Agricultural Economics Miscellaneous Report No. 163 July 1992

Pricing and Marketing Practices For North Dakota Durum and HRS Wheat: 1991 Crop Year

Daniel J. Scherping
William W. Wilson

Department of Agricultural Economics
North Dakota State University
Fargo, North Dakota 58105

Table of Contents

List of Figures

List of Appendix Tables

List of Appendix Tables (Continued)

List of Appendix Figures

List of Appendix Figures (Cont'd)

Highlights

Buyers of grain use premiums and discounts to convey to suppliers the value of quality characteristics. Premiums and discounts are determined by supply and demand for those quality characteristics. This report, the eighth in a series, contains the results of a 1991 survey of pricing and marketing practices used by North Dakota country elevators for durum and hard red spring (HRS) wheat. Results for HRS wheat show that the protein level increased to the highs of 1988 and 1989 and that the premium for 16 percent protein and the discount for 12 percent protein decreased from the previous year. Discounts continued the downward trend of recent years.

PRICING AND MARKETING PRACTICES FOR NORTH DAKOTA DURUM AND HRS WHEAT: 1991 CROP YEAR

Daniel J. Scherping, Richard D. Taylor, and William W. Wilson*

Introduction

Buyers of grain use premiums and discounts to convey to suppliers the value of quality characteristics. Premium and discount schedules are determined among individual market participants, according to buyer's quality needs and the distribution of quality characteristics available to the market. Thus, premiums and discounts frequently change as needs of buyers and the availability of grain that possess those characteristics change. Premiums and discounts also change with time, location, and expectation of future market conditions. Individuals in the grain market system must be aware of the price of grain and the value of premiums and discounts when making business decisions.

Since premiums and discounts are important to individual market participants and since premium and discount schedules are rarely published, the Department of Agricultural Economics began to survey North Dakota country elevators in 1984 about pricing and marketing practices for hard red spring (HRS) and durum wheat. The seven previous surveys, listed in the reference, can be obtained from the Department of Agricultural Economics, North Dakota State University (NDSU).

This report, the eighth in a series, contains the results of a 1991 survey and is compared to previous years. The following sections present general characteristics of participating elevators, premiums and discounts, economics of dockage removal, and a summary and conclusion. Reference is made to tables and figures in Appendixes A and B, respectively. The survey questionnaire is contained in Appendix C. The section pertaining to economics of dockage removal also includes major highlights from a recent NDSU study on this topic. Discussion in this report is kept brief and illuminates only major points since the tables and figures are self-explanatory.

General Characteristics of Participating Elevators

Questionnaires were sent to 509 elevators in North Dakota, and 100 usable surveys were returned, giving a respondent rate of 20 percent (Table A1). The following discussion is based on the responding elevators.

Of the responding elevators, two-thirds were classified as co-op elevators (Harvest States line elevators are included in this category) and one-third as investor-orientated firms (IOF) (Table A2). Single-facility (location) elevators comprised 68 percent of the responding elevators. Multi-facility (location) elevators represent

---

*Research assistant, research specialist, and professor, respectively, Department of Agricultural Economics, North Dakota State University, Fargo.

28 percent of the responding elevators, and 4 percent of the returned surveys did not indicate either category (Table A3).

Load-out capacity indicates the size of the elevator; smaller elevators were more responsive to the 1991 survey than to previous years. Elevators with a load-out capacity of 6 cars per day or less represent 26 percent of the elevators. A majority of the responding elevators had a load-out capacity of 7 to 26 cars per day, representing 53 percent of the elevators (Table A4).

An important competitive factor is the distance to the nearest competitor. Elevators with competition within 5 miles and competition from 6 to 10 miles represented 33 percent and 42 percent of responding elevators, respectively. Elevators with nearest competitor more than 10 miles away represented 25 percent of the elevators (Table A5). These percentages are similar to 1990.

Storage capacity of responding elevators is less than in previous years. Responding elevators are evenly distributed across the storage capacity range, except for the 400,000 to 999,000 bushel range, representing 34 percent of the responding elevators (Table A6).

Harvest States continued to be the largest purchaser of durum and HRS wheat with market shares at 40 percent and 34 percent, respectively. Benson-Quinn lost market shares in both durum and HRS wheat while Cargill gained in both commodities from the previous year (Table A7).

The market share held by IOF and co-ops varied greatly across crop reporting districts (CRD - Figure B1) from the previous year. However, Harvest States generally held the largest market share across CRDs for both classes of wheat (Table A8).

Atwood-Larson and Benson-Quinn lost market shares in both durum and HRS from IOF, while Kellogg and Cargill increased market shares. Harvest States continued to dominate purchases from co-op elevators for both durum and HRS wheat (Table A9).

Market share varied according to elevator storage; Harvest States generally was the largest purchaser. One of the commission firms (Atwood-Larson, Benson-Quinn, or Kellogg) or Peavey held the second largest market share - with three exceptions: Harvest States and the "Other" category held 90 percent and 10 percent, respectively, of the durum market from elevators with a 99,000 bushel or less storage capacity. Cargill was the second largest purchaser of durum and HRS wheat from elevators with a 1 million bushel or more storage capacity (Table A10).

Individual IOFs' and co-ops' market shares, categorized by load-out capacity, also varied greatly from the previous year. Harvest States' market share increased substantially for both durum and HRS wheat for elevators with a load-out capacity of 6 or less cars per day and elevators that could load out more than 54 cars per day (Table A11).

Premiums and Discounts

Premiums and discounts, relative to the base price of the commodity, are an important component of the grain's total price. Elevators located in eastern North Dakota (CRD #3, #6, and #9 - Figure B1) tended to have higher prices for US #1 hard amber durum and US #1 DNS 14% protein (Table A12). Higher prices in eastern North Dakota largely reflect transport rate differentials.

Results from the 1991 durum and HRS wheat crop quality survey are shown in Table A13. Test weight decreased and the percent of shrunken and broken kernels increased from 1990 for both classes of wheat. The average protein level of HRS wheat increased to levels similar to 1988 and 1989 crops. Figure B2 shows that the protein level of hard red winter (HRW) wheat grown in Kansas also increased from 1990. Associated with the increased protein level in both HRS and HRW wheat was a decrease in the protein premium for both wheats (Figure B3).

Figures B4 to B6 show the discounts for selected grade factors over the years for both durum and HRS wheat. Figures B7 to B23 show how premiums and discounts varied in 1991. A spike in the figure indicates the prevalence of a particular premium or discount.

Average premiums and discounts since 1984 are given in Table A14. All discounts for durum in 1991 were equal to or less than discounts since 1987, except for the discount of 14.5% moisture, which increased slightly. The premium for 16 percent HRS decreased substantially from 1990 as had the discount for 12 percent HRS. The premium for 16 percent protein HRS and the discount for 12 percent protein HRS were similar to 1989 levels, which were low compared to other years.

The premium for 16 percent protein HRS wheat was larger in CRD #1, #4, and #7; also, the discount for 12 percent protein HRS wheat was larger in these three CRDs compared to the other CRD. This is just the opposite from 1990 (Table A15).

The difference in the premium and discount schedule, based on the ownership of the elevator (co-op and IOF), load-out capacity, miles to nearest competition, and storage capacity did not appear to differ greatly (Tables A16, A17, A18, and A19). The only noticeable difference is that co-op elevators generally discounted HRS less than did IOF (Table A16).

Economics of Dockage Removal

NDSU, in cooperation with the Economic Research Service (ERS), completed a major study titled "Economics of Alternative Regulations on Wheat Cleaning in Hard Red Spring, Durum, and White Wheat." Four reports pertaining to different aspects of the cleaning decision were produced under this study and are listed in the References. Copies can be obtained from the Department of Agricultural Economics, North Dakota State University.

The first publication, "Wheat Cleaning Costs and Grain Merchandising," reports on why and where wheat is cleaned, the cost of cleaning at various locations, and merchandising practices. The second publication, "Wheat Cleaning Decisions at Country Elevators,"

is an analysis of blending and cleaning at country elevators. The third publication, "Measuring the Impact of Dockage on Foreign Demand for U.S. Wheat," illustrates an integrated export-import model, which can be used to evaluate the impact of dockage on import demand and U.S. export revenue. The fourth publication, "Impacts of Alternative Policies Regulating Dockage," summarizes the three previous reports and analyzes different ways to regulate dockage and the economic impact of those regulations.

Results from the NDSU/ERS study indicated that 89.6% of elevators in the spring wheat production region own and operate cleaners, while only 14.9% of the elevators in the white wheat production region owned and operate grain cleaners (Scherping et al. 1992c). A survey of elevator managers indicated that the cost of cleaning increase as wheat is cleaned to lower dockage levels (Figure 1).

Two important factors that influence the cost of cleaning vary greatly across elevators: the cleaner's utilization rate and the amount of wheat lost during the cleaning process. Economic-engineering cost estimates were derived to show the impact of certain variables on the cost of cleaning, including utilization rate and wheat loss. Grain cleaner ownership involved relatively large fixed costs compared to variable costs; thus, managers who match cleaning capacity with the amount of grain cleaned annually have lower total cleaning costs (Figure 2). The amount of wheat lost during cleaning directly impacts the cost of cleaning (Figure 3). Any wheat removed with the dockage will represent a loss to the elevator, because of the price difference between screenings and wheat.

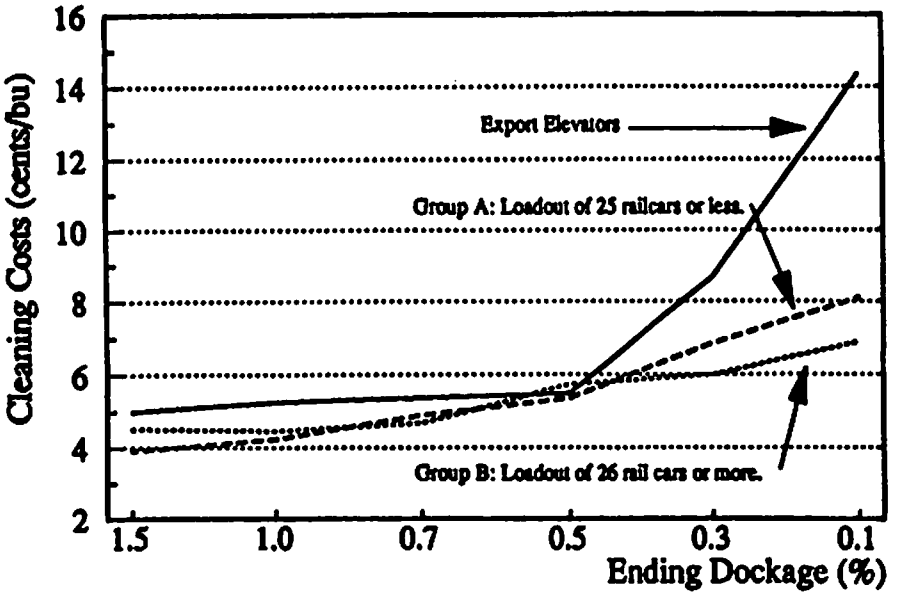


Figure 1. Wheat Cleaning Costs at Export and Country Elevators, 1991 and 1990, Respectively

SOURCE: Scherping et al. (1992c).

