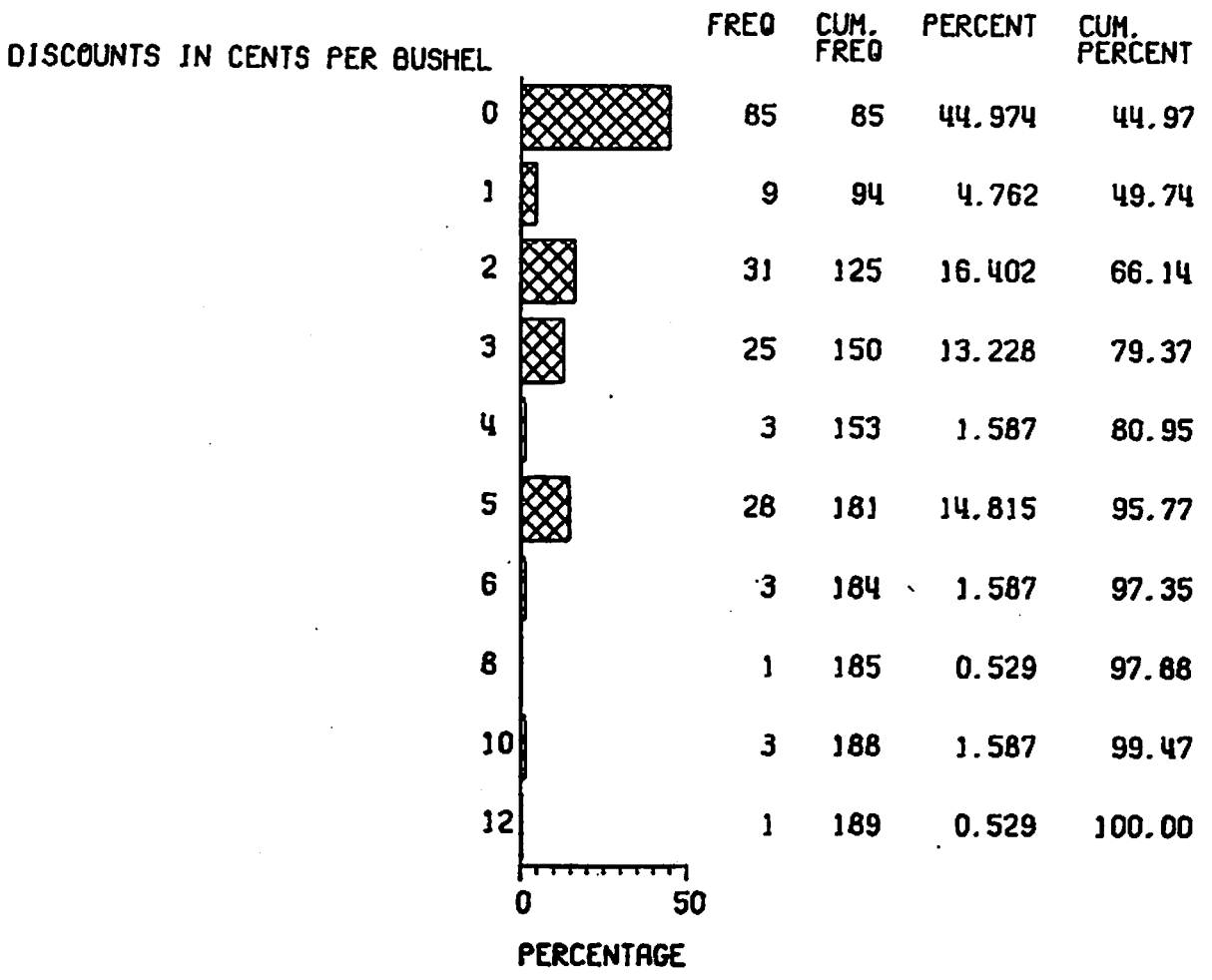
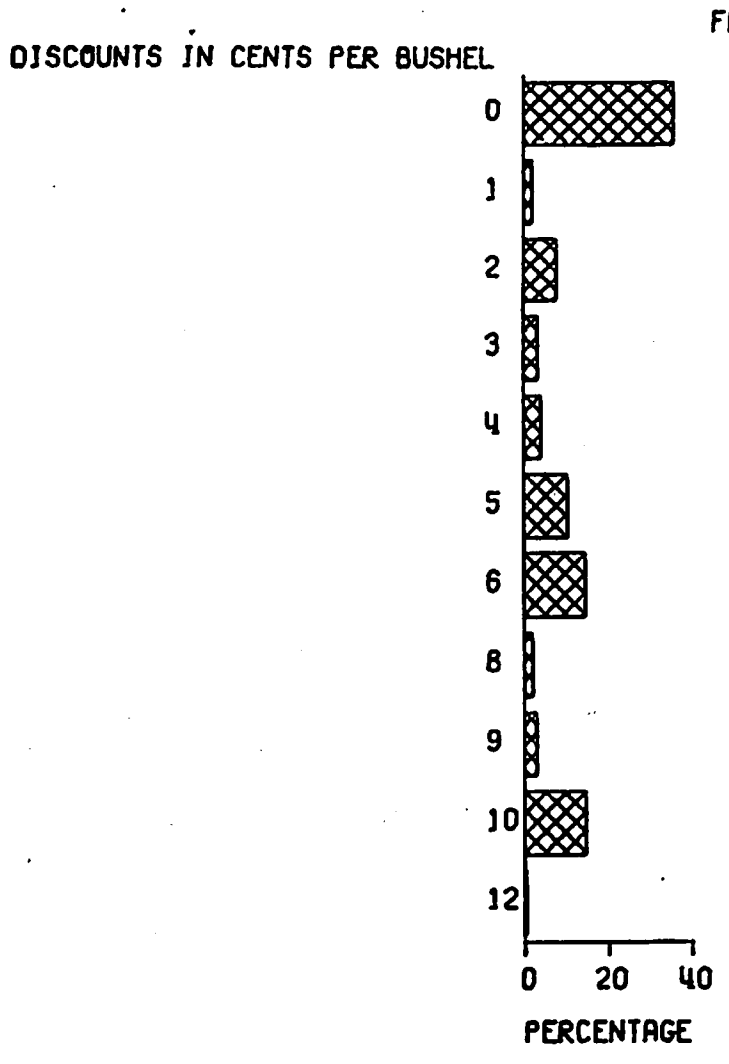


Figure 6. Frequency of Discounts for 1 Percent Foreign Material Durum Among Selected Country Elevators in North Dakota



DISCOUNTS IN CENTS PER BUSHEL	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
0	68	68	35.979	35.979
1	4	72	2.116	38.095
2	15	87	7.937	46.032
3	7	94	3.704	49.735
4	8	102	4.233	53.968
5	20	122	10.582	64.550
6	28	150	14.815	79.365
8	4	154	2.116	81.481
9	6	160	3.175	84.656
10	28	188	14.815	99.471
12	1	189	0.529	100.000

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

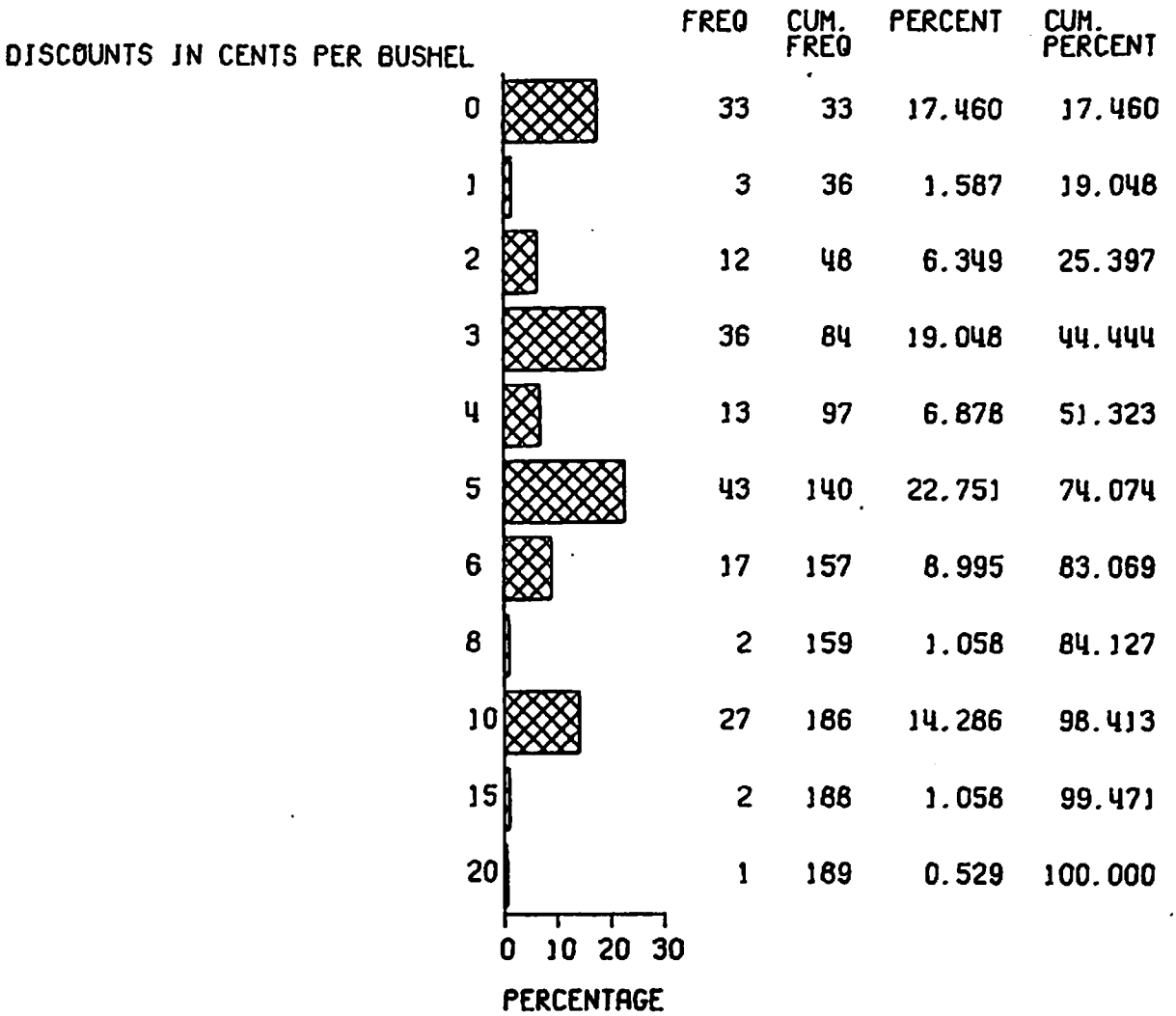
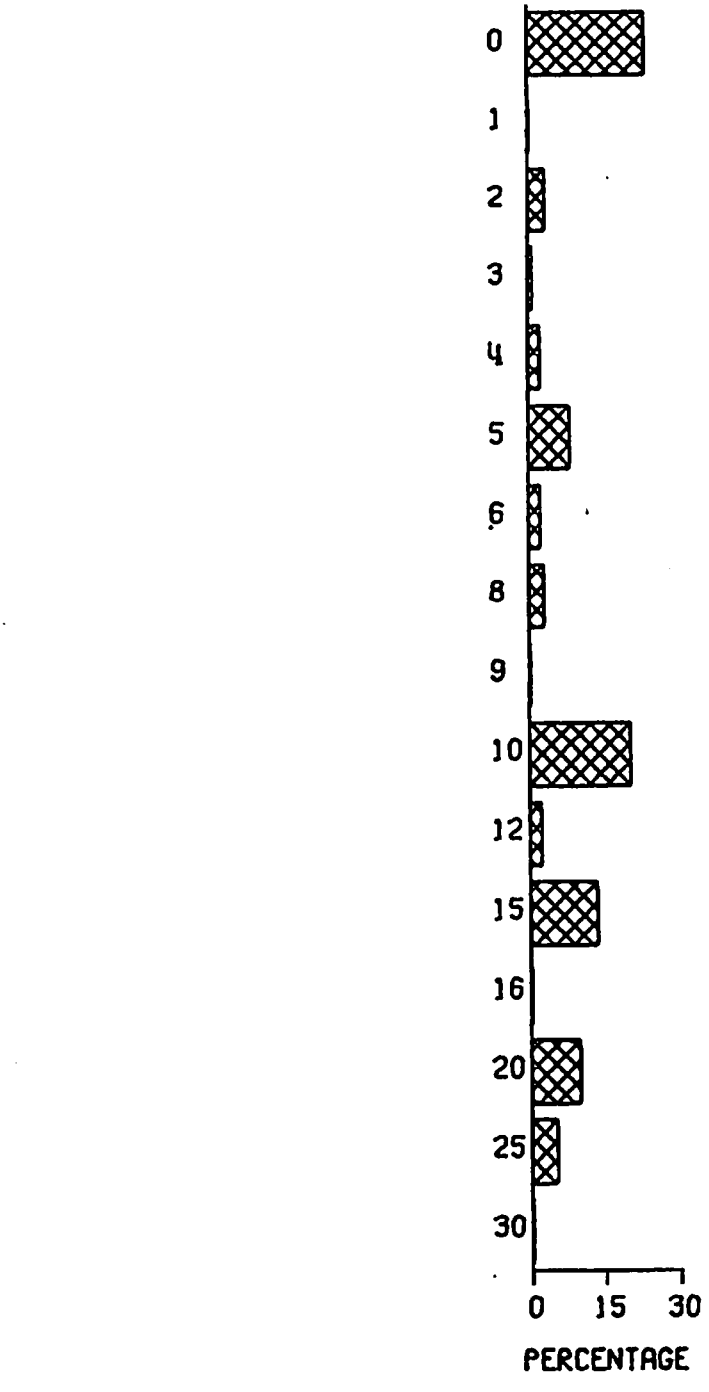


Figure 8. Frequency of Discounts for 2 Percent Contrasting Classes Durum Among Selected Country Elevators in North Dakota



DISCOUNTS IN CENTS PER BUSHEL	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
0	45	45	23.810	23.8095
1	1	46	0.529	24.3386
2	7	53	3.704	28.0423
3	2	55	1.058	29.1005
4	5	60	2.646	31.7460
5	16	76	8.466	40.2116
6	5	81	2.646	42.8571
8	6	87	3.175	46.0317
9	1	88	0.529	46.5608
10	39	127	20.635	67.1958
12	5	132	2.646	69.8413
15	26	158	13.757	83.5979
16	1	159	0.529	84.1270
20	19	178	10.053	94.1799
25	10	188	5.291	99.4709
30	1	189	0.529	100.0000

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

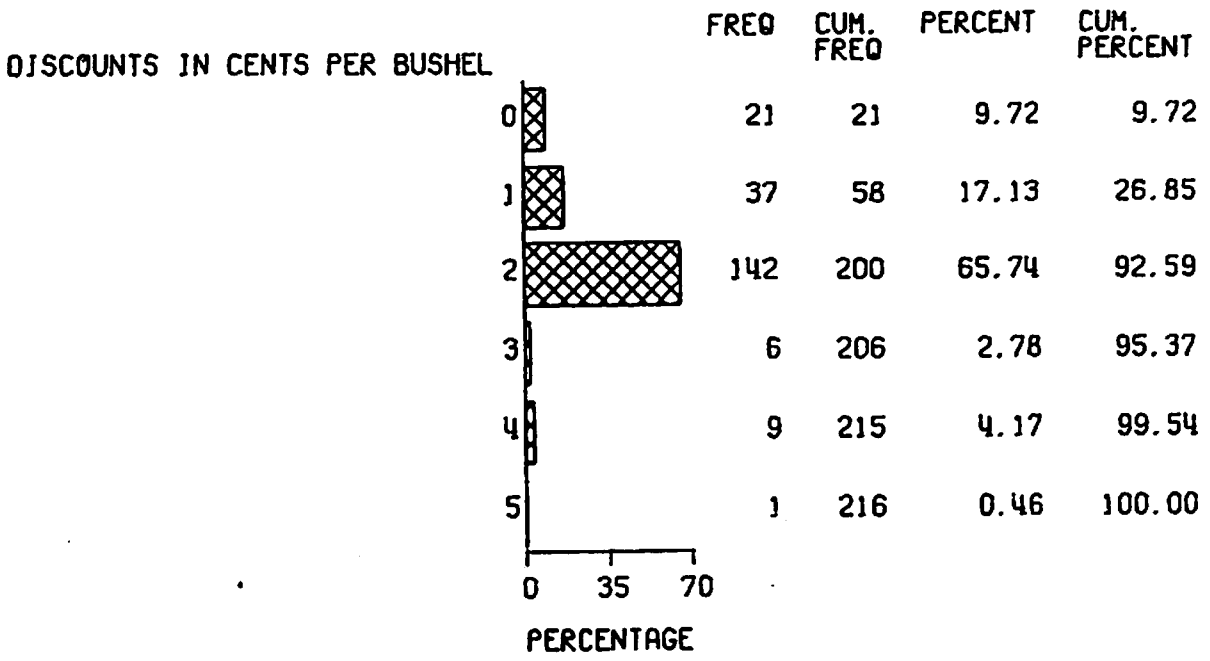


Figure 10. Frequency of Test Weight Discounts for 57 lb. HRS Wheat Among Selected Country Elevators in North Dakota