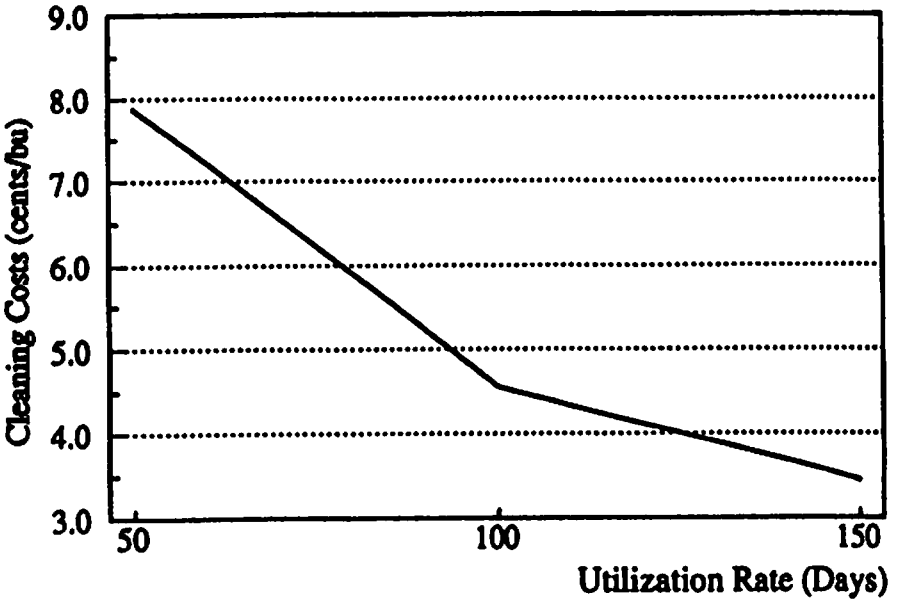


Figure 2. Effects of Equipment Utilization Rate on Cleaning Costs, With Beginning and Ending Dockage Levels of 3% and 0.7%, Respectively, 1991

SOURCE: Scherping et al. (1992c).

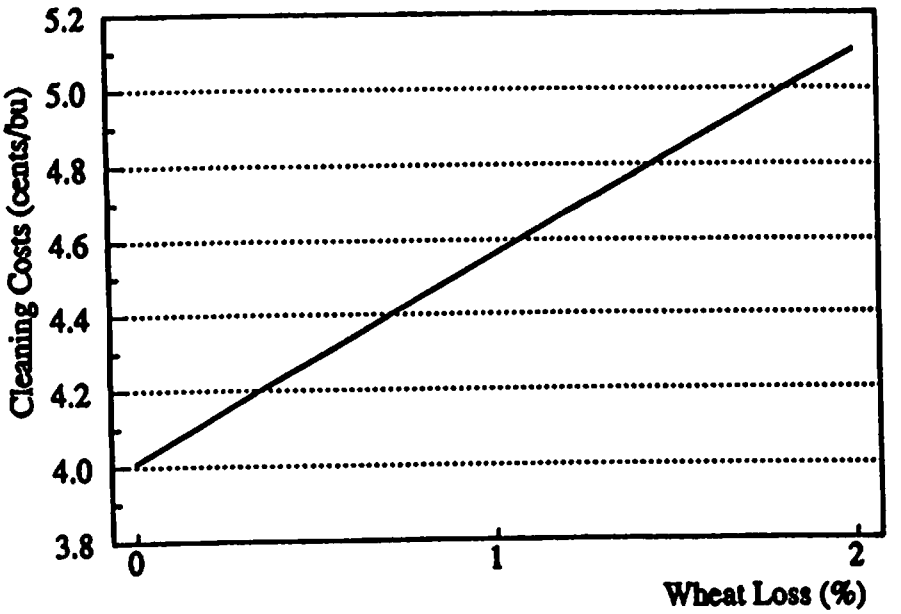


Figure 3. Effects of Wheat Loss on Cleaning Costs, With Beginning and Ending Dockage Levels of 3% and 0.7%, Respectively, 1991

Note: Cost calculated for Cleaner A.

SOURCE: Scherping et al. (1992c).

The responding elevators cleaned about 68 percent of the wheat that they handled in 1991, with an average cleaning capacity of 1,987 bushels of wheat per hour. Cleaning capacities ranged from 200 to 24,000 bushels per hour. Wheat delivered during harvest had to have a higher percentage of dockage before managers would clean; and, when it was cleaned, it was not cleaned as intensively as wheat delivered post-harvest. On average, a dockage level of 1.96 percent or less at harvest and 1.59 percent or less post-harvest was considered clean, and managers did not clean this wheat. When wheat was cleaned, it was cleaned to 0.99 percent and 0.84 percent dockage levels during harvest and post-harvest, respectively.

Wheat is cleaned because of economic incentives. Two incentives that are significant and easy to measure are revenue from the sale of screenings and reduced transport costs. These two incentives combined with the cleaning cost yield a "cleaning margin." The average cost of cleaning was 3.79 cents per bushel, and the average price received for screenings was $24.90 per ton in 1991 (Table A20).

A simple algebraic equation is used to illustrate the derivation of the cleaning margin associated with dockage removal. It is assumed that no wheat is lost during cleaning and contract specifications do not influence the cleaning decision. Given these assumptions, the following equation yields a cleaning margin:

$$(BD - ED)(S + T) - (C) = \text{cleaning margin}$$

where

BD = beginning dockage level (%)

ED = ending dockage level (%)

S = price received for wheat screenings (¢/bu)

T = cost of transportation from elevator to destination (¢/bu)

C = cost of cleaning wheat (¢/bu)

Figure 4 illustrates how the cleaning margin changes with screening values and beginning dockage levels. The cleaning margin is directly related to screening values and incoming dockage levels. Also, the cleaning margin is positively related to transport costs.

Summary and Conclusions

Premiums and discounts, like wheat price, change with respect to time, location, and current and perceived market conditions. Buyers use premiums to reflect the value of desired characteristics, and discounts to reflect the value of undesirable characteristics. The 1991 durum and HRS wheat crops compares favorably with previous years with one notable exception: the level of shrunken and broken kernels

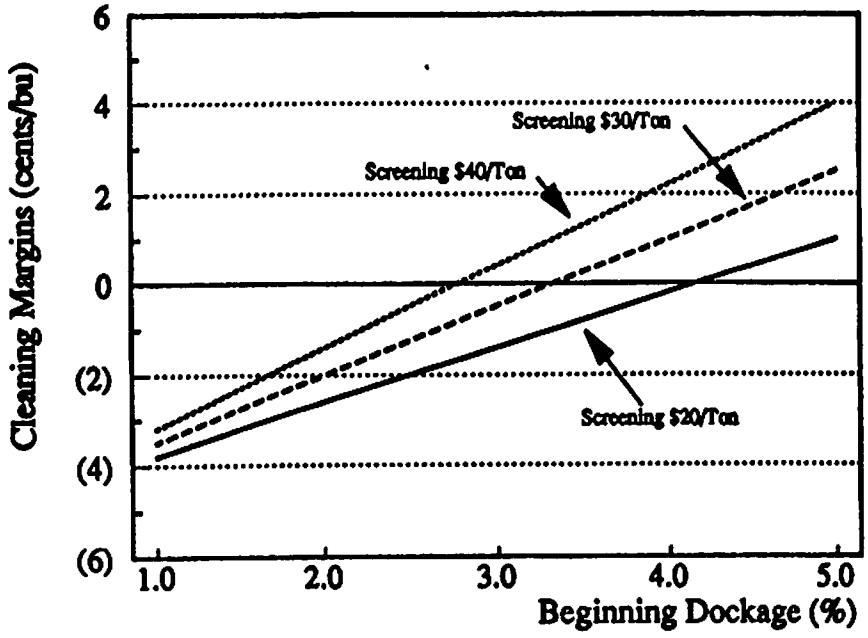


Figure 4. Cleaning Margins With Specified Screening Values, Beginning Dockage Levels and Ending Dockage Level of 0% and a Cleaning and Transport Cost of $.05/Bu and $.60/Bu, Respectively

SOURCE: Scherping et al. (1992c).

was greater in durum than in any of the previous years. All discounts for durum in 1991 were equal to or less than discounts since 1987, except for the discount for 14.5% moisture, which increased slightly.

The 1991 HRS and HRW wheat protein levels increased from 1990. The premium for 16 percent HRS decreased substantially from 1990; also, the discount for 12 percent HRS decreased. The premium for 16 percent protein HRS and the discount for 12 percent protein HRS are similar to 1989 levels, which are low compared to other years.

Grain cleanliness (dockage level) has become an issue of increasing interest and can be changed through cleaning. A NDSU study indicated that country elevators in the spring wheat region clean wheat because it is a profitable activity. Cleaning is not as apparent in other regions of the United States, indicating that it is not as profitable elsewhere.

References

Previous Pricing and Marketing Reports

Clow, Bradley B., and William W. Wilson. 1988. Pricing and Marketing Practices for North Dakota Durum and HRS Wheat, Agricultural Economics Miscellaneous Report No. 116. Fargo: North Dakota State University.

Clow, Bradley B., William W. Wilson, and Rebecca Heilman. April 1987. Pricing and Marketing Practices for North Dakota Durum and HRS Wheat 1986 Crop Year, Agricultural Economics Miscellaneous Report No. 105. Fargo: North Dakota State University, Department of Agricultural Economics.

Gunn, Steven P., and William W. Wilson. January 1986. Pricing Adjustments for Durum and HRS Wheat in North Dakota 1985, Agricultural Economics Miscellaneous Report No. 91. Fargo: North Dakota State University, Department of Agricultural Economics.

Gunn, Steven P., and William W. Wilson. January 1986. Grading and Pricing Practices of North Dakota Country Elevators for Durum and Hard Red Spring Wheat, Agricultural Economics Report No. 206. Fargo: North Dakota State University, Department of Agricultural Economics.

Hesley, Jay T., and William W. Wilson. June 1990. Pricing and Marketing Practices for North Dakota Durum and HRS Wheat 1989 Crop Year, Agricultural Economics Miscellaneous Report No. 129. Fargo: North Dakota State University, Department of Agricultural Economics.

Scherping, Daniel J., and William W. Wilson. 1990. Pricing and Marketing Practices For North Dakota Durum and HRS Wheat: 1990 Crop Year, Agricultural Economics Miscellaneous Report No. 159. Fargo: North Dakota State University, Department of Agricultural Economics.

Wilson, William W. 1989. Pricing and Marketing Practices for North Dakota Durum and HRS Wheat 1988 Crop Year, Agricultural Economics Report No. 123. Fargo: North Dakota State University, Department of Agricultural Economics.

NDSU: Wheat Dockage Study Reports

Johnson, D., and W. Wilson. 1992a. Measuring the Impact of Dockage on Foreign Demand for U.S. Wheat. Agricultural Economics Report No. 284. Fargo: North Dakota State University, Department of Agricultural Economics.

Johnson, D., D. Scherping, and W. Wilson. 1992b. Wheat Cleaning Decisions at Country Elevators. Agricultural Economics Report No. 280. Fargo: North Dakota State University, Department of Agricultural Economics.

Scherping, D., D. Cobia, D. Johnson, and W. Wilson. 1992c. Wheat Cleaning and Grain Merchandising. Agricultural Economics Report No. 282. Fargo: North Dakota State University, Department of Agricultural Economics.

Wilson, W., D. Scherping, D. Johnson, and D. Cobia. 1992d. Impacts of Alternative Policies Regulating Dockage. Agricultural Economics Report No. 285. Fargo: North Dakota State University, Department of Agricultural Economics.

Other References

Department of Cereal Science and Food Technology, 1984-1990. Durum and HRS Wheat Regional Quality Reports. Fargo: North Dakota State University.

U.S. Department of Agriculture, ERS. February 1992. Situation and Outlook Report. Washington, D.C.

Appendix A

TABLE A1. NUMBER AND PERCENTAGE OF RESPONSES FROM NINE REGIONS ACROSS NORTH DAKOTA, 1991

Region	Number of Elevators Receiving Questionnaires	Number of Usable Surveys Received	Percentage Responding
1. Northwest	54	14	26
2. North Central	44	5	11
3. Northeast	121	23	19
4. West Central	18	3	17
5. Central	46	13	28
6. East Central	91	15	16
7. Southwest	29	7	24
8. South Central	26	7	27
9. Southeast	80	13	16
Total	509	100	20

SOURCE: Question 2, Grain Marketing Questionnaire, Fall 1991, Fargo, NDSU, Department of Agricultural Economics.