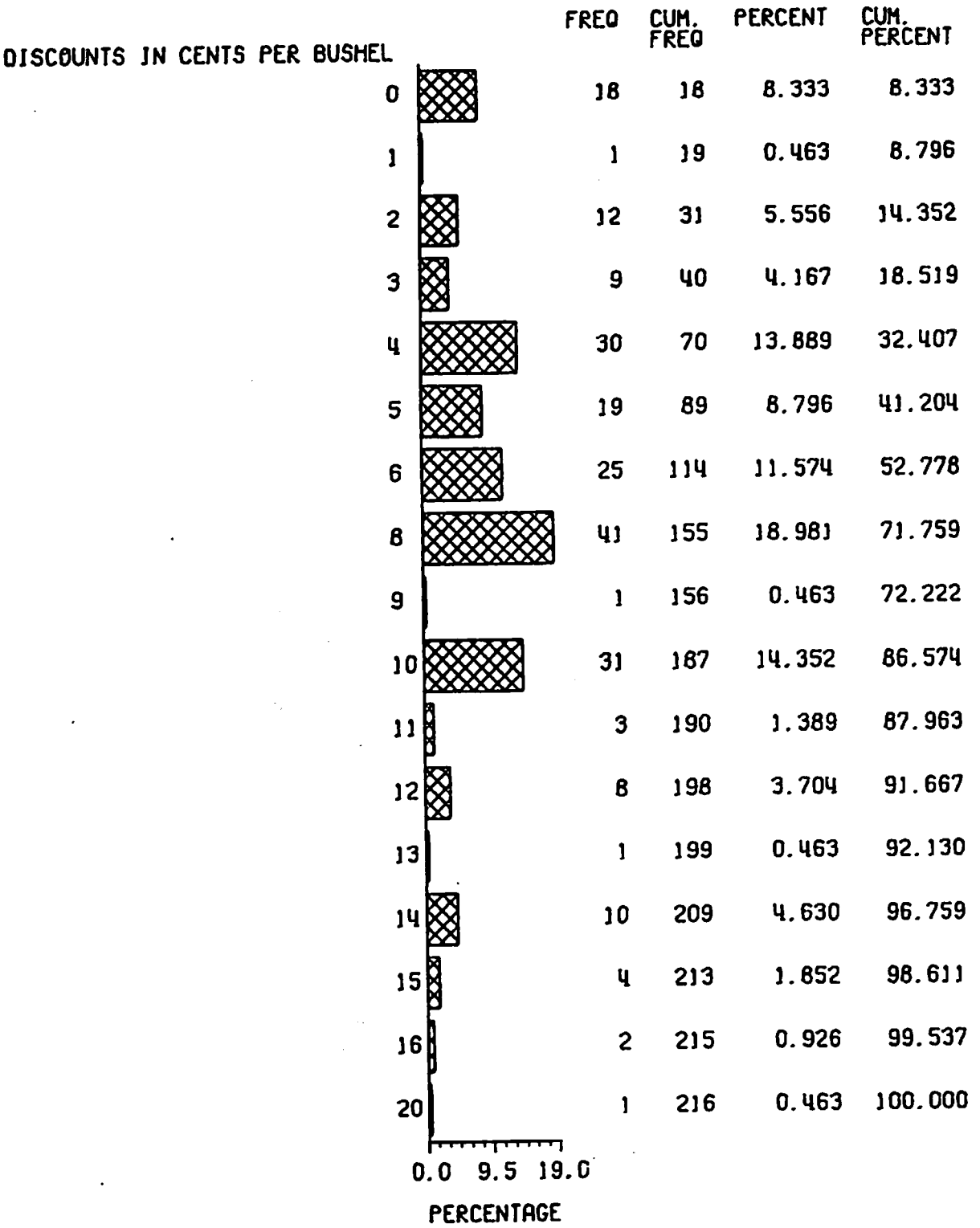


Figure 11. Frequency of Moisture Discounts for 14.5 Percent Moisture HRS Wheat Among Selected Country Elevators in North Dakota

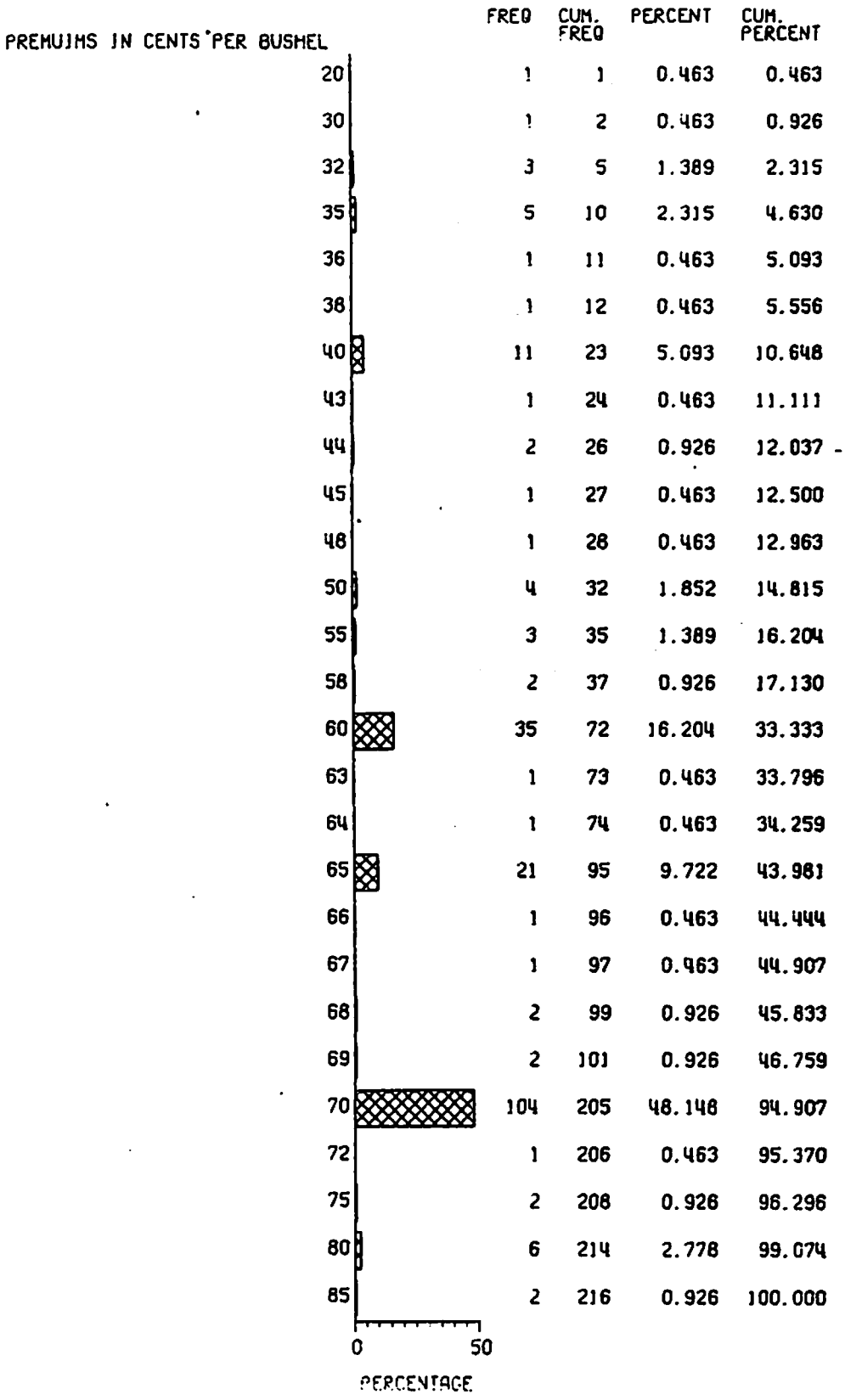
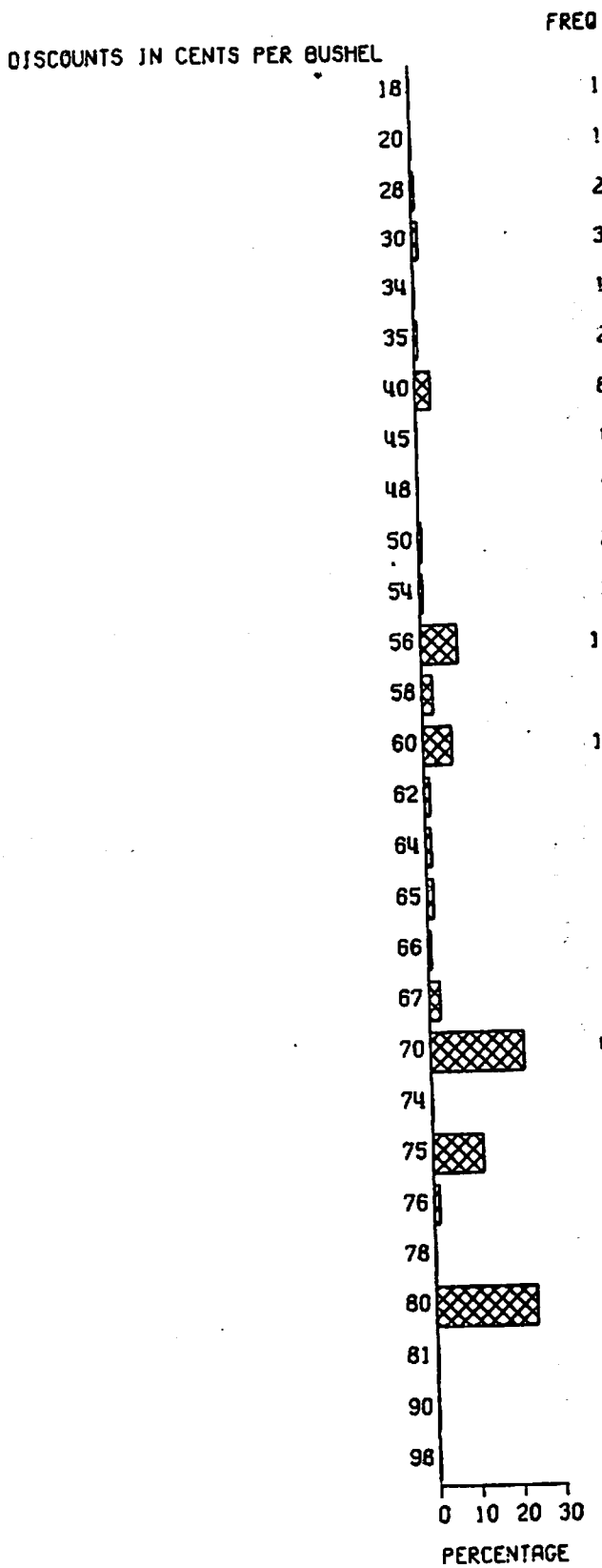
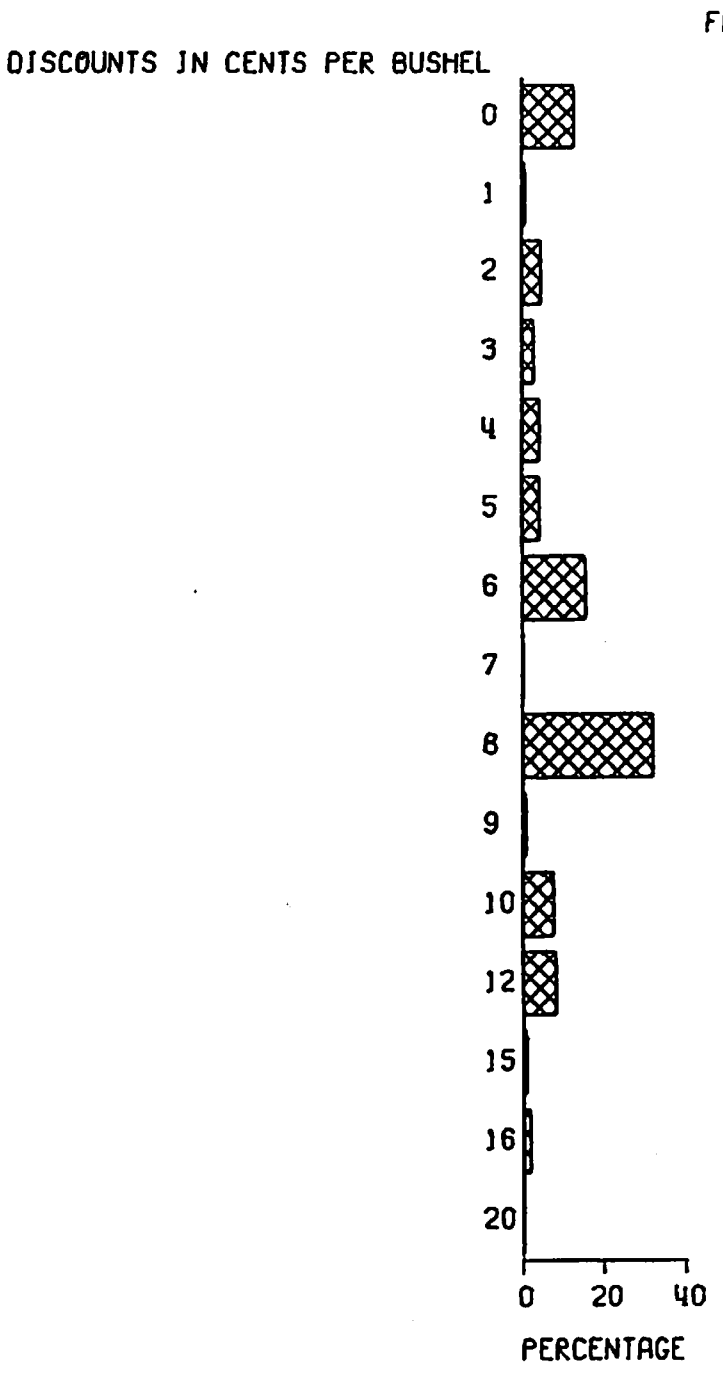