TABLE A2. OWNERSHIP STRUCTURE OF RESPONDING ELEVATORS, 1991

Types	Number	Percentage
Cooperatives	66	66
Private	34	34
Total	100	100

SOURCE: Question 3a, Grain Marketing Questionnaire, Fall 1991, Fargo, NDSU, Department of Agricultural Economics.

TABLE A3. NUMBER OF ELEVATORS THAT ARE SINGLE-FACILITY OR PART OF A MULTI-FACILITY ELEVATOR, 1991

Type	Number	Percentage
Single-facility (location)	68	68
Multi-facility (location)	28	28
Nonresponse	4	4
Total	100	100

SOURCE: Question 3b, Grain Marketing Questionnaire, Fall 1991, Fargo, NDSU, Department of Agricultural Economics.

TABLE A4. LOAD-OUT CAPACITY OF RESPONDING ELEVATORS, 1991

Load-out Capacity	Number	Percentage
6 or less cars/day	26	26
7 to 26 cars/day	53	53
27 to 54 cars/day	14	14
More than 54 cars/day	7	7
Total	100	100

SOURCE: Question 4, Grain Marketing Questionnaire, Fall 1991, Fargo, NDSU, Department of Agricultural Economics.

TABLE A5. DISTANCE TO NEAREST COMPETITION OF RESPONDING ELEVATORS, 1991

Distance to Competition	Number	Percentage
Less than 5 miles	33	33
6 to 10 miles	42	42
More than 10 miles	25	25
Total	100	100

SOURCE: Question 5, Grain Marketing Questionnaire, Fall 1991, Fargo, NDSU, Department of Agricultural Economics.

TABLE A6. STORAGE CAPACITY OF RESPONDING ELEVATORS, 1991

Storage Capacity	Number	Percentage
Less than 100,000 bushels	10	10
100,000 to 199,000 bushels	13	13
200,000 to 299,000 bushels	13	13
300,000 to 399,000 bushels	16	16
400,000 to 999,000 bushels	34	34
Over 1,000,000 bushels	14	14
Total	100	100

SOURCE: Question 6, Grain Marketing Questionnaire, Fall 1991, Fargo, NDSU, Department of Agricultural Economics.

TABLE A7. MARKET SHARES OF COMMISSION COMPANIES AND TRACK BUYERS BY RESPONDING ELEVATORS FOR DURUM AND HRS WHEAT, 1991

Company	Durum	HRS Wheat
	------percent-------	
Harvest States	40	34
Atwood-Larson	13	11
Benson-Quinn	12	8
Kellogg	9	8
Cargill	6	10
Peavey	10	14
Continental	1	2
International Multifoods	0	3
North Dakota State Mill	4	1
Others	5	9

SOURCE: Question 7, Grain Marketing Questionnaire, Fall 1991, Fargo, NDSU, Department of Agricultural Economics.

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

TABLE A8. MARKET SHARES OF COMMISSION COMPANIES AND TRACK BUYERS BY REGION FROM RESPONDING ELEVATORS FOR DURUM AND HRS WHEAT, 1991

Commodity (Base Grade)	Company	Region 1	2	3	4	5	6	7	8	9
		percent								
Durum	Harvest States	48	64	28	57	32	8	74	80	51
	Atwood-Larson	8	0	12	37	7	16	23	10	18
	Benson-Quinn	8	25	16	0	18	23	0	0	3
	Kellogg	0	0	15	0	25	2	0	10	10
	Cargill	5	1	6	2	5	25	0	0	0
	Peavey	7	0	17	0	14	0	33	0	19
	Continental	1	0	0	2	0	3	3	0	0
	IMF	0	0	0	0	0	0	0	0	0
	ND State Mill	9	9	5	3	0	2	1	0	0
	Other	5	0	1	0	0	21	3	0	0
HRS	Harvest States	65	57	18	53	15	14	40	20	57
	Atwood-Larson	4	0	15	37	0	2	7	28	22
	Benson-Quinn	0	20	16	0	13	8	0	0	1
	Kellogg	0	0	13	0	16	1	0	29	1
	Cargill	8	20	5	2	14	31	14	0	0
	Peavey	1	0	20	5	30	22	8	3	9
	Continental	0	0	1	2	0	9	4	0	0
	IMF	0	0	10	0	0	4	0	0	0
	Others	10	2	2	0	11	9	24	18	6

SOURCE: Questions 2 and 7, Grain Marketing Questionnaire, Fall 1991, Fargo, NDSU, Department of Agricultural Economics.

TABLE A9. MARKET SHARES OF COMMISSION COMPANIES AND TRACK BUYERS BY ORGANIZATION FROM RESPONDING ELEVATORS FOR DURUM AND HRS WHEAT, 1991

Commodity (Base Grade)	Company	Investor-Owned Firm	Cooperative
		--------percent-------	
Durum	Harvest States	7	53
	Atwood-Larson	10	13
	Benson-Quinn	7	16
	Kellogg	19	6
	Cargill	17	2
	Peavey	29	3
	Continental	1	0
	IMF	0	0
	ND State Mill	2	4
	Others	8	8
		100	100
HRS	Harvest States	5	46
	Atwood-Larson	5	13
	Benson-Quinn	5	9
	Kellogg	21	2
	Cargill	24	5
	Peavey	26	9
	Continental	3	1
	IMF	2	3
	Others	9	12
		100	100

SOURCE: Questions 3 and 7, Grain Marketing Questionnaire, Fall 1991, Fargo, NDSU, Department of Agricultural Economics.

TABLE A10. MARKET SHARES OF COMMISSION COMPANIES AND TRACK BUYERS BY SIZE OF ELEVATORS FOR DURUM AND HRS WHEAT, 1991

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 999,000	Over 1,000,000
		percent					
Durum	Harvest States	90	21	40	53	45	23
	Atwood-Larson	0	13	19	11	13	8
	Benson-Quinn	0	13	9	20	15	10
	Kellogg	0	25	10	5	4	14
	Cargill	0	0	0	1	5	21
	Peavey	0	22	11	6	7	13
	Continental	0	1	0	0	0	1
	IMF	0	0	0	0	0	0
	ND State Mill	0	0	10	2	4	3
	Other	10	5	1	2	7	7
HRS	Harvest States	44	28	48	40	31	27
	Atwood-Larson	4	0	21	17	13	1
	Benson-Quinn	0	11	0	14	9	5
	Kellogg	36	17	11	7	1	7
	Cargill	0	9	0	1	13	26
	Peavey	4	17	13	8	14	19
	Continental	0	2	0	0	1	5
	IMF	0	0	0	4	5	0
	Others	12	16	7	9	13	10

SOURCE: Questions 6 and 7, Grain Marketing Questionnaire, Fall 1991, Fargo, NDSU, Department of Agricultural Economics.

TABLE A11. MARKET SHARES COMMISSION COMPANIES AND TRACK BUYERS BY LOAD-OUT CAPACITY FROM RESPONDING ELEVATORS FOR DURUM AND HRS WHEAT, 1991

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	67	34	20	71
	Atwood-Larson	1	16	18	0
	Benson-Quinn	0	16	20	0
	Kellogg	15	12	1	0
	Cargill	1	2	12	23
	Peavey	6	12	15	0
	Continental	1	1	1	0
	IMF	0	0	0	0
	ND State Mill	8	3	5	0
	Other	1	4	8	6
HRS	Harvest States	50	29	16	64
	Atwood-Larson	1	15	17	0
	Benson-Quinn	6	9	12	0
	Kellogg	20	6	1	0
	Cargill	5	8	26	11
	Peavey	3	17	16	12
	Continental	1	1	5	2
	IMF	0	5	0	0
	Others	14	10	7	11

*Totals may not add to 100 due to rounding.

SOURCE: Questions 5 and 7, Grain Marketing Questionnaire, Fall 1991, Fargo, NDSU, Department of Agricultural Economics.

TABLE A12. AVERAGE BOARD PRICE FOR NO. 1 HARD AMBER DURUM AND NO. 1 DNS 14 PERCENT PROTEIN HRS WHEAT AMONG RESPONDING ELEVATORS IN EACH REGION, JANUARY 16, 1992

Region	Average Durum Price	Average HRS Wheat Price
1. Northwest	298	334
2. North Central	301	347
3. Northeast	309	365
4. West Central	300	342
5. Central	308	363
6. East Central	304	370
7. Southwest	297	341
8. South Central	284	345
9. Southeast	317	371
State Average	302	353

SOURCE: Questions 15 and 17, Grain Marketing Questionnaire, Fall 1991, Fargo, NDSU, Department of Agricultural Economics.

TABLE A13. QUALITY OF 1986, 1987, 1988, 1989, 1990, AND 1991 DURUM AND HRS WHEAT CROPS

Commodity (Base Grade)	Factor	Average Values 1986	1987	1988	1989	1990	1991
Durum	Test weight (lbs)	59.3	58.5	60.4	60.7	61.0	60.1
	Moisture %	12.4	12.2	10.9	11.2	11.6	10.9
	Grade	2 HAD	2 HAD	2 HAD	1 HAD	1 HAD	1 HAD
	Shrunken & broken kernels %	1.2	0.9	0.9	1.6	1.1	1.9
	Foreign material %	0.1	0.2	0.3	0.1	0.1	0.1
	Damaged kernels %	0.8	1.5	0.3	0.1	0.1	0.5
	Contrasting classes %	0.4	0.6	0.7	0.5	0.7	0.4
HRS	Test weight (lbs)	58.7	58.9	60.2	60.2	61.3	60.1
	Moisture %	12.4	12.2	10.6	11.1	11.7	11.7
	Protein %	14.6	14.9	16.6	16.0	14.4	16.6
	Shrunken & broken kernels %	1.6	1.3	1.9	1.9	1.2	1.6
	Foreign material %	0.0	0.2	0.1	0.0	0.1	0.1
	Damaged kernels %	0.6	0.6	0.1	0.1	0.4	0.3
	Contrasting classes %	0.0	.0	0.2	0.0	0.1	0.1

SOURCE: 1986, 1987, 1988, 1989, 1990, and 1991 durum wheat and HRS wheat regional quality reports, Department of Cereal Science and Food Technology, North Dakota State University, Fargo.

TABLE A14. AVERAGE PRICE ADJUSTMENTS FOR EACH FACTOR AMONG RESPONDING NORTH DAKOTA COUNTRY ELEVATORS

Commodity (Base Grade)	Factor	1984	1985	1986	1987	1988	1989	1990	1991
		¢/bu							
Durum #1 HAD	58 lbs test weight	-2.2	-2.2	-2.7	-7.0	-10.7	-6.4	-4.5	-3.6
	14.5% moisture	-6.0	-7.6	-7.2	-7.3	-7.8	-7.1	-5.2	-5.4
	Amber durum	-5.7	-16.7	-21.0	-22.6	-26.8	-15.3	-10.2	-9.7
	4% damaged kernels	-6.0	-6.9	-8.4	-8.9	-12.8	-10.7	-8.4	-7.1
	1% foreign material	-2.8	-1.9	-1.9	-2.4	-2.9	-3.2	-2.0	-2.0
	5% shrunken & broken kernels	-6.6	-3.9	-5.0	-4.8	-5.9	-5.6	-3.9	-3.8
	2% contrasting classes	-2.0	-4.4	-4.8	-5.0	-6.6	-5.5	-4.9	-4.5
	5% wheat of other classes	--	-9.9	-11.7	-11.8	-16.2	-12.4	-9.4	-8.9
HRS #1 DNS 14% Protein	57 lbs test weight	-1.9	-1.8	-2.9	-3.2	-3.6	-2.5	-2.2	-2.0
	14.5% moisture	-5.9	-6.8	-6.5	-7.5	-5.7	-5.9	-5.0	-4.5
	16% protein	41.0	63.4	62.6	86.8	9.7	0.7	34.6	2.3
	12% protein	-38.0	-67.4	-43.9	-38.5	-12.6	-1.5	-10.0	-2.3
	4% damaged kernels	-2.0	-6.6	-8.9	-8.4	-10.5	-9.5	-9.4	-6.3
	1% foreign material	-1.4	-1.3	-1.7	-2.0	-1.8	-2.0	-1.6	-1.3
	5% shrunken & broken kernels	-2.2	-3.0	-4.2	-4.1	-4.7	-4.1	-3.0	-2.4
	2% contrasting classes	-1.6	-3.2	-3.5	-3.7	-4.6	-3.6	-2.8	-2.6
	5% wheat of other classes	--	-7.0	-8.6	-9.1	-9.6	-8.1	-6.3	-5.8

SOURCE: Questions 16 and 18, Grain Marketing Questionnaire, Fall 1991, Fargo, NDSU, Department of Agricultural Economics.

TABLE A15. PRICE ADJUSTMENT AVERAGES FOR DURUM AND HRS WHEAT AMONG ELEVATORS OF SPECIFIED REGIONS IN NORTH DAKOTA (FALL 1991)

Commodity (Base Grade)	Company	Region 1	2	3	4	5	6	7	8	9
		¢/bu								
Durum	58 lbs test weight	-3	-3	-4	-4	-4	-5	-5	-3	-4
#1 HAD	14.5% moisture	-5	-4	-6	-3	-5	-6	-12	-2	-6
	Amber durum	-9	-8	-8	-8	-11	-10	-12	-15	-9
	4% damaged kernels	-8	-7	-7	-6	-7	-7	-10	-8	-6
	1% foreign material	-2	-3	-2	-2	-3	-3	-1	-2	-2
	5% shrunken & broken kernels	-5	-5	-3	-2	-4	-2	-2	-7	-3
	2% contrasting classes	-5	-5	-3	-5	-6	-3	-7	-9	-3
	5% wheat of other classes	-10	-8	-7	-10	-8	-8	-18	-15	-6
HRS	57 lbs test weight	-2	-2	-2	-2	-2	-2	-2	-2	-2
#1 DNS	14.5% moisture	-6	-4	-6	0	-3	-4	-1	-3	-6
14% Protein	16% protein	5	0	2	5	2	1	6	2	1
	12% protein	-10	0	0	-13	0	0	-8	0	0
	4% damaged kernels	-8	-6	-7	-4	-7	-5	-5	-6	-6
	1% foreign material	-2	-2	-1	-1	-3	-2	-1	-1	-1
	5% shrunken & broken kernels	-4	-4	-2	-1	-3	-2	-2	-3	-2
	2% contrasting classes	-4	-3	-2	-7	-3	-2	-2	-3	-1
	5% wheat of other classes	-10	-5	-6	-4	-7	-5	-4	-8	-2

SOURCE: Questions 2, 16, and 18, Grain Marketing, Questionnaire Fall 1991, Fargo, NDSU, Department of Agricultural Economics.

TABLE A16. PRICE ADJUSTMENT AVERAGES FOR DURUM AND HRS WHEAT AMONG SELECTED TYPES OF ELEVATOR STRUCTURE ORGANIZATIONS (1991)

Commodity (Base Grade)	Factor	Co-op	Investor-Oriented Firms
		---------¢/bu.---------	
Durum #1 HAD	58 lbs. test weight	-3	-4
	14.5% moisture	-5	-5
	Amber durum	-9	-11
	4% damaged kernels	-7	-7
	1% foreign material	-2	-2
	5% shrunken and broken kernels	-4	-4
	2% contrasting classes	-4	-5
	5% wheat of other classes	-9	-6
HRS #1 DNS 14% Protein	57 lbs. test weight	-2	-2
	14.5% moisture	-4	-5
	16% protein	2	3
	12% protein	-2	-3
	4% damaged kernels	-5	-7
	1% foreign material	-1	-1
	5% shrunken and broken kernels	-2	-3
	2% contrasting classes	-2	-3
	5% wheat of other classes	-5	-6

SOURCE: Questions 2, 16, and 18, Grain Marketing, Questionnaire Fall 1991, Fargo, NDSU, Department of Agricultural Economics.

TABLE A17. PRICE ADJUSTMENT AVERAGES FOR DURUM AND HRS WHEAT AMONG ELEVATORS WITH SELECTED LOAD-OUT CAPACITIES (1991)

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	-2	-4	-4	-3
	14.5% moisture	-4	-5	-7	-9
	Amber durum	-10	-10	-9	-9
	4% damaged kernels	-8	-7	-8	-8
	1% foreign material	-2	-2	-2	-2
	5% shrunken and broken kernels	-5	-4	-3	-3
	2% contrasting classes	-7	-4	-4	-5
	5% wheat of other classes	-10	-9	-6	-10
HRS #1 DNS 14% Protein	57 lbs. test weight	-2	-2	-2	-2
	14.5% moisture	-3	-4	-6	-6
	16% protein	4	3	0	1
	12% protein	-3	-3	0	0
	4% damaged kernels	-6	-6	-7	-8
	1% foreign material	-2	-1	-1	-1
	5% shrunken and broken kernels	-2	-3	-3	-0
	2% contrasting classes	-4	-3	-2	-2
	5% wheat of other classes	-6	-6	-5	-5

SOURCE: Questions 4, 16, and 18, Grain Marketing Questionnaire, Fall 1991, Fargo, NDSU, Department of Agricultural Economics.

TABLE A18. PRICE ADJUSTMENT AVERAGES FOR DURUM AND HRS WHEAT AMONG ELEVATORS WITH SELECTED DISTANCES TO NEAREST COMPETITION (1991)

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

SOURCE: Questions 5, 16, and 18, Grain Marketing Questionnaire, Fall 1991 Fargo, NDSU, Department of Agricultural Economics.

TABLE A19. PRICE ADJUSTMENT AVERAGES FOR DURUM AND HRS WHEAT AMONG ELEVATORS WITH SELECTED STORAGE CAPACITIES (1991)

Commodity (Base Grade)	Factor	Bushels					
		Less Than 0 to 99,000	100,000 to 199,000	200,000 to 299,000	300,000 to 399,000	400,000 to 999,000	Over 1,000,000
		¢/bu					
Durum #1 HAD	58 lbs test weight	-3	-3	-3	-3	-4	-4
	14.5% moisture	-2	-3	-6	-6	-6	-6
	4% damaged kernels	-10	-7	-12	-7	-11	-11
	4% damaged kernels	-8	-7	-8	-7	-6	-9
	1% foreign material	-2	-2	-2	-2	-2	-3
	5% shrunken & broken kernels	-6	-3	-5	-3	-4	-3
	2% contrasting classes	-4	-3	-8	-3	-4	-5
	5% wheat of other classes	-10	-8	-10	-7	-10	-7
HRS #1 DNS 14% Protein	57 lbs test weight	-2	-2	-2	-2	-2	-2
	14.5% moisture	-2	-3	-6	-4	-5	-5
	16% protein	5	4	3	2	2	1
	12% protein	-4	-3	-5	-2	-2	0
	4% damaged kernels	-7	-5	-7	-5	-7	-7
	1% foreign material	-1	-2	-1	-1	-1	-2
	5% shrunken & broken kernels	-3	-1	-4	-2	-2	-2
	2% contrasting classes	-5	-2	-4	-3	-2	-2
	5% wheat of other classes	-6	-4	-10	-6	-5	-6

SOURCE: Questions 6, 16, and 18, Grain Marketing Questionnaire, Fall 1991, Fargo, NDSU, Department of Agricultural Economics.

TABLE A20. AVERAGE, HIGH, AND LOW CLEANING COSTS AND WHEAT SCREENING PRICES

Item	1987			1988			1989			1990			1991		
	Avg	High	Low	Avg	High	Low	Avg	High	Low	Avg	High	Low	Avg	High	Low
	¢/bu														
Cleaning costs	3.50	20.00	0.0	4.00	20.00	0.00	4.64	30.00	0.00	4.37	25.00	0.00	3.79	20.00	0.00
	$/ton														
Prices received	9.90	30.00	0.0	26.94	45.00	10.00	30.27	50.00	5.00	29.54	50.00	15.00	24.91	40.00	10.00

SOURCE: Questions 12 and 14, Grain Marketing Questionnaire, Fall 1991, Fargo, NDSU, Department of Agricultural Economics.

Appendix B

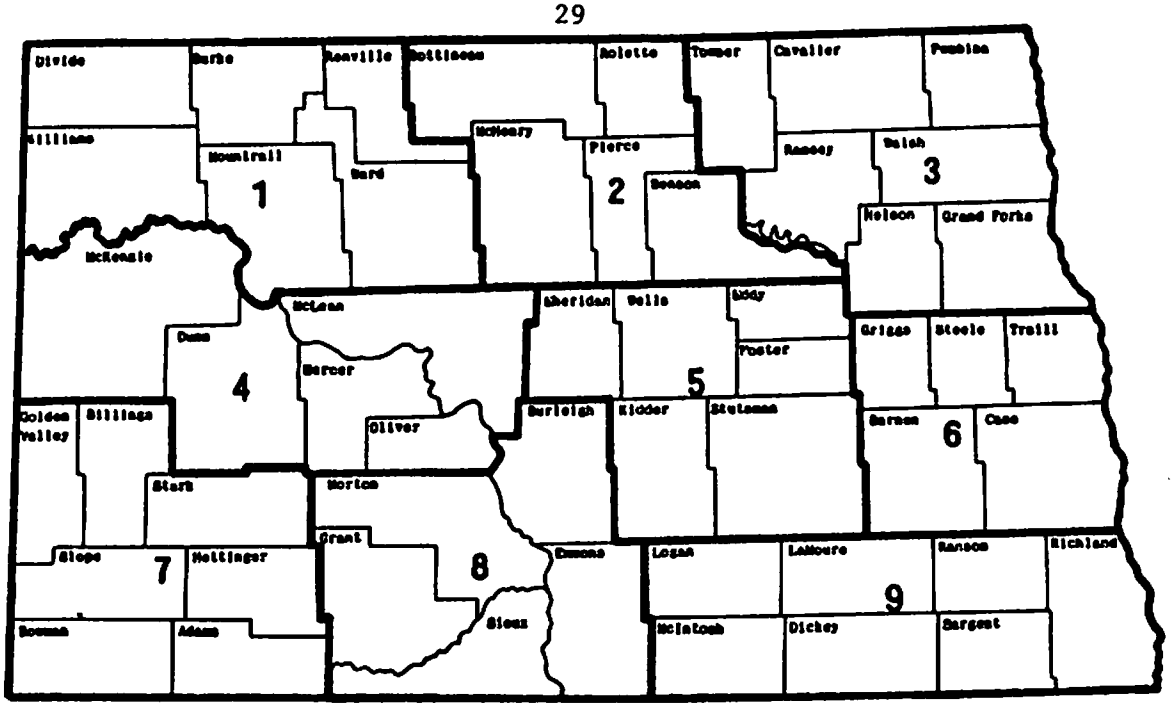


Figure B1. Nine Regions Used to Divide Responding Elevators by Location in the State