Figure 12. Frequency of Protein Premiums for 16 Percent Protein HRS Wheat Among Selected Country Elevators in North Dakota



DISCOUNTS IN CENTS PER BUSHEL	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
18	1	1	0.463	0.463
20	1	2	0.463	0.926
28	2	4	0.926	1.852
30	3	7	1.389	3.241
34	1	8	0.463	3.704
35	2	10	0.926	4.630
40	8	18	3.704	8.333
45	1	19	0.463	8.796
48	1	20	0.463	9.259
50	2	22	0.926	10.185
54	2	24	0.926	11.111
56	19	43	8.796	19.907
58	6	49	2.778	22.685
60	15	64	6.944	29.630
62	3	67	1.389	31.019
64	3	70	1.389	32.407
65	4	74	1.852	34.259
66	2	76	0.926	35.185
67	6	82	2.778	37.963
70	48	130	22.222	60.185
74	1	131	0.463	60.648
75	26	157	12.037	72.685
76	3	160	1.389	74.074
78	1	161	0.463	74.537
80	52	213	24.074	98.611
81	1	214	0.463	99.074
90	1	215	0.463	99.537
98	1	216	0.463	100.000

Figure 13. Frequency of Protein Discounts for 12 Percent HRS Wheat Among Selected Country Elevators in North Dakota



DISCOUNTS IN CENTS PER BUSHEL	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
0	28	28	12.963	12.96
1	2	30	0.926	13.89
2	11	41	5.093	18.98
3	7	48	3.241	22.22
4	10	58	4.630	26.85
5	10	68	4.630	31.48
6	34	102	15.741	47.22
7	1	103	0.463	47.69
8	69	172	31.944	79.63
9	2	174	0.926	80.56
10	17	191	7.870	88.43
12	18	209	8.333	96.76
15	2	211	0.926	97.69
16	4	215	1.852	99.54
20	1	216	0.463	100.00

Figure 14. Frequency of Damage Discounts for 4 Percent Total Damage HRS Wheat Among Selected Country Elevators in North Dakota

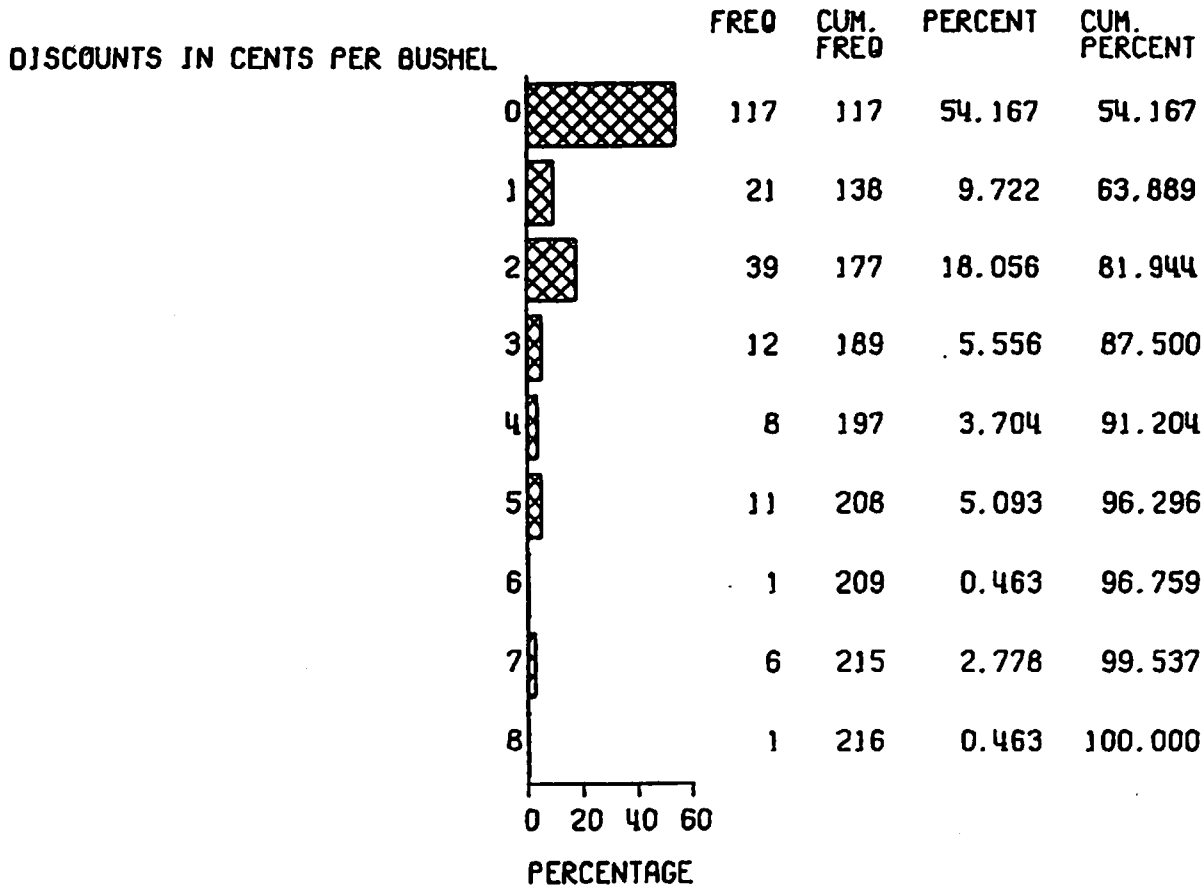


Figure 15. Frequency of Discounts for 1 Percent Foreign Material HRS Wheat Among Selected Country Elevators in North Dakota

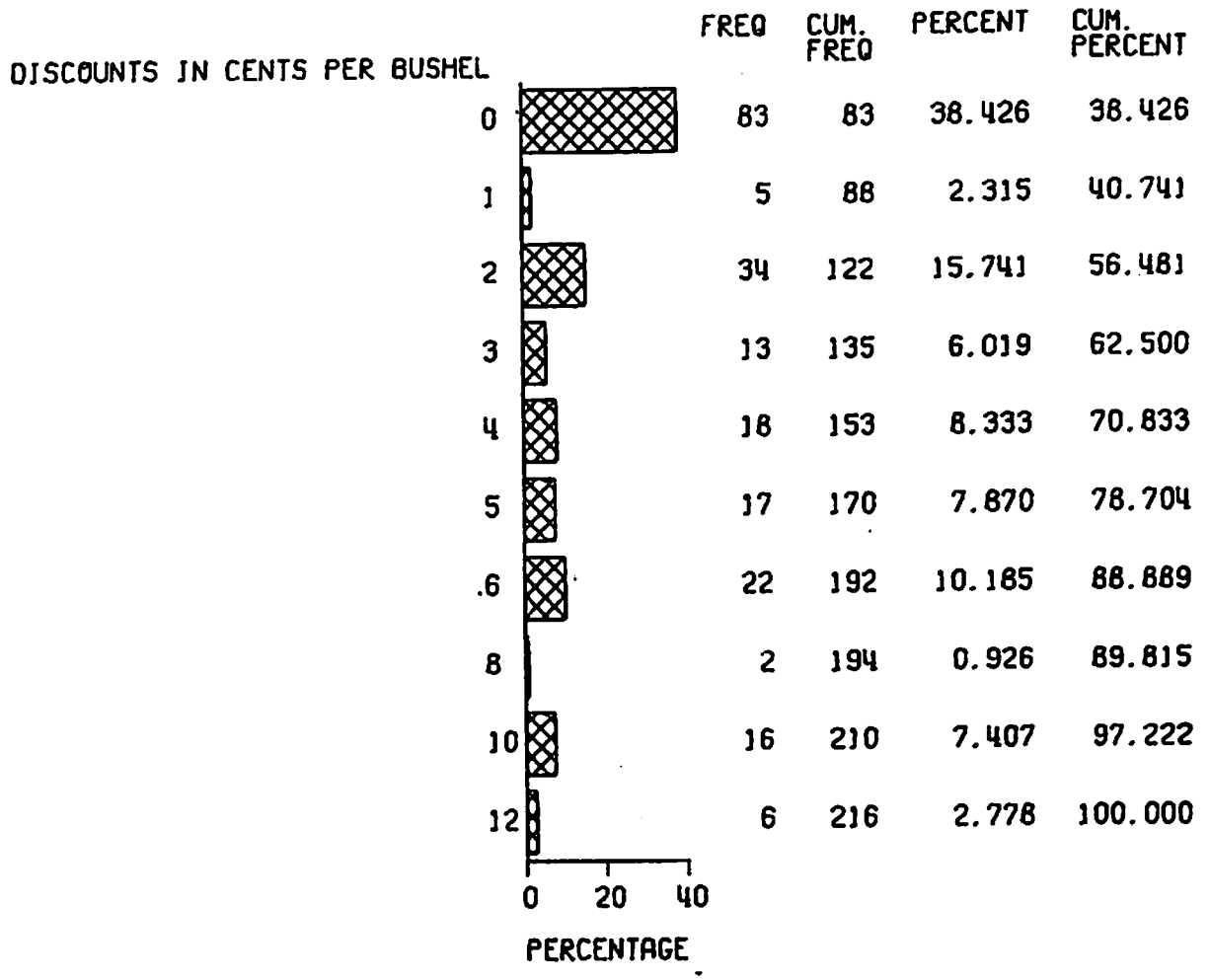
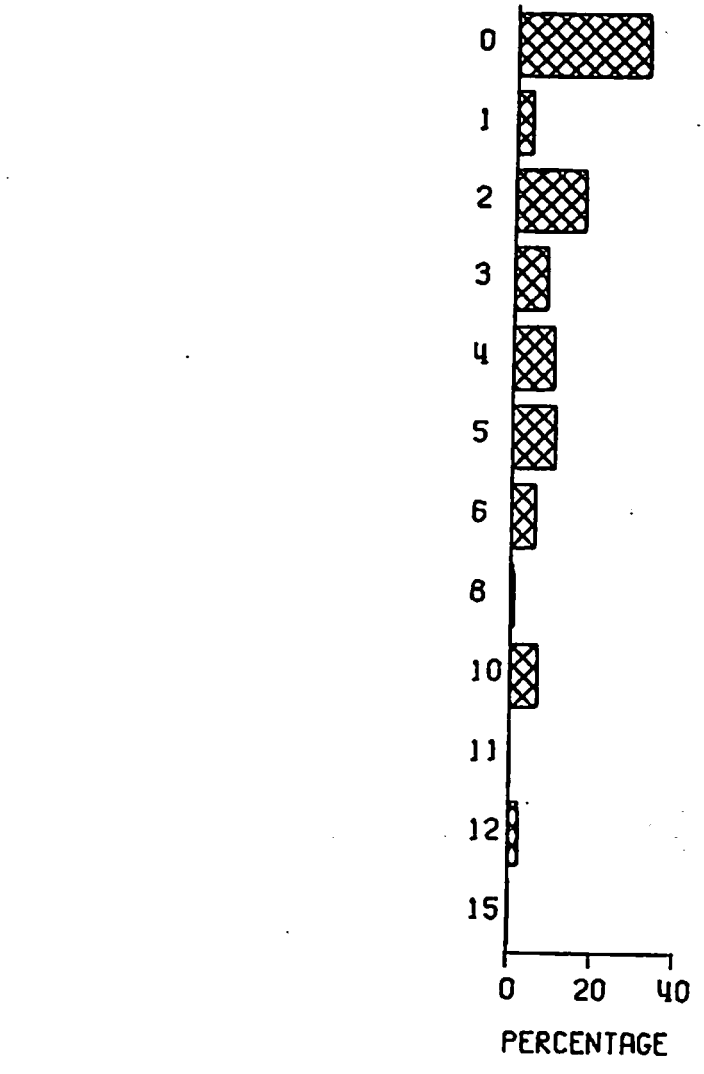


Figure 16. Frequency of Discounts for 5 Percent Shrunken and Broken HRS Wheat Among Selected Country Elevators in North Dakota



DISCOUNTS IN CENTS PER BUSHEL	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
0	69	69	31.944	31.944
1	9	78	4.167	36.111
2	37	115	17.130	53.241
3	18	133	8.333	61.574
4	22	155	10.185	71.759
5	23	178	10.648	82.407
6	13	191	6.019	88.426
8	2	193	0.926	89.352
10	15	208	6.944	96.296
11	1	209	0.463	96.759
12	6	215	2.778	99.537
15	1	216	0.463	100.000

Figure 17. Frequency of Discounts for 2 Percent Contrasting Classes HRS Wheat Among Selected Country Elevators in North Dakota