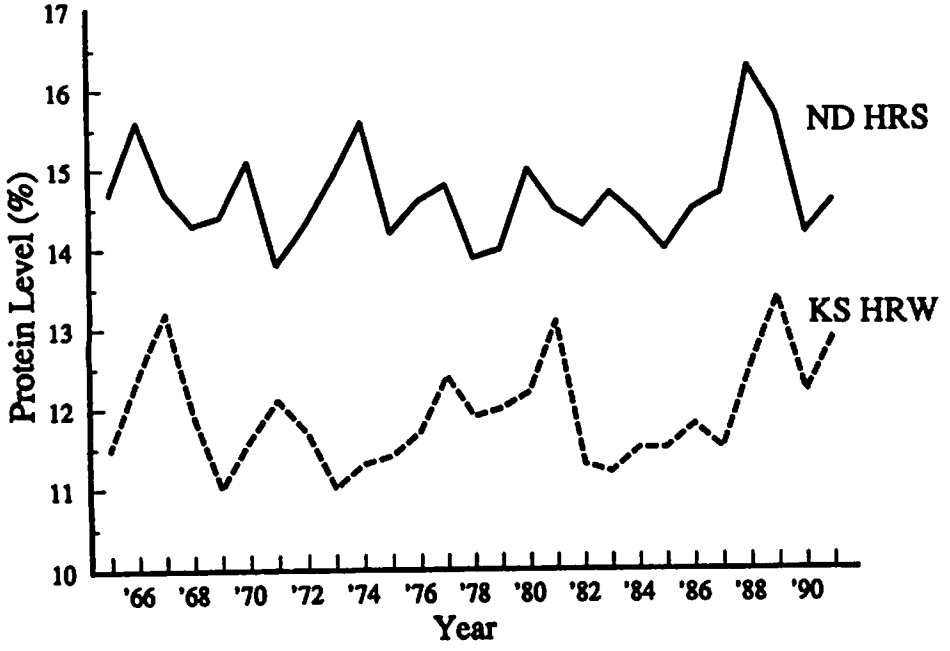


Figure B2. HRS and HRW Average Protein Level, on a 12% Moisture Basis, North Dakota and Kansas, Respectively

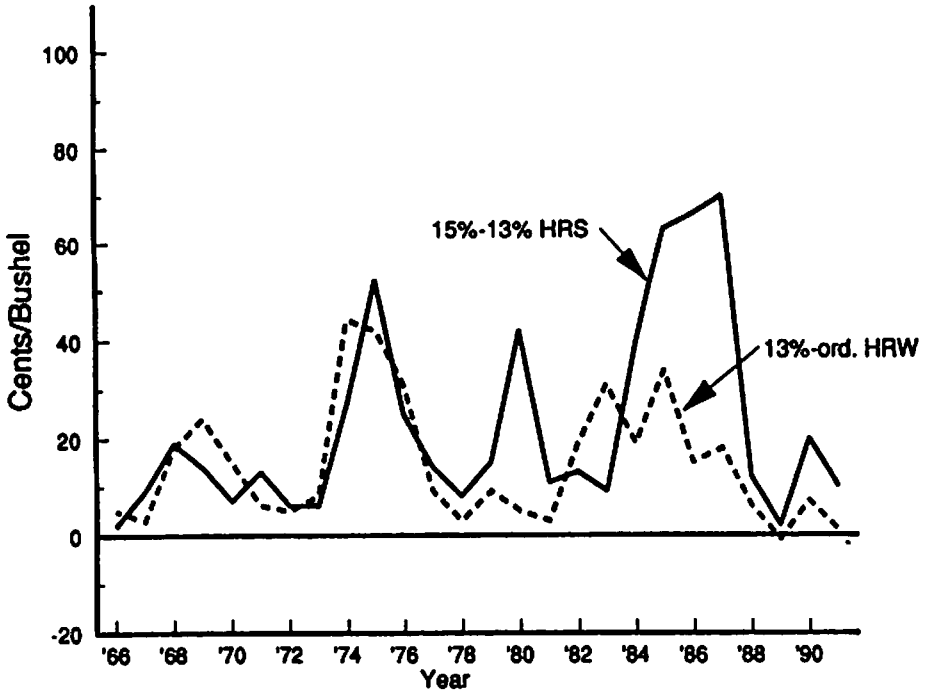


Figure B3. HRS and HRW Market Protein Premium

SOURCE: USDA/ERS.

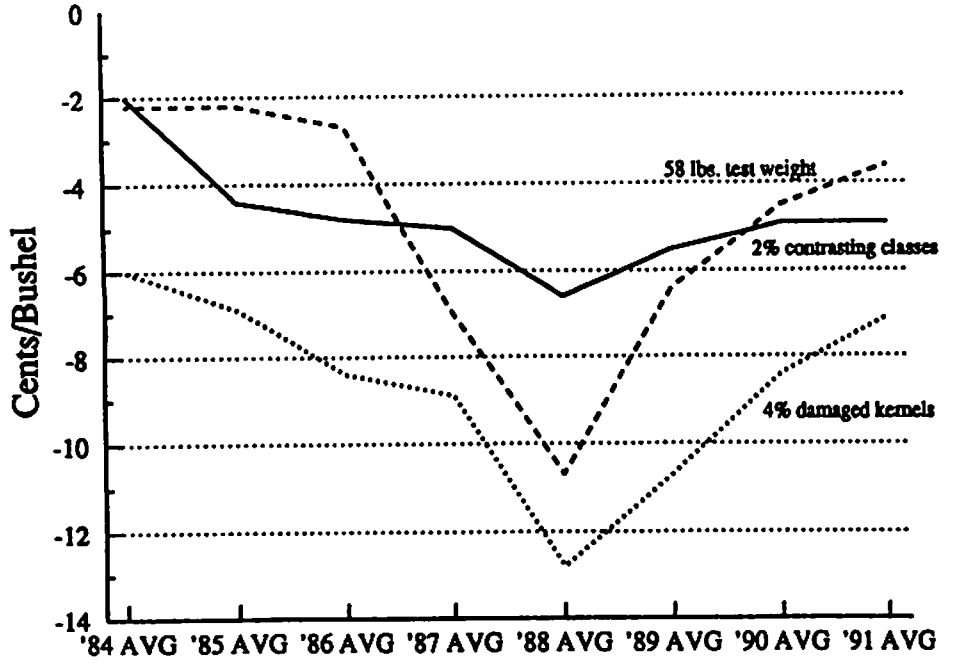


Figure B4. Average Price Adjustments Among North Dakota Country Elevators, Durum (#1 HAD)

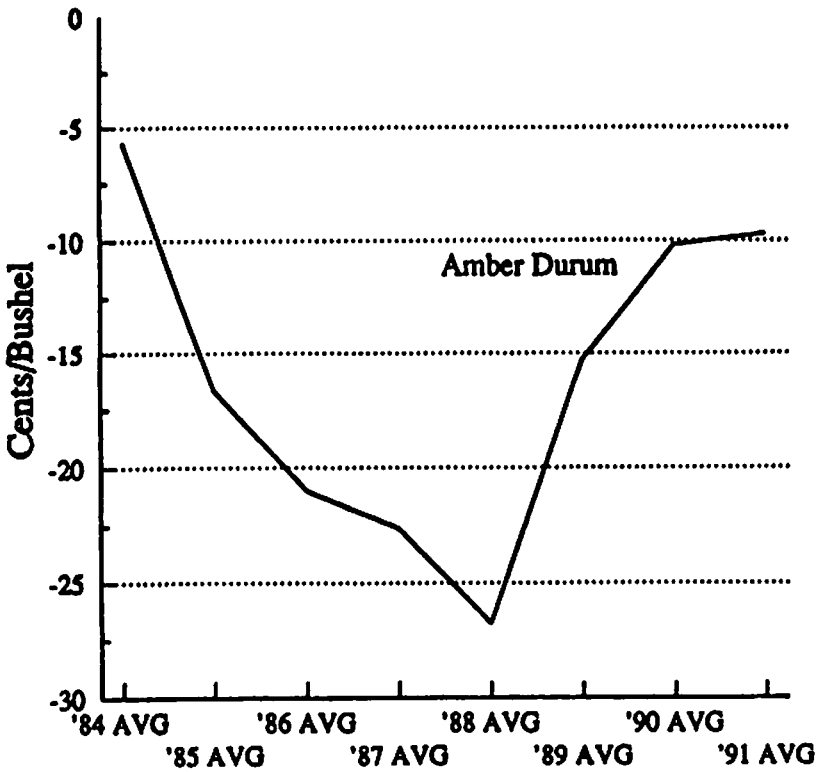


Figure B5. Average Price Adjustment Among North Dakota Country Elevators, Durum (#1 HAD)

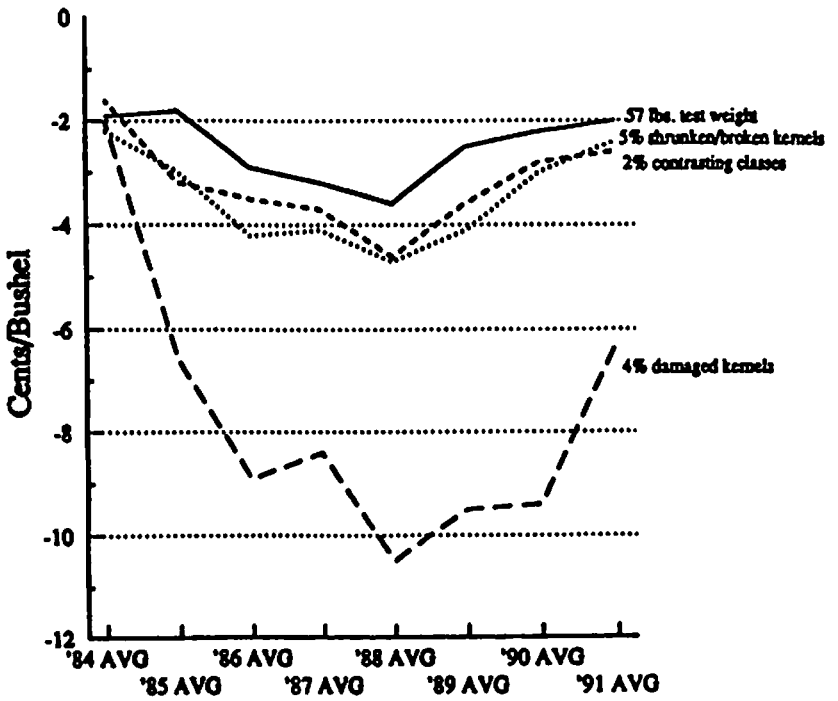


Figure B6. Average Price Adjustments Among North Dakota Country Elevators, HRS (#1 DNS) 14% Protein