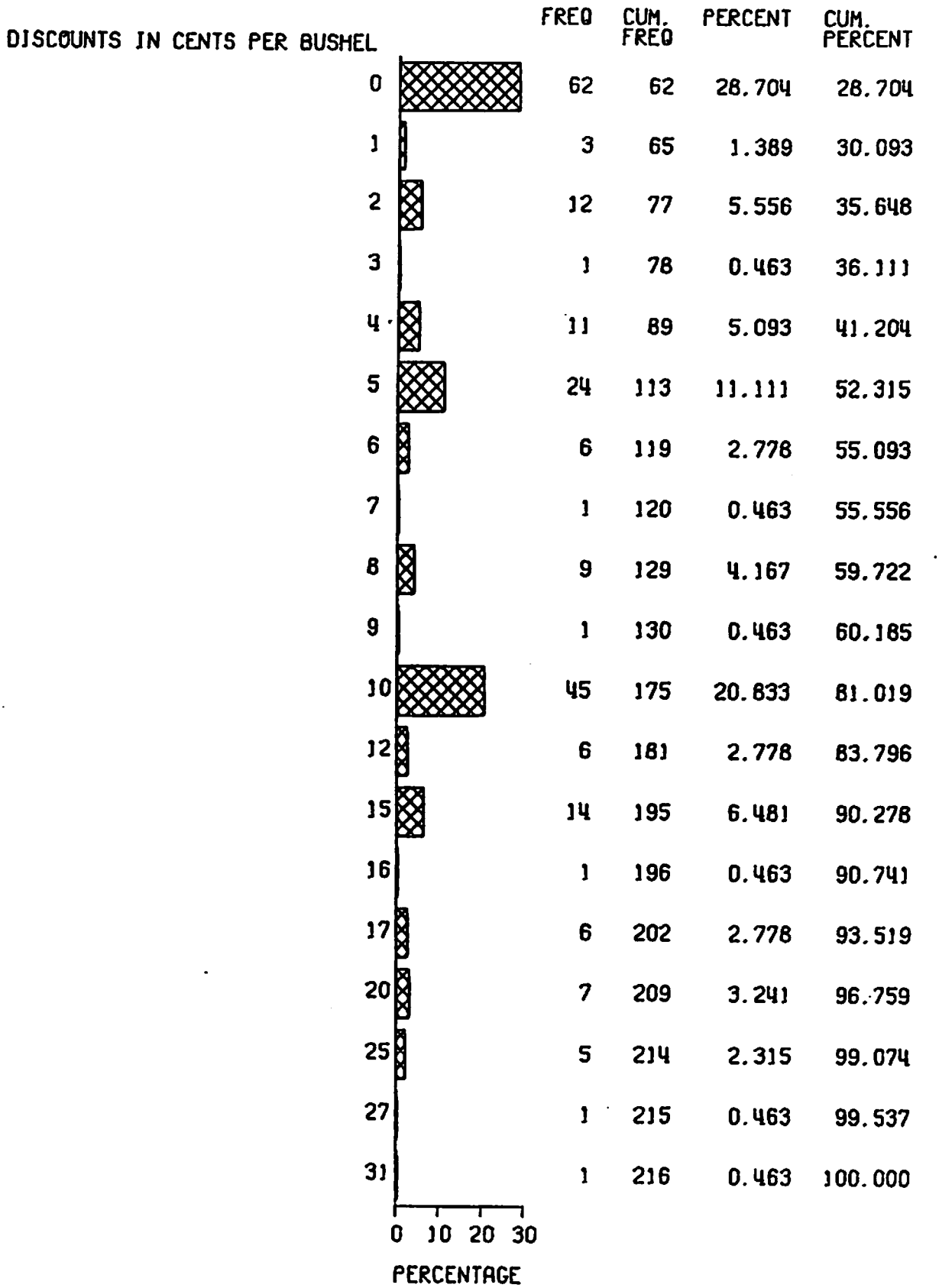


Figure 18. Frequency of Discounts for 5 Percent Wheat of Other Classes HRS Wheat Among Selected Country Elevators in North Dakota

Appendix B

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

Region	Number of Elevators Receiving Questionnaires	Number of Elevators Responding	Percentage Responding
			-Percent-
1 (Northwest)	67	25	37
2 (North Central)	49	27	55
3 (Northeast)	109	47	43
4 (Southwest)	92	39	42
5 (Central)	52	22	42
6 (East Central)	85	34	40
7 (Southeast)	74	24	32
Total	528	218	41

SOURCE: Question 2.

TABLE 2. ORGANIZATIONAL STRUCTURE OF RESPONDING ELEVATORS

Types	Number	Percentage
		-Percent-
Locally owned cooperatives	147	68
Harvest states line elevators	7	3
Locally owned private elecators	42	19
Line elevator of large private company	22	10
Total	218	100

SOURCE: Question 3.

TABLE 3. LOAD-OUT CAPACITY OF RESPONDING ELEVATORS

Load-Out Capacity	Number	Percentage
		-Percent-
6 or less cars/day	51	23
7 to 26 cars/day	132	61
27 to 54 cars/day	27	12
More than 54 cars/day	8	4
Total	218	100

SOURCE: Question 4.

TABLE 4. DISTANCE TO NEAREST COMPETITION OF RESPONDING ELEVATORS

Distance to Competition	Number	Percentage
		-Percent-
Less than 1 mile	54	25
1 to 5 miles	27	12
6 to 10 miles	92	42
More than 10 miles	45	21
Total	218	100

SOURCE: Question 5.

TABLE 5. STORAGE CAPACITY OF RESPONDING ELEVATORS

Storage Capacity	Number	Percentage
		-Percent-
Less than 100,000 bushels	17	8
100,000 to 199,000 bushels	46	21
200,000 to 299,000 bushels	50	23
300,000 to 399,000 bushels	32	15
400,000 to 1,000,000 bushels	59	27
Over 1,000,000 bushels	14	6
Total	218	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, 1985

Region	Average Durum Price	Average HRS Wheat Price
1 (Northwest)	$2.93	$3.28
2 (North Central)	2.97	3.34
3 (Northeast)	3.11	3.48
4 (Southwest)	3.07	3.30
5 (Central)	3.09	3.40
6 (East Central)	3.18	3.55
7 (Southeast)	3.33	3.52
State	3.09	3.42

SOURCE: Question 15 and 18.

TABLE 7. USEAGE OF COMMISSION COMPANIES AND TRACK BUYERS BY RESPONDING ELEVATORS FOR DURUM AND HRS WHEAT (FALL 1985)

Company	Durum	HRS Wheat
	------Percent------	
Harvest states	37.7	34.1
Atwood-Larson	15.7	15.1
Benson-Quinn	14.0	12.3
Kellogg	9.8	8.2
Cargill	6.5	9.3
Peavey	4.0	6.8
Continental	3.0	3.0
Archer-Daniels-Midland	2.8	0.8
International Multifoods	2.3	3.5
Pillsbury	0.8	1.3
Others	3.4	5.6
Total	100.0	100.0

SOURCE: Question 7.

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

TABLE 8. AVERAGE, HIGH, AND LOW PRICE ADJUSTMENTS FOR EACH FACTOR AMONG RESPONDING NORTH DAKOTA COUNTRY ELEVATORS (FALLS OF 1985 & 1984)

Commodity (Base Grade)	Factor	1985				1984			
		Number of Responses	Average	High	Low	Number of Responses	Average	High	Low
			¢/bu.	¢/bu.	¢/bu.		¢/bu.	¢/bu.	¢/bu.
Durum (#1 HAD)	58 lbs. test weight	189	- 2.2	- 8	0	74	- 2.2	- 5	0
	14.5% moisture	189	- 7.6	-25	0	74	- 6.0	-10	0
	Amber durum	189	-16.7	-50	0	74	- 5.7	-15	- 5
	4% damaged kernels	189	- 6.9	-35	0	74	- 6.0	-15	0
	1% foreign material	189	- 1.9	-12	0	74	- 2.8	- 5	0
	5% shrunken and broken kernels	189	- 3.9	-12	0	74	- 6.6	-10	0
	2% contrasting classes	189	- 4.4	-20	0	74	- 2.0	- 5	0
	5% wheat of other classes	189	- 9.1	-30	0	--	--	--	--
HRS Wheat (#1 DNS 14% protein)	57 lbs. test weight	216	- 1.8	- 5	0	77	- 1.9	- 4	- 1
	14.5% moisture	216	- 6.8	-20	0	77	- 5.9	-10	- 2
	16% protein	216	63.4	85	20	77	41.0	68	8
	12% protein	216	-67.4	-98	-18	77	-38.0	-68	-13
	4% damaged kernels	216	- 6.6	-20	0	77	- 2.0	- 5	0
	1% foreign material	216	- 1.3	- 8	0	77	- 1.4	- 4	0
	5% shrunken and broken kernels	216	- 3.0	-12	0	77	- 2.2	- 8	0
	2% contrasting classes	216	- 3.2	-15	0	77	- 1.6	-10	0
	5% wheat of other classes	216	- 7.0	-31	0	--	--	--	--

SOURCE: Questions 16 and 19, and 1984 study.

TABLE 9. QUALITY OF 1984 AND 1985 DURUM AND HRS WHEAT CROPS

Commodity (Base Grade)	Factor	1984 Average Value	1985 Average Value
Durum (#1 HAD)	Test weight	61.3 lbs.	60.7 lbs.
	Moisture	11.5%	12.9%
	Color	Hard Amber Durum	Amber Durum
	Shrunken & Broken Kernels	1.3%	0.6%
	Foreign Material	0.1%	0.1%
	Damaged Kernels	0.3%	0.3%
	Contrasting Classes	0.3%	0.7%
HRS Wheat (#1 DNS 14% protein)	Test weight	60.1 lbs.	59.2 lbs.
	Moisture	10.7%	12.9%
	Color	14.7%	14.0%
	Shrunken & Broken Kernels	2.3%	1.3%
	Foreign Material	0.0%	0.2%
	Damaged Kernels	0.0%	0.2%
	Contrasting Classes	0.0%	0.0%

SOURCE: 1985 Durum wheat and HRS wheat quality reports, Department of Cereal Technology, North Dakota State University, Fargo.

TABLE 10. PRICE ADJUSTMENT AVERAGES FOR DURUM AND HRS WHEAT AMONG ELEVATORS OF SPECIFIED REGIONS IN NORTH DAKOTA (FALL 1985)

Commodity (Base Grade)	Factor	Region 1	Region 2	Region 3	Region 4	Region 5	Region 6	Region 7
		¢/bushel						
Durum (#1 HAD)	58 lbs. Test weight	- 2.3	- 2.2	- 2.1	- 2.2	- 2.6	- 2.0	- 1.9
	14.5% moisture	- 8.1	- 9.0	- 6.8	- 6.5	- 7.2	- 7.5	- 9.1
	Amber durum	-16.0	-16.9	-16.2	-17.0	-15.6	-17.6	-17.7
	4% damaged kernels*	- 6.7	- 5.4	- 6.9	- 7.1	- 7.0	- 9.0	- 5.7
	1% foreign material	- 1.7	- 1.9	- 2.0	- 1.7	- 2.3	- 2.4	- 1.6
	5% shrunken and broken kernels	- 3.4	- 4.6	- 4.7	- 3.1	- 3.9	- 4.2	- 2.7
	2% contrasting classes	4.6	- 4.8	- 4.6	- 4.2	- 4.1	- 4.5	- 4.2
	5% wheat of other classes*	-10.1	- 8.4	- 6.6	- 9.5	- 9.0	-10.6	-11.7
HRS Wheat (#1 DNS 14% protein)	57 lb. test weight	- 2.2	- 1.7	- 1.8	- 1.6	- 1.8	- 1.6	- 1.7
	14.5% moisture*	- 7.2	- 8.7	- 6.6	- 5.6	- 7.3	- 6.3	- 7.1
	16% protein**	48.8	61.4	67.6	61.3	64.9	68.6	68.1
	12% protein**	-60.5	-67.0	-72.3	-60.1	-69.1	-72.5	-68.6
	4% damaged kernels	- 7.6	- 5.8	- 6.7	- 5.8	- 6.7	- 7.6	- 5.7
	1% foreign material	- 1.9	- 1.8	- 1.0	- 0.9	- 1.4	- 1.3	- 1.1
	5% shrunken and broken kernels**	4.2	- 4.7	- 2.7	- 2.2	- 2.6	- 2.4	- 1.9
	2% contrasting classes**	- 5.1	- 4.6	- 3.3	- 2.1	- 2.8	- 2.6	- 2.5
	5% wheat of other classes**	-11.2	- 9.1	- 5.0	- 6.0	- 7.0	- 7.3	- 5.0

*Significant differences were found between the highest and lowest average price adjustment.
**More than two price adjustment averages were found significantly different.
SOURCE: Questions 2, 16, and 19.

TABLE 11. SIGNIFICANT DIFFERENCES BETWEEN REGIONAL AVERAGE PREMIUMS FOR HRS WHEAT WITH 16 PERCENT PROTEIN (FALL 1985)

Region	Average Premium for HRS Wheat with 16 Percent Protein	Grouping*
	¢/bushel	
6 (East Central)	68.6	A
7 (Southeast)	68.1	A
3 (Northeast)	67.6	A
5 (Central)	64.9	A B
2 (North Central)	61.4	B
4 (Southwest)	60.4	B
1 (Northwest)	48.8	C

*Regional averages with the same letter are not significantly different.

SOURCE: Questions 2 and 19.

TABLE 12. SIGNIFICANT DIFFERENCES BETWEEN REGIONAL AVERAGE DISCOUNTS FOR HRS WHEAT WITH 12 PERCENT PROTEIN (FALL 1985)

Region	Average Discount for HRS Wheat with 12 Percent Protein	Grouping*
	- - - - - -¢/bushel- - - - - -	
6 (East Central)	-72.5	A
3 (Northeast)	-72.3	A
5 (Central)	-69.1	A
7 (Southeast)	-68.6	A
2 (North Central)	-67.0	A
1 (Northwest)	-60.5	B
4 (Southwest)	-59.6	B

*Regional averages with the same letter are not significantly different.

SOURCE: Questions 2 and 19.

TABLE 13. SIGNIFICANT DIFFERENCES BETWEEN REGIONAL AVERAGE DISCOUNTS FOR HRS WHEAT WITH PERCENT SHRUNKEN AND BROKEN KERNELS (FALL 1985)

Region	Average Discounts for HRS Wheat with 5 Percent Shrunken and Broken Kernels	Grouping*
	¢/bushel	
2 (North Central)	-4.7	A
1 (Northwest)	-4.2	A B
6 (East Central)	-2.8	A B C
3 (Northeast)	-2.7	B C
5 (Central)	-2.7	B C
4 (Southwest)	-2.2	C
7 (Southeast)	-1.9	C

*Regional averages means with the same letter are not significantly different.

SOURCE: Question 2 and 19.

TABLE 14. SIGNIFICANT DIFFERENCEs BETWEEN REGIONAL AVERAGE DISCOUNTS FOR HRS WHEAT WITH 2 PERCENT CONTRASTING CLASSES

Region	Average Discounts for HRS Wheat with 2 Percent Contrasting Classes	Grouping*
	¢/bushel	
1 (Northwest)	5.1	A
2 (North Central)	4.6	A B
3 (Northeast)	3.3	B C
5 (Central)	2.8	C
6 (East Central)	2.6	C
7 (Southeast)	2.5	C
4 (Southwest)	2.0	C

*Regional averages means with the same letter are not significantly different.

SOURCE: Questions 2 and 19.

TABLE 15. SIGNIFICANT DIFFERENCES BETWEEN REGIONAL AVERAGE DISCOUNTS FOR HRS WHEAT WITH 5 PERCENT WHEAT OF OTHER CLASSES (FALL 1985)

Region	Average Discount for HRS Wheat with 5 Percent Wheat of Other Classes	Grouping*
	¢/bushel	
1 (Northwest)	-11.2	A
2 (North Central)	- 9.1	A B
6 (East Central)	- 7.3	B C
5 (Central)	- 7.0	B C
4 (Southwest)	- 6.1	B C
3 (Northeast)	- 5.0	C
7 (Southeast)	- 5.0	C

*Regional averages with the same letter are not significantly different.

SOURCE: Questions 2 and 19.

TABLE 16. PRICE ADJUSTMENT AVERAGES FOR DURUM AND HRS WHEAT AMONG SELECTED TYPES OF ELEVATOR STRUCTURE ORGANIZATIONS (FALL 1985)

Commodity (Base Grade)	Factor	Cooperative*	Private
		- - - - -¢/bushel- - - - -	
Durum (#1 HAD)	58 lb. test weight	- 2.1	- 2.4
	14.5% moisture**	- 8.1	- 6.5
	Amber durum	-16.3	-17.7
	4% damaged kernels	- 6.9	- 6.7
	1% foreign material	- 1.9	- 2.0
	5% shrunken and broken kernels	- 3.9	- 3.8
	2% Contrasting classes**	- 4.9	- 3.8
	5% Wheat of other classes	- 9.7	- 7.7
HRS Wheat (#1 DNS 14% protein)	57 lb. test weight	- 1.8	- 1.8
	14.5% moisture	- 7.0	- 6.1
	16% protein	63.4	63.4
	12% protein	-67.5	-67.0
	4% damaged kernels	- 6.7	- 6.3
	1% foreign material	- 1.2	- 1.4
	5% shrunken and broken kernels	- 3.2	- 2.6
	2% contrasting classes**	- 3.6	- 2.1
	5% wheat of other classes	- 7.4	- 5.8

*Includes Harvest States line elevators.
**Averages are significantly different.

SOURCE: Questions 3, 16, and 19.

TABLE 17. PRICE ADJUSTMENT AVERAGES FOR DURUM AND HRS WHEAT AMONG ELEVATORS WITH SELECTED LOADOUT CAPACITIES (FALL 1985)

Commodity (Base Grade)	Factor	Six Cars or Less	7 to 26 Cars	More Than 26 Cars
		¢/bushel		
Durum (#1 HAD)	58 lb. test weight	- 2.3	- 2.3	- 1.7
	14.5% moisture	- 7.4	- 7.4	- 8.5
	Amber durum	-17.3	-16.3	-17.0
	4% damaged kernels	- 5.7	- 7.3	- 7.1
	1% foreign material	- 2.3	- 1.7	- 2.1
	5% shrunken and broken kernels	- 4.3	- 4.0	- 3.0
	2% contrasting classes	- 4.5	- 4.3	- 5.0
	5% wheat of other classes	- 9.3	- 8.7	-10.5
HRS Wheat (#1 DNS 14% protein)	57 lb. test weight	- 1.8	- 1.8	- 1.7
	14.5% moisture	- 6.9	- 6.6	- 7.2
	16% protein*	60.1	64.5	64.0
	12% protein	-62.9	-69.4	-66.5
	4% damaged kernels	- 6.4	- 6.7	- 6.2
	1% foreign material*	- 1.9	- 1.1	- 1.3
	5% shrunken and broken kernels*	- 4.2	- 2.7	- 2.3
	2% contrasting classes	- 3.6	- 2.9	- 3.4
	5% wheat of other classes	- 8.1	- 6.5	- 7.0

*High and low price adjustment averages are significantly different.