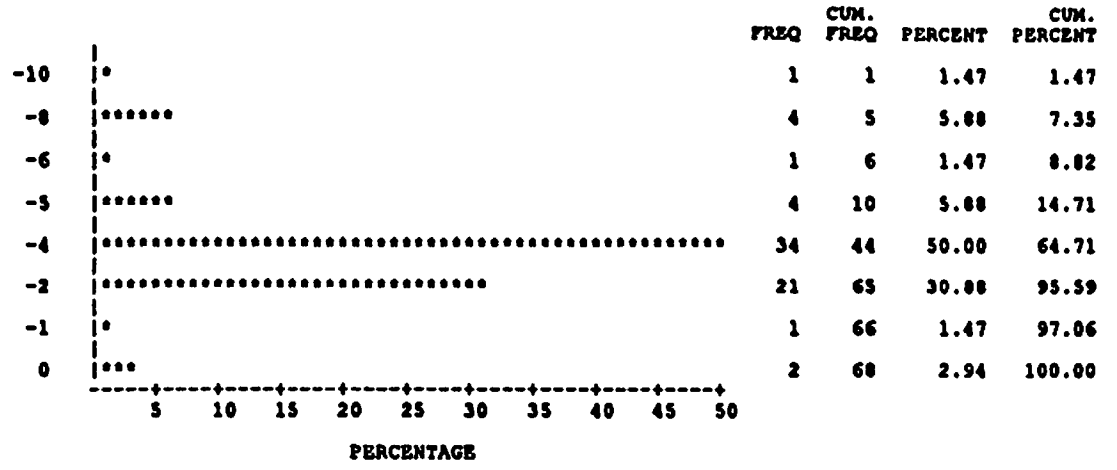


Figure B7. Frequency of Discounts for 58-lb. Test Weight in Durum Wheat

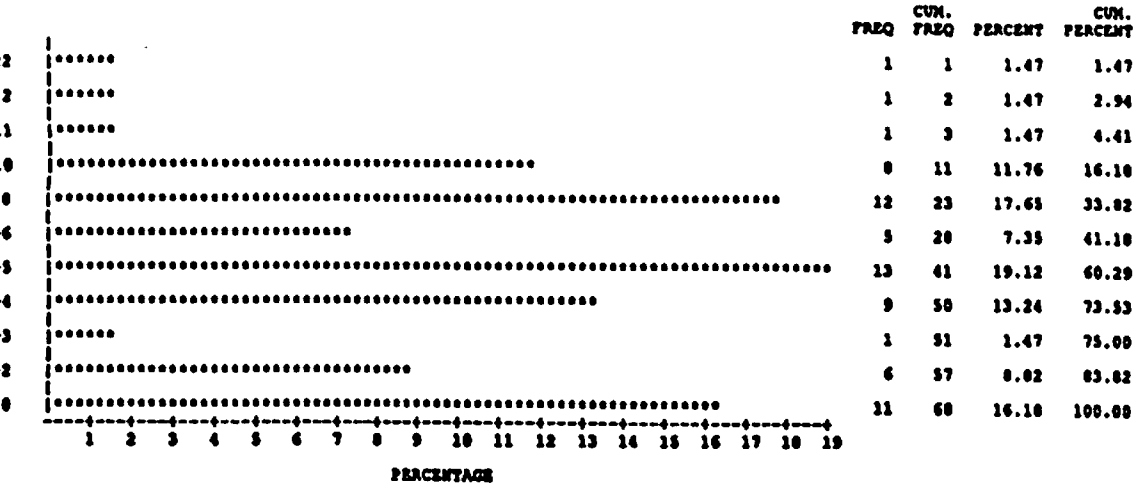
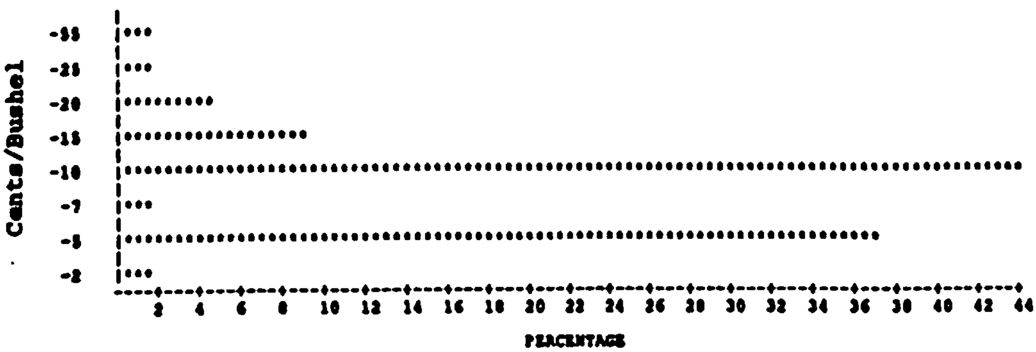
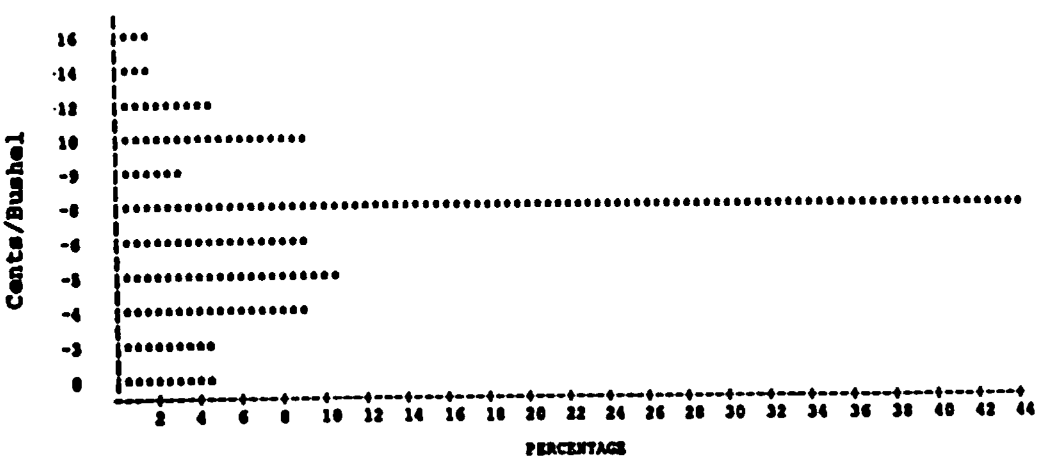


Figure B8. Frequency of Discounts for 14.5 Percent Moisture in Durum Wheat



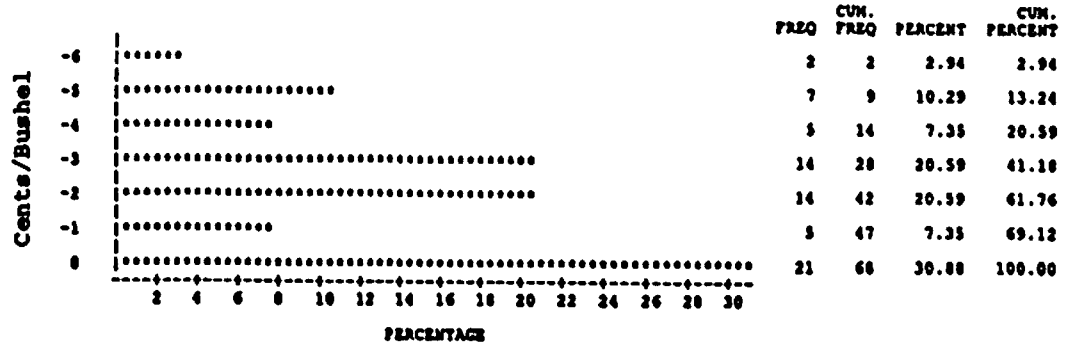
Cents/Bushel	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
-35	1	1	1.47	1.47
-25	1	2	1.47	2.94
-20	3	5	4.41	7.35
-15	6	11	8.82	16.18
-10	30	41	44.12	60.29
-7	1	42	1.47	61.76
-5	25	67	36.76	98.53
-2	1	68	1.47	100.00

Figure B9. Frequency of Discounts for Amber Durum Wheat



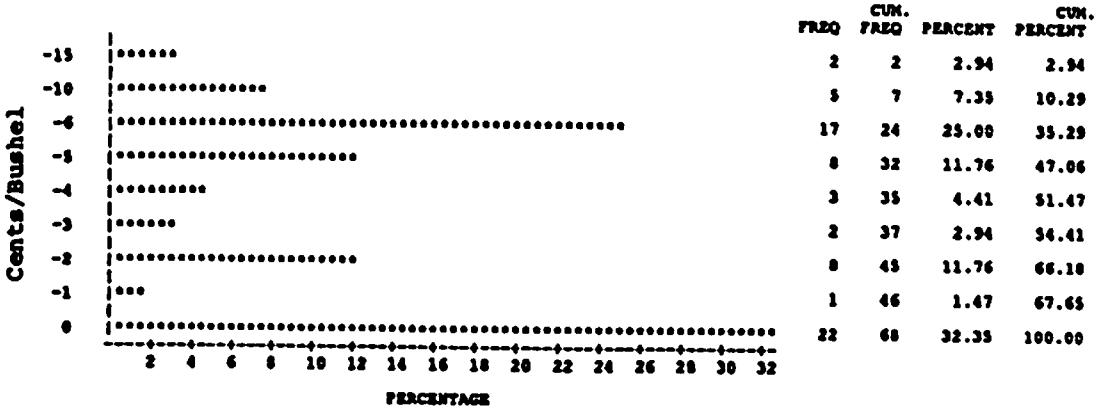
Cents/Bushel	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
16	1	1	1.47	1.47
-14	1	2	1.47	2.94
-12	3	5	4.41	7.35
10	6	11	8.82	16.18
-9	2	13	2.94	19.12
-8	30	43	44.12	63.24
-6	6	49	8.82	72.06
-5	7	56	10.29	82.35
-4	6	62	8.82	91.18
-3	3	65	4.41	95.59
0	3	68	4.41	100.00

Figure B10. Frequency of Discounts for 4 Percent Total Damage in Durum Wheat



	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
-6	2	2	2.94	2.94
-5	7	9	10.29	13.24
-4	5	14	7.35	20.59
-3	14	28	20.59	41.18
-2	14	42	20.59	61.76
-1	5	47	7.35	69.12
0	21	68	30.88	100.00

Figure B11. Frequency of Discounts for 1 Percent Foreign Material in Durum Wheat



	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
-15	2	2	2.94	2.94
-10	5	7	7.35	10.29
-6	17	24	25.00	35.29
-5	8	32	11.76	47.06
-4	3	35	4.41	51.47
-3	2	37	2.94	54.41
-2	8	45	11.76	66.18
-1	1	46	1.47	67.65
0	22	68	32.35	100.00

Figure B12. Frequency of Discounts for 5 Percent Shrunken and Broken Kernels in Durum Wheat

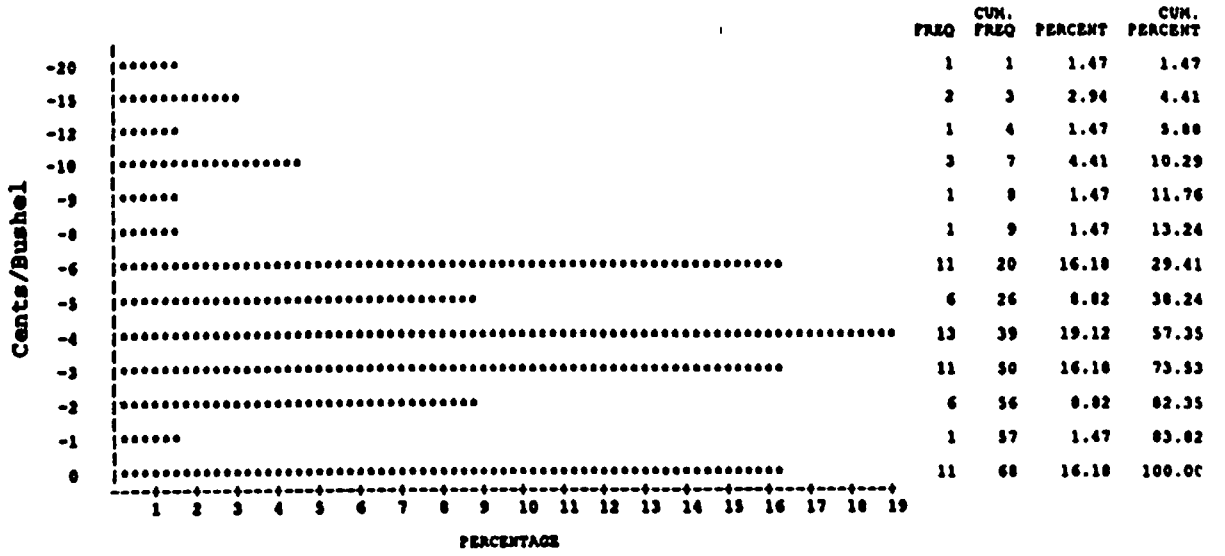


Figure B13. Frequency of Discounts for 2 Percent Contrasting Classes in Durum Wheat