SOURCE: Questions 4, 16, and 19.

TABLE 18. PRICE ADJUSTMENT AVERAGES FOR DURUM AND HRS WHEAT AMONG ELEVATORS WITH SELECTED DISTANCES TO NEAREST COMPETITION (FALL 1985)

Commodity (Base Grade)	Factor	Less Than 1 Mile	1 to 5 Miles	6 to 10 Miles	More Than 10 Miles
		- - - - - - - - ¢/bushel - - - - - -			
Durum (#1 HAD)	58 lb. test weight	- 2.1	- 2.1	- 2.2	- 2.2
	14.5% moisture	- 8.1	- 7.3	- 7.4	- 7.4
	Amber durum	-15.6	-18.5	-16.6	-16.8
	4% damaged kernels	- 6.0	- 8.1	- 7.1	- 6.8
	1% foreign material	- 1.9	- 2.0	- 2.1	- 1.7
	8% shrunken and broken kernels	- 3.4	- 4.3	- 4.2	- 3.6
	1% contrasting classes	- 3.8	- 4.3	- 4.9	- 4.4
	5% wheat of other classes	- 8.9	- 8.7	- 8.9	-10.0
HRS Wheat (#1 DNS 14% protein)	57 lb. test weight	- 1.8	- 1.7	- 1.7	- 1.8
	14.5% moisture	- 6.6	- 7.3	- 6.8	- 6.5
	16% protein	63.7	64.0	64.3	61.0
	12% protein	-65.4	-68.3	-68.4	-67.1
	4% damaged kernels	- 6.0	- 7.0	- 7.2	- 5.7
	1% foreign material	- 1.3	- 1.5	- 1.4	- 1.0
	5% shrunken and broken kernels	- 2.5	- 2.6	- 3.5	- 2.9
	2% contrasting classes	- 2.7	- 2.9	- 3.5	- 3.1
	5% wheat of other classes	- 6.1	- 6.4	- 7.1	- 8.0

SOURCE: Questions 5, 16, and 19.

TABLE 19. PRICE ADJUSTMENT AVERAGES FOR DURUM AND HRS WHEAT AMONG ELEVATORS WITH SELECTED STORAGE CAPACITIES (FALL 1985)

Commodity (Base Grade)	Factor	300,000 Bushels or Less Storage Capacity	Over 300,000 Bushels Storage Capacity
		¢/bushel	
Durum (#1 HAD)	58 lb. test weight	- 2.3	- 2.1
	14.5% moisture	- 7.6	- 7.5
	Amber durum	-16.7	-16.6
	4% damaged kernels	- 6.5	- 7.3
	1% foreign material	- 1.9	- 2.0
	5% shrunken and broken kernels	- 4.0	- 3.7
	7% contrasting classes	- 4.4	- 4.5
	5% wheat of other classes	- 8.2	-10.2
HRS Wheat (#1 DNS 14% protein)	57 lb. test weight	- 1.8	- 1.7
	14.5% moisture	- 7.2	- 6.4
	16% protein	62.3	64.8
	12% protein	-67.4	-67.6
	4% damaged kernels	- 6.7	- 6.4
	1% foreign material	- 1.4	- 1.1
	5% shrunken and broken kernels	- 3.4	- 2.5
	2% contrasting classes	- 3.4	- 2.9
	5% wheat of other classes	- 7.1	- 6.8

SOURCE: Questions 6, 16, and 19.

TABLE 20. PRICE ADJUSTMENT AVERAGES FOR DURUM AND HRS WHEAT AMONG EASTERN AND WESTERN NORTH DAKOTA ELEVATORS WITH HIGH AND LOW BOARD PRICES (FALL 1985)

Commodity	Location	Factor	Low Price	High Price
			- - - -¢/bushel- - - -	
Durum	East	58 lb. test weight	- 2.1	- 2.1
		14.5% moisture	- 8.5	- 7.6
		Amber durum	-15.6	-17.5
		4% damaged kernels	- 6.2	- 7.1
		1% foreign material	- 1.9	- 2.0
		5% shrunken and broken kernels	- 3.5	- 4.5
		2% contrasting classes	- 4.5	- 4.6
		5% wheat of other classes	- 8.6	- 8.9
	West	58 lb. test weight	- 2.1	- 2.6
		14.5% moisture*	- 8.2	- 5.8
		Amber durum	-16.5	-16.1
		4% damaged kernels	- 7.2	- 6.7
		1% foreign material	- 2.2	- 1.4
		5% shrunken and broken kernels	- 3.6	- 3.2
		2% contrasting classes	- 4.6	- 3.9
		5% wheat of other classes	- 9.4	- 9.8
HRS Wheat	East	57 lb. test weight	- 1.8	- 1.7
		14.5% moisture*	- 8.2	- 6.5
		16% protein*	64.0	68.0
		12% protein*	-67.9	-72.0
		4% damaged kernels	- 5.9	- 6.9
		1% foreign material	- 1.9	- 1.0
		5% shrunken and broken kernels*	- 4.2	- 2.5
		2% contrasting classes*	- 4.5	- 2.6
		5% wheat of other classes	- 7.8	- 5.8
	West	57 lb. test weight	- 1.9	- 1.7
		14.5% moisture	- 6.2	- 6.6
		16% protein	57.1	63.5
		12% protein	-62.2	-65.9
		4% damaged kernels	- 6.3	- 7.2
		1% foreign material	- 1.3	- 1.3
		5% shrunken and broken kernels	- 2.8	- 3.2
		2% contrasting classes	- 3.2	- 2.5
		5% wheat of other classes	- 7.2	- 8.2

*Averages are significantly different.

SOURCE: Questions 15, 16, 18, and 19.

TABLE 21. AVERAGE, HIGH, AND LOW CLEANING COSTS AND WHEAT SCREENINGS PRICES FOR 1984 AND 1985

Item	1984			1985		
	Average	High	Low	Average	High	Low
Cleaning Costs	3.5¢/bu.	9¢/bu.	0¢/bu.	4.2¢/bu.	22¢/bu.	0¢/bu.
Wheat Screenings Prices	$42.67/ton	$55.00/ton	$25.00/ton	$33.19/ton	$55.00/ton	$0/ton

TABLE 22. ECONOMICS OF CLEANING WHEAT WITH VARIOUS SPECIFIED CLEANING COSTS, SCREENING PRICES, AND DOCKAGE PERCENTAGES

Incoming Dockage Percent	6.0¢/Bushel Cleaning Cost		4.0¢/Bushel Cleaning Cost		2.0¢/Bushel Cleaning Cost	
	Screening $40/Ton	Screening $20/Ton	Screening $40/Ton	Screening $20/Ton	Screening $40/Ton	Screening $20/Ton
	- - - - Net Savings on a 50,000 lb. Transaction for Cleaning - - - -					
5	$25.00	$ 0.00	$41.67	$16.67	$58.33	$33.33
4	10.00	- 10.00	26.67	6.67	43.33	23.33
3	- 5.00	- 20.00	11.67	- 3.33	28.33	13.33
2	- 20.00	- 30.00	- 3.33	- 13.33	13.33	3.33
1	- 35.00	- 40.00	- 18.33	- 23.33	- 1.67	- 6.67

Notes: assume transportation cost = 1¢/lb.
net profit from cleaning = (W) (D) (S + T) - (W)(C)
where: W = total weight of unclean grain in lbs.
D = percent dockage in wheat
S = price of wheat screening per lb.
T = cost of transportation per lb.
C = cost of cleaning per lb.
assume wheat is cleaned down to 0.0 percent dockage level

Appendix C

GRAIN MARKETING QUESTIONNAIRE
(Fall 1985)

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 1 mile
   _____(b) 1 to 5 miles
   _____(c) 6 to 10 miles
   _____(d) More than 10 miles

6. What is the total 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. Do you clean grain for shipment? _____ Yes _____ No

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 to?
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 on November 1, 1985?
_____

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.	Other_____	_____¢/Bu.

17. How have these discounts changed since harvest?

18. What was your board price for #1 DNS 14% protein on November 1, 1985?
_____

19. 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 "as is" moisture)
d.	12% Protein	_____¢/Bu.	(tested "as is" moisture)
e.	4% Total Damaged Kernels	_____¢/Bu.	
f.	1% Foreign Material	_____¢/Bu.	
g.	5% Shrunken & Broken Kernels	_____¢/Bu.	
h.	2% Contrasting Classes	_____¢/Bu.	
i.	5% Wheat of Other Classes	_____¢/Bu.	
j.	Other_____	_____¢/Bu.	

20. How have these discounts changed since harvest?

21. Comments:

jlp:85