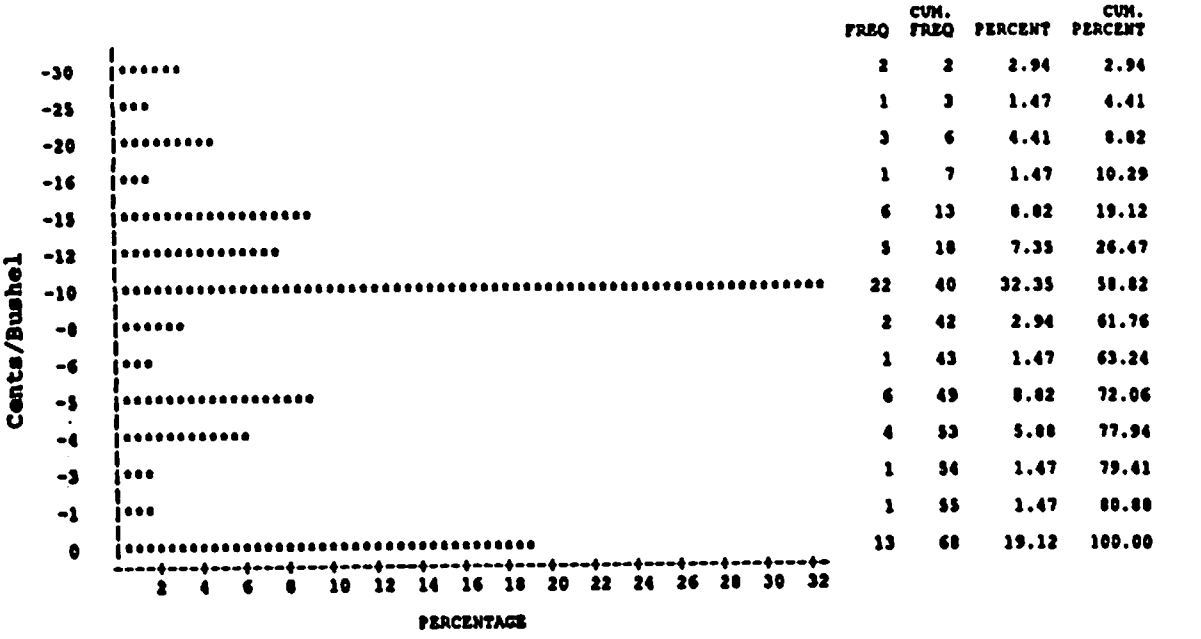
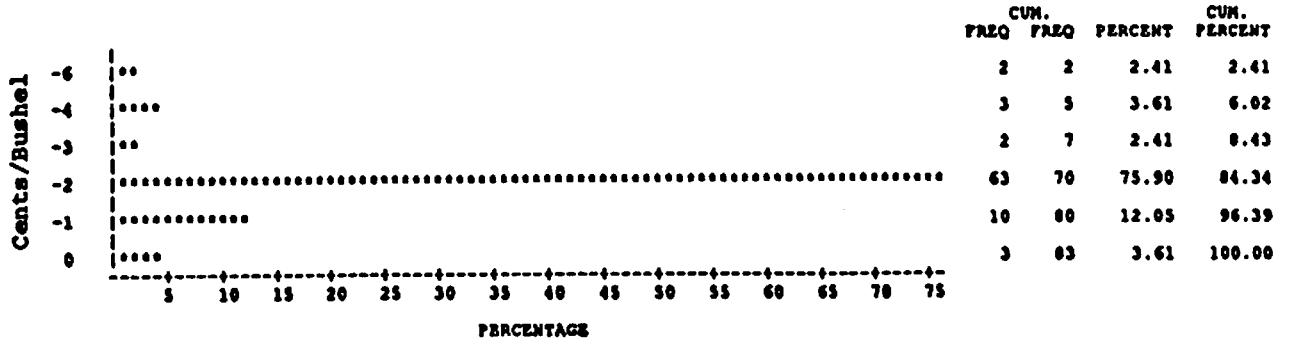
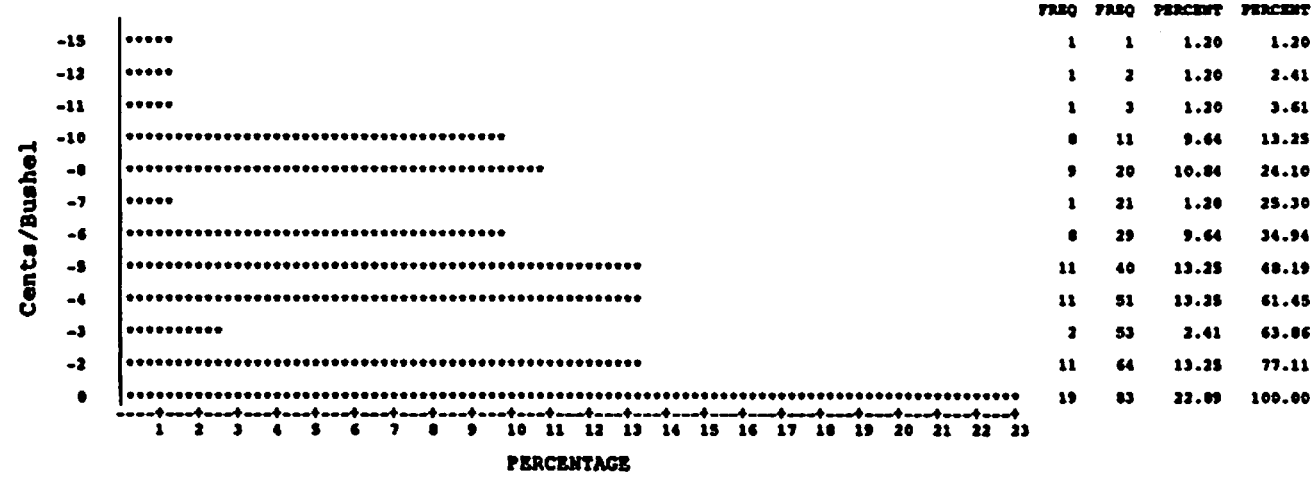


Figure B14. Frequency of Discounts for 5 Percent Wheat of Other Classes in Durum Wheat



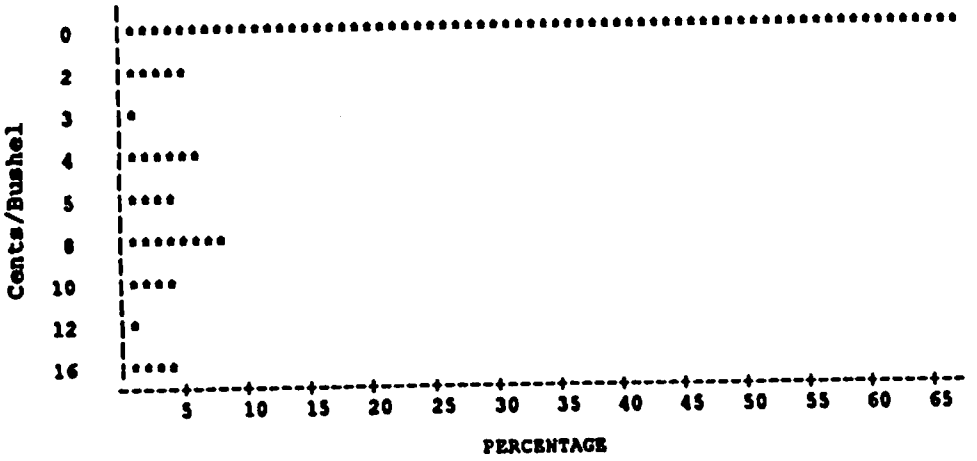
	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
-6	2	2	2.41	2.41
-4	3	5	3.61	6.02
-3	2	7	2.41	8.43
-2	63	70	75.90	84.34
-1	10	80	12.05	96.39
0	3	83	3.61	100.00

Figure B15. Frequency of Discounts for 57-lb. Test Weight in HRS Wheat Among Selected Country Elevators in North Dakota



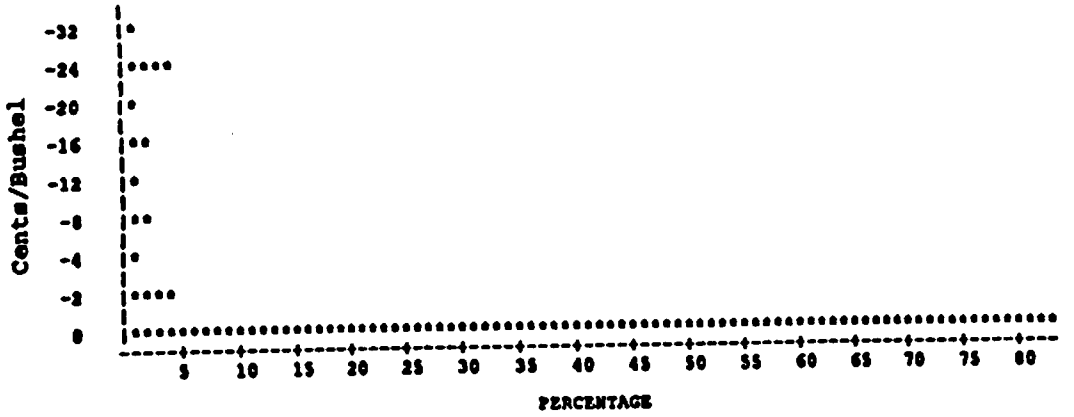
	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
-15	1	1	1.20	1.20
-12	1	2	1.20	2.41
-11	1	3	1.20	3.61
-10	8	11	9.64	13.25
-8	9	20	10.84	24.10
-7	1	21	1.20	25.30
-6	8	29	9.64	34.94
-5	11	40	13.25	48.19
-4	11	51	13.25	61.45
-3	2	53	2.41	63.86
-2	11	64	13.25	77.11
0	19	83	22.89	100.00

Figure B16. Frequency of Discounts for 14.5 Percent Moisture in HRS Wheat



FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
56	56	67.47	67.47
4	60	4.82	72.29
1	61	1.20	73.49
5	66	6.02	79.52
3	69	3.61	83.13
7	76	8.43	91.57
3	79	3.61	95.18
1	80	1.20	96.39
3	83	3.61	100.00

Figure B17. Frequency of Premiums for 16 Percent Protein in HRS Wheat



FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
1	1	1.20	1.20
3	4	3.61	4.82
1	5	1.20	6.02
2	7	2.41	8.43
1	8	1.20	9.64
2	10	2.41	12.05
1	11	1.20	13.25
3	14	3.61	16.87
69	83	83.13	100.00

Figure B18. Frequency of Discounts for 12 Percent Protein in HRS Wheat

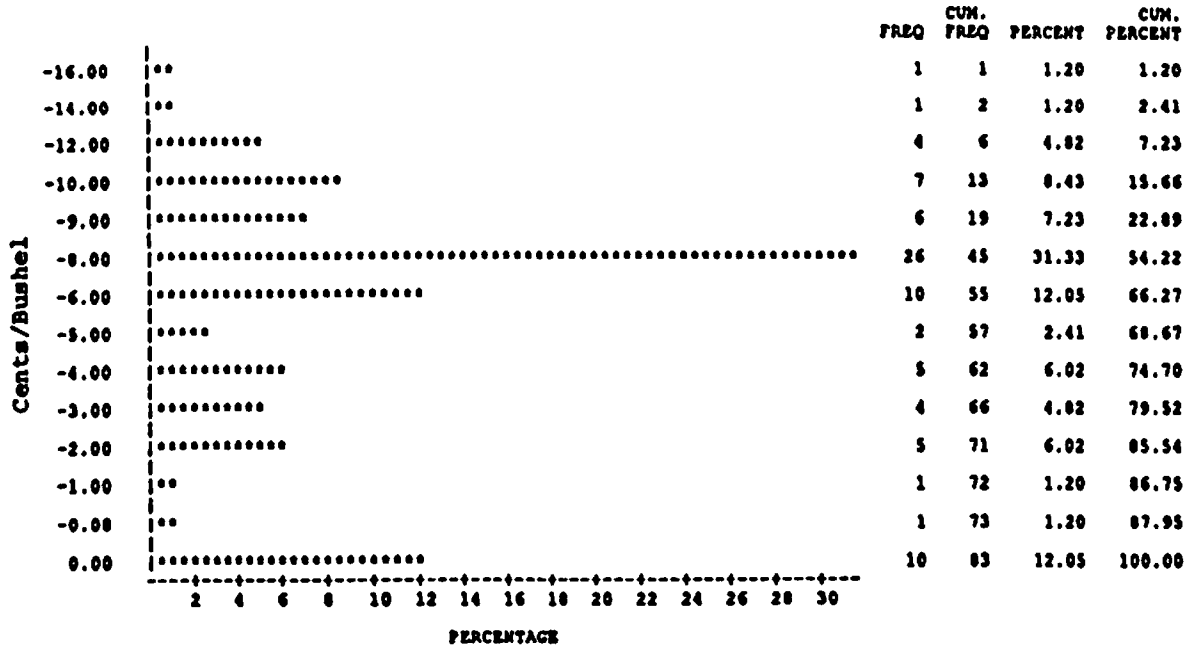


Figure B19. Frequency of Discounts for 4 Percent Total Damage in HRS Wheat

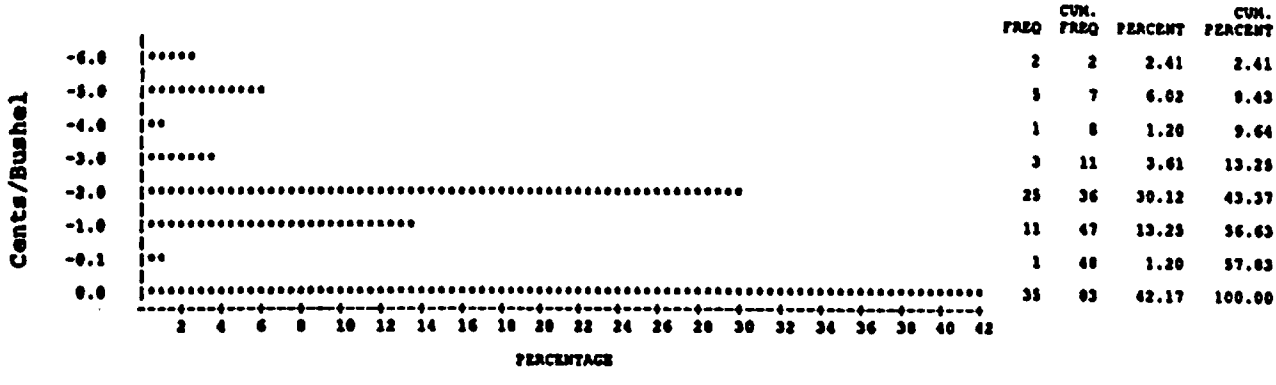


Figure B20. Frequency of Discounts for 1 Percent Foreign Material in HRS Wheat

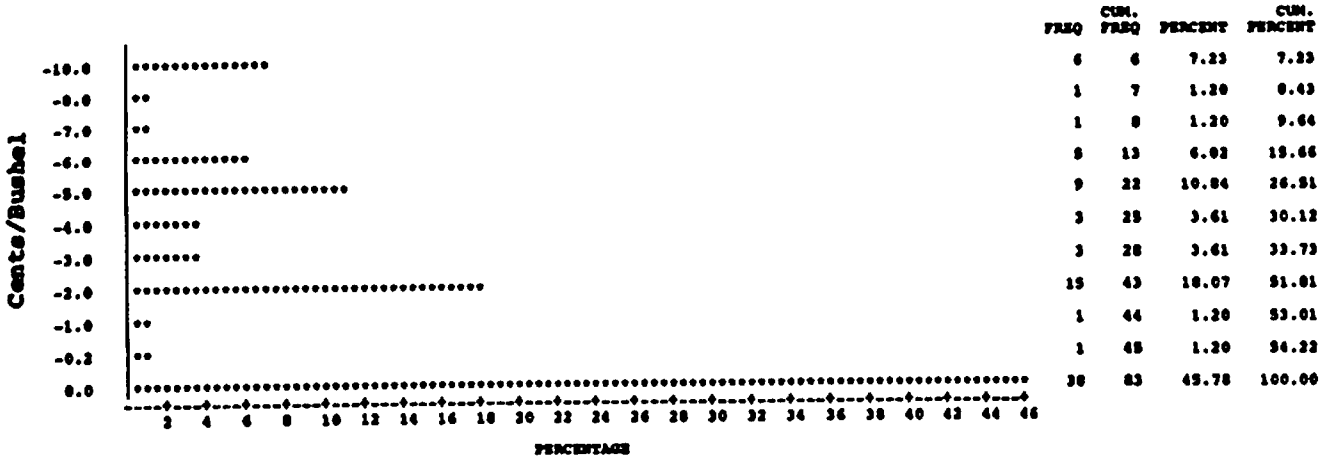


Figure B21. Frequency of Discounts for 5 Percent Shrunken and Broken Kernels in HRS Wheat

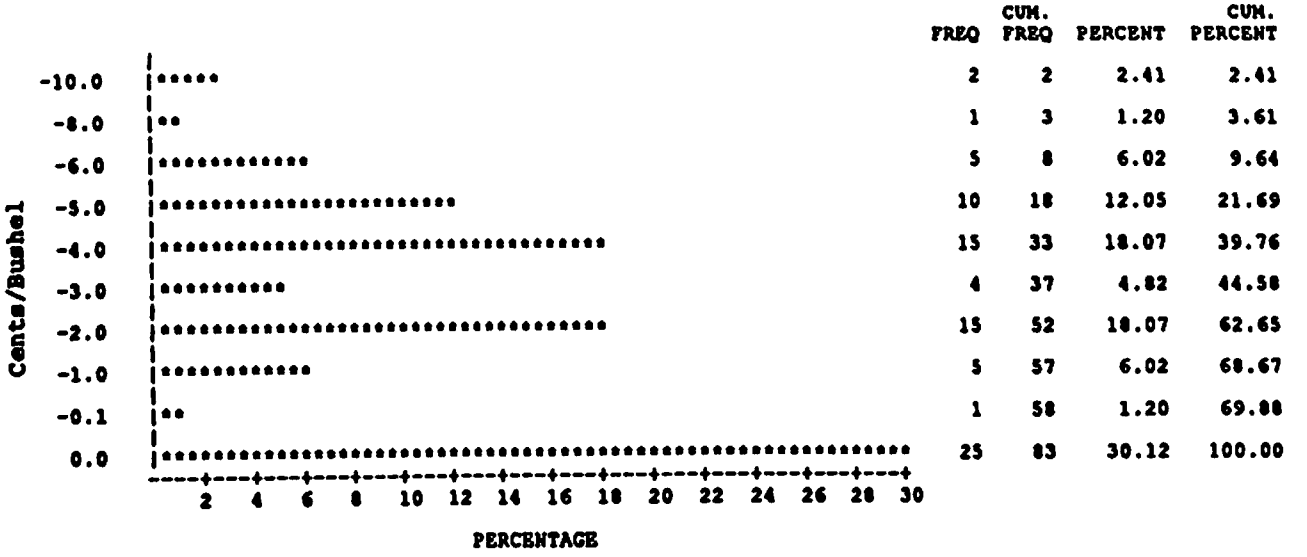
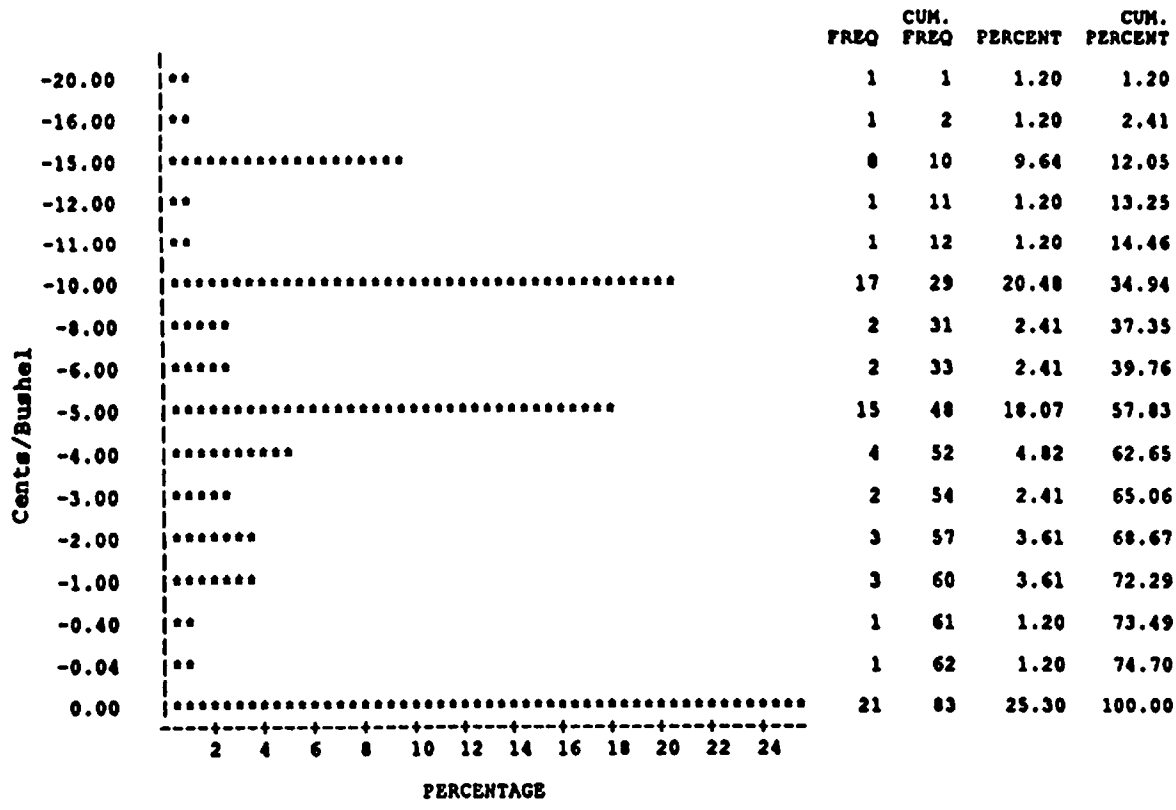


Figure B22. Frequency of Discounts for 2 Percent Contrasting Classes in HRS Wheat



	FREQ	CUM. FREQ	PERCENT	CUM. PERCENT
-20.00	1	1	1.20	1.20
-16.00	1	2	1.20	2.41
-15.00	8	10	9.64	12.05
-12.00	1	11	1.20	13.25
-11.00	1	12	1.20	14.46
-10.00	17	29	20.48	34.94
-8.00	2	31	2.41	37.35
-6.00	2	33	2.41	39.76
-5.00	15	48	18.07	57.83
-4.00	4	52	4.82	62.65
-3.00	2	54	2.41	65.06
-2.00	3	57	3.61	68.67
-1.00	3	60	3.61	72.29
-0.40	1	61	1.20	73.49
-0.04	1	62	1.20	74.70
0.00	21	83	25.30	100.00

Figure B23. Frequency of Discounts for 5 Percent Wheat of Other Classes in HRS Wheat

Appendix C

GRAIN MARKETING QUESTIONNAIRE

(Fall 1991)

1. Name of firm _____

2. Location of firm _____

3. a. 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 _____

   b. This elevator is:
   _____ (a) a single facility (location) elevator
   _____ (b) part of a multi-facility (location) elevator

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. How do you dispose of most of your screenings (check one):

_____ sold to feed market
_____ used in your own feed mill
_____ disposed as waste
_____ other

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

15. What was your board price for #1 Hard Amber Durum (milling) on January 16, 1992? _____

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 (-)	
Monroe	_____¢/Bu.
Medora	_____¢/Bu.
Renville	_____¢/Bu.
Other varieties	_____¢/Bu.
j. Other_____	_____¢/Bu.

17. What was your board price for #1 DNS 14% protein on January 16, 1992? _____

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 last year's report? ____Yes ____No

20. Would you like a copy of this year's report? ____Yes ____